

1999

A framework for improving the implementation of process based change

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<http://hdl.handle.net/10026.1/843>

<http://dx.doi.org/10.24382/3455>

University of Plymouth

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**A FRAMEWORK FOR IMPROVING THE IMPLEMENTATION OF
PROCESS BASED CHANGE**

By

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**A thesis submitted to the University of Plymouth in partial fulfillment for
the degree of**

DOCTOR OF PHILOSOPHY

Manufacturing and Business Systems Group

Department of Computing

In collaboration with

IBM UK Ltd.

October 1999

Abstract

This thesis is located within the field of Information Systems implementation. More specifically it focuses within Information Systems at the issues associated with implementation of business process-based change.

There is much evidence, both theoretical and empirical, to suggest that there are a high percentage of Information Systems and Business Process implementation failures (Meredith 1981, Lucas 1981, Walsham 1993, Land et al 1989). The aim of this thesis is twofold. Firstly to analyse the reasons behind the failures in process-based change implementations and secondly to provide a solution that will enable companies to overcome some of the problems and thus reduce the number of these failures.

This research is based on a joint project between IBM PSS and the University of Plymouth. The research focuses specifically on the implementation of process-based change occurring in IBM Product Support Services (PSS). PSS is primarily responsible for the maintenance of IBM and non-IBM hardware and software and the selling of services associated with them.

In order to understand what happens during implementation the researcher participated in three action research projects. All three projects were part of an IBM world-wide Business Process Re-engineering project called Customer Relationship Management. To ensure the validity of this action research process the researcher has closely followed the guidance compiled by Eden and Huxham.

This research will present a framework that has been developed to improve the management of implementation projects. The framework is based on a synthesis of theoretical evidence and empirical findings. The empirical findings have been developed from investigating the reasons for failure in the three action research projects. All findings were analysed using the 'Grounded Theory' approach.

The framework consists of five dominant themes, which are senior management commitment, analysis of problem situation, project planning and management, process focus and user involvement. It has not become apparent from the research that one factor is more important than another. In the researchers view the problem of unsuccessful implementation is a complex one which may only begin to be improved when all the themes are addressed together as a whole.

In order to test the themes of the framework a process for application was required. The process developed for using the framework involves applying a focus group at project initiation and questionnaires throughout the course of the project. The purpose of the focus group is to understand the themes of the framework within the context of the particular problem situation being investigated. The questionnaire is used to audit each theme of the framework to identify potential areas of implementation weakness. T-test analysis is carried out on the questionnaire results to measure whether any changes between questionnaires results are statistically significant.

The framework was successfully applied to a fourth project. The t-test results indicated that applying the framework to the project throughout the course of the implementation had significantly improved the implementation. The originality of this research is in the framework and its application.

This thesis will describe the history of implementation successes and failures at IBM, survey appropriate implementation theory and describe the synthesis and testing of the framework.

Acknowledgments

Over the past three years I have been helped and supported by many individuals; too many to mention all by name. Firstly I would like to thank my supervisors, Dr Roger Maull and Dr Steve Childe. I could not have done this without your combination of confusion and enlightenment.

Other individuals I would like to express my appreciation to are my university colleagues, Dr Andi Smart, Dr Tammi Greswell, Dr Paul Brown and the rest of the MABS team. Your advice, knowledge and help has been invaluable.

I would also like to offer my thanks to my friends and colleagues at IBM PSS who have assisted me throughout my research. In particular I would like to express my gratitude to the 'team', Dave Scarbrow, Andy Sims, Jim Stevenson, Vaughn Wiles, Peter Green, Neil Corder and Kevin McGeough. In addition I would also like to thank my managers Peter Holland, Chris Buckland and Alex Parsons.

Most importantly I am extremely grateful to my grandfather for his tireless correcting and proof reading and my parents and brother for their support. Finally, I would like to thank my friends and especially house mates for their encouragement throughout my PhD highs and lows.

Thank you all very much.

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Author's Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award.

This study was financed with the aid of a studentship from the EPSRC (Engineering and Physical Science Research Council) and carried out in collaboration with IBM UK Ltd. The research has been undertaken whilst the researcher was based full time at IBM. In parallel the author was also a member of the Manufacturing and Business Systems (MABS) team at the University of Plymouth and regularly attended research workshops.

Although the author has worked as part of several teams during her employment at IBM the research described in this thesis is the result of work undertaken solely by the researcher.

A programme of advanced study was undertaken that included IBM training in Facilitation Skills, Advanced Facilitation Skills, Negotiation and Influencing Skills, Advanced Negotiation and Influencing Skills, Coaching Skills, Project Management I, Project Management II - Project Definition Workshops, Managing Change, Consultancy Skills I, Business Improvement Through People, Benchmarking, Team Advisor Training.

Relevant business and technology conferences were regularly attended and research presented. Conferences include, Business Information Technology Conference (BIT), November 1997 and 1998, European Operations Management Association (EurOMA), June 1998 and British Academy of Management Conference (BAM), September 1998. The papers presented at these conferences were:

Nash Z, Childe S, Maull R. 1997. Implementation of Process Based Change. In R Hackney (editor) proceeding of the Business Information Management Alternative Futures Conference. The Manchester Metropolitan University.

Greswell T, Maull R, Childe S, Nash Z. 1998. A Soft Systems Approach to the Formulation of a Manufacturing Strategy. In P Coughlan, T Dromgoole, J Peppard (editors) proceeding of the European Operations Management Association Conference, June 14-17th. Trinity College, University of Dublin.

Nash Z, Childe S, Maull R. 1998. Improving the Implementation of Process Based Change at IBM. In Proceeding of the British Academy of Management Annual Conference, September, pp116-117. NU Printers, The University of Nottingham.

Nash Z, Childe S. 1998. A Framework for Implementation Success. In: R Hackney (editor) Proceedings of the Business Information Management Adaptive Futures Conference. The Manchester Metropolitan University.

Maull R, Nash Z, Childe S. 1999. Improving Project Implementation at IBM. Presented at the International Service Operation Management Association (SOMA) Conference, August 22nd-25th. Bentley College Waltham, MA, USA.

Journal publications include:

Nash Z, Childe S, Maull R. 2000. Factors affecting the implementation of process based change. To be published in International Journal of Entrepreneurship and Innovation Management (IJEIM) Vol 1, No.3, 2000.

Workshops and seminars attended include; the 'Research Methods' workshop at Cambridge University, March 1997 funded by the EPSRC, 'Soft Systems Methodology' Workshop, University of Central Lancashire, August 1997, 'Teamworking' workshop, Sheffield Hallam University, 1996, the 'UK Academy of Information Systems (UKAIS) PhD Consortium', June 1998 and essential skills for management research 'Grounded Theory' workshop, Cranfield School of Management, October 1998.

Signed.....

Date.....22-11-99.....

Chapter 1

Introduction

There is much evidence, both theoretical and empirical, to suggest that there are a high percentage of Information System (IS) implementation failures (Meredith 1981, Lucas 1981, Walsham 1993, Land et al. 1989, Ewusi-Mensah and Przasnyski, 1994, Lyytinen and Hirschheim, 1987). In spite of the 'enormous progress and strides made in the development, implementation and usage of IS' (Ewusi-Mensah and Przasnyski, 1994) the failure of IS in organisations still continues. The aim of this thesis is to investigate causes of implementation failure and to help overcome the limited success of implementation, specifically process-based change implementations.

IS is a multi-disciplinary subject that has both technological and social underpinnings (Avison 1998). IS draws upon many different disciplines; such as sociology, anthropology, semiotics, linguistics and psychology (Stowell and Mingers 1997). Process-based change can be categorised as a sub-set of IS; for example a survey reported by Galliers (1997) placed process-based redesign as the third most important information system management issue in the UK in 1997. In another study Checkland & Holwell (1998) reported that in 1996 process-based redesign was the second most significant IS topic for practitioners.

To investigate the limited success of process-based change implementation a three year collaborative research project between IBM and the University of Plymouth took place. The researcher was based full time in IBM PSS (Product Support Services). PSS is primarily responsible for the maintenance of hardware and software and the selling of services associated with them.

All process-based changes investigated in IBM were components of a world-wide corporate business process re-engineering initiative called Customer Relationship Management (CRM). CRM was a set of business processes that were required to operate a marketing and services company. (Process-based change in IBM was typically referred to as Business Process Re-engineering).

1.1 Implementation

Implementation is a commonly used term in many disciplines. In the context of this research implementation is defined as a complex process 'beginning with the first thought of developing a system and not ending until the user either is satisfied that he is in control of the system or has abandoned the project' (Ginzberg 1979). This definition and others will be discussed in the later chapters.

This research will investigate the factors that encourage or inhibit implementation. Considering implementation from Ginzberg's perspective is useful as it allows the investigation of all factors that may affect implementation.

1.2 Previous Implementation Research

This research is based on the premise heavily supported through the literature that implementation is failing more than it is being successful. For example Meredith (1981) has noted in that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Seventeen years on from Meredith's article there is still much literature reporting on implementation issues.

Throughout the 90's, organisational performance improvements through process-based change, (typically referred to as business process re-engineering) has increased in

popularity. There has been an considerable amount of literature generated in connection with reports of unsuccessful process-based change project implementation (for example Bashein et al, 1994, Hall et al, 1993, Guimaraes, 1997, Peltu et al 1996). Hammer estimated that 'between 50 and 70 percent of re-engineering efforts were not successful in achieving the desired breakthrough performance' (1995).

Implementation failures are still occurring and being reported in the literature, particularly in the area of process-change. This implies that there are still many implementation aspects, problems and issues that have not yet been fully examined and solved. In support of this view Sabherwal and Robey (1993) state knowledge about information systems implementation is 'analogous to cooking with a list of ingredients but without the recipe. We need more research on how the ingredients are combined before a recipe for successful implementation can be prescribed'.

1.3 Research Questions

The previous implementation literature illustrates that there are still implementation project failures and that there is a lack of understanding about the area of implementation. In order to direct and focus the area of implementation that will be researched two research questions were developed.

What are the factors that affect the implementation of process-based change projects?

How can we develop an improved process for implementing process-based change projects?

The first research question is concerned with looking at the factors that inhibit and encourage implementation. The second question directs research towards developing a process for managing implementation projects.

1.4 Research Method

A research method appropriate for answering the research questions was chosen. One of the main concerns was that the chosen method must have academic rigour and industrial relevance. As will be discussed later in Chapter Four, current research methods have been criticised for their lack of industrial relevance and inappropriateness for answering the practical problems that managers in industry face (Meredith et al 1989, Susman and Evered 1978, Galliers and Land 1987).

A research method that is becoming increasingly important for helping to solve business and management problems is action research (Meredith et al 1989, Gill and Johnson 1997, Lyytinen and Hirschheim 1987). Action research involves the researcher being closely involved in the organisational change under investigation. This research method is also

particularly appropriate as it is useful for researching in the field of information systems (Wood-Harper et al 1993, Baskerville and Wood-Harper 1998).

To ensure the validity of the action research process the researcher has closely followed the framework compiled by Eden and Huxham. This framework must be closely followed if action research is to be viewed as 'quality research' (Eden and Huxham 1996).

1.4.1 Action Research

In order to understand what happens in an organisation when implementing process-based change the researcher worked full time on three action research projects in IBM PSS. Each of the action research process-based change projects investigated for this research was a CRM related project.

The first action research project was a process identification and problem resolution project based in IBM's Customer Support Services. The second project was about implementing a teamworking culture across PSS. The third action research project was a project to redesign service development process.

The main output from this research is a framework to improve the management of process-based change implementation projects. This framework has been developed from analysis of theoretical data gathered from literature reviews and empirical data. A 'grounded theory' (Glaser and Strauss, 1967) approach was used to develop theory from the empirical and theoretical data. The theory that evolved formed the foundation of the implementation framework.

The framework was tested and on a fourth action research project. Remedial actions were taken during the course of the project as a consequence of applying the framework. These

actions improved the implementation of the process change. The framework was refined as necessary during the project.

1.5 Process-Based Change

Typically process-based change involves activities that are 'interdependent, interactive and boundary-crossing' and include tasks, roles, people, departments and functions (Earl 1994). CRM processes were defined as 'a series of definable, repeatable and measurable tasks that were deployed to consistently deliver the outputs required by the customer' (IBM, 1995). The CRM process included all activities, from noticing an opportunity, through to delivery of the service and review and feedback of the service provided.

The CRM process was described as having three key elements:

- **A new way of going to market.** IBM's new way of going to market tailors market strategy to customer needs and wants. There are three broad product and service offerings of 'off-the-rack', 'mass customised' (pre-packaged solution that can be tailored) and 'one-of-a-kind'.
- **Re-engineering key processes.** Re-engineered key processes and information systems underpin the marketing strategies. The processes are supported by an 'information warehouse' that enables IBM employees all over the world to share the same information.
- **A new way of working.** Implementing CRM involves a completely new way of working where information, solutions and resources can be shared across functions and geographical borders. (IBM EMEA, 1995). In addition changing to consistent world-wide processes will 'enable international teamwork across all IBM organisational units', shared responsibilities and new roles that match new processes (IBM, 1995).

The objective of CRM was to deliver a set of common world-wide processes and tools.

The specific goals of CRM were to:

- Increase customer satisfaction by delivering a quality service that was of value to IBM's customers.
- Reduce expenses by maximum utilisation of global resources.
- Eliminate unnecessary duplication and bureaucracy.
- Increase employee morale by effective and efficient use of skills and resources to deliver services and solutions that are required.

1.5.1 A Process as a System

IBM describe a process as 'a series of definable, repeatable and measurable tasks that are deployed to consistently deliver the outputs required by the customer' (IBM, 1995). The researcher expands on this description of a process. In addition the researcher takes the view supported by Earl (1994), Smart et al (1996), Childe et al (1995) and Weaver (1995), that the concept of a process can be grounded in systems theory. Systems theory is a collection of concepts that may be used for identifying a whole object, such as an organisation, project or a process. Once the system is identified the systems approach can be used as a method of addressing problems in that system.

'System' is an abstract idea. Checkland (1981) describes a system as 'a set of elements connected together which form a whole, thus showing properties that are properties of the whole, rather than properties of its component parts'. Systems thinking is based on four ideas of emergence and hierarchy and communication and control (Checkland, 1981). Emergence refers to the idea that a system 'may have properties which refer to the whole and are meaningless in terms of the parts which make up the whole' (Checkland and Scholes 1990). Hierarchy is concerned with the fact that systems exist in layers where

each system is composed of lower level systems and is itself part of a higher level system (Weaver, 1995). Control enables a system to take actions to 'adapt in response to shocks from the environment' (Checkland and Scholes 1990). Communication enables maintenance of the systems hierarchy by facilitating information exchange between the whole its parts and its environment (Checkland 1981).

Checkland defined four types of systems, natural systems, designed physical systems, designed abstract systems and human activity systems. The most appropriate type of system to the research is the human activity system (HAS). A HAS is defined as 'a set of human activities, linked together so that the whole constitutes purposeful activity' (Checkland 1981); such as, a rugby team or a company. HAS are appropriate as they acknowledge the importance of people in organisations. HAS also acknowledges the fact that different people in a system or process will have different attitudes, behaviours, beliefs, perceptions and world views (Weltanschauung) all of which have to be taken into account in order to gain a full understanding of the situation.

Earl (1994) states that processes have 'inputs, processing and outputs' and are made up of a hierarchy of sub-processes similar to a system that has sub systems. Systems disciplines can be used to illustrate a number of important ideas about processes. Checkland (1981) describes a human activity system as having nine characteristics. Summarising Checkland (1981) and substituting a process for a system (as suggested by Weaver, 1995) the nine characteristics of a process are:

1. A process has a purpose.
2. A process has a measure of performance.
3. A process contains a decision-taking process that allows the process to adapt to meet its purpose and performance measures.

4. A process has characteristics that have all nine characteristics themselves.
5. A process has characteristics that interact and show connectivity such that effects and actions can be transmitted through the system.
6. A process exists in wider processes and/or environments with which it interacts.
7. A process has a boundary separating it from other process and its environment. The boundary is defined by the area within which the decision-taking process has power to cause action to be taken.
8. A process has physical and abstract (human knowledge) resources that are at the disposal of the decision-taking process.
9. A process has a guarantee of continuity and can recover stability after disturbance.

These characteristics will be used as a guide to focus this research on process-based change projects.

1.6 Unit of Analysis

The area of concern under research is the implementation of process-based change. In order to define what is within and what is outside the research some boundaries need to be placed around the areas of study.

Increasingly, product innovation and incremental organisational change initiatives (such as the process-based change being researched in IBM) are being conceived and managed as projects (Partington 1996). A project is a useful and appropriate unit of analysis as it provides a boundary to each process-based change under investigation.

Meredith and Mantel (1989) define a project as 'usually a one-time activity with a well defined set of desired end results. It can be divided into sub-tasks that must be accomplished in order to achieve the project goals.' Haynes (1991) also provides a helpful definition of a project as a 'finite-term activity carried out within specified limits of cost, time, and quality.' Haynes's definition refers to three common measurements that are often applied to projects in order to measure their success; costs, quality or performance levels and timescales.

Lock (1996) discusses the fact that no two projects are exactly the same. Each project has individual characteristics and consists of different factors. At IBM a project typically has these features.

- A project team is usually formed to carry out the project. The co-ordinating project team is usually called the steering committee. The steering committee members usually consist of a representative from each part of the business that will be affected by the project to be implemented. Projects normally have a sponsor from top management.

Many of the project teams have a project manager to monitor the meeting process.

- At IBM, a Project Definition Workshop (PDW) is usually held at the outset of a project. Details that are discussed at these workshops include, project goals, objectives, major milestones and deliverables, sub-projects, risks, assumptions and dependencies.
- At IBM, a Project Definition Report (PDR) is produced from the output of the PDW.
- The majority of the projects involve at a minimum technology and people issues therefore projects are usually characterised by differing views and objectives which have to be considered and satisfied.
- The project work is completed by the project team and for larger projects there may be sub project teams working with the steering committee.
- As with Meredith's definition the projects are commonly managed by dividing work into sub projects. Each sub project is given an owner who holds the responsibility for completing the project.
- A project is managed by setting major milestones that lead to sub project completion. Actions are set that lead to milestone completion.
- The projects are characterised by holding regular team meetings to check the actions are being met.

1.7 Contribution of the Research

The initial theoretical and empirical evidence suggests that implementation of process-based change is not always successful. The aim of this research is to develop one possible solution to reduce the number of these failures and 'manage the implementation of process-based changes'. By concentrating action research on the area delimited by the research questions the contribution to knowledge will include:

- Identification of factors that affect the implementation of process-based change.
- Development of a framework that practitioner's could follow to improve the management of implementation of process-based change.

The factors that affect implementation will be identified from the outcomes and findings of the action research projects. This data in addition to findings from the focus groups and semi-structured interviews will undergo a rigorous process of analysis. A grounded theory approach will be used to analyse and code the data.

The most significant factors that evolve from the process of analysis will form the basis of the framework for improving implementation. Applying the framework to a fourth action research project will assess the usefulness of this framework.

The originality of the research is twofold. The first element of originality is in the dominant factors affecting implementation that were uncovered using a 'grounded theory' process of analysis. The second element of originality is the development of a process for using the implementation framework that manages the implementation of process-based change. The framework process includes application of a focus group and questionnaire

that are used to manage the complete process of implementation. An important aspect of the framework process is that it leads to an understanding of the factors that affect implementation within the context of the particular change. The process also ensures the focus on these factors is maintained throughout the complete implementation project. The process for using the framework offers a 'holistic' approach to managing the factors that affect implementation where the factors that affect implementation are considered together throughout the implementation.

1.8 Structure of Thesis

This thesis is divided into twelve chapters. A brief outline of each chapter is presented below.

Chapter 1 introduces the area of research and sets the boundaries of the research. The research question and research method used to answer these questions are summarised. Finally the contribution this research makes to existing knowledge is presented.

Chapter 2 presents the first half of the implementation literature review. The chapter discusses the typical implementation theories and concepts that are found in the literature. The factors that affect implementation are then identified and explored in some detail.

Chapter 3 concludes the literature review by examining the development of implementation processes over time. Several processes are explored and their strengths and weaknesses highlighted.

Chapter 4 explains the ontological and epistemological underpinnings of the research. The research method 'action research' is defined and a framework to ensure its validity is presented.

Chapters 5, 6 & 7 each provide a summary of an action research project. The results, outcomes and findings from the action research projects are described and the factors that affected the implementation are examined.

Chapter 8 outlines the sequence of activities that were followed to analyse the data produced from the outcomes and findings of the projects. Validating qualitative research using triangulation is presented. The process of coding the data to develop theory using 'grounded theory' methods is explained. The chapter concludes with a detailed description of the five dominant themes or categories of factors that developed from the process of analysis.

Chapter 9 presents the implementation framework that has been developed to improve the management of implementation projects. How the framework developed from the five categories of factors that affect implementation is described. The implementation focus group and questionnaire tools that support the framework are explained. The chapter concludes with the presentation of a practitioner's guide to using the process-based change implementation framework.

Chapter 10 describes the first half of the fourth process-based change action research project. The developed implementation framework is tested on this fourth project. The results of applying the framework focus group and questionnaire are described in detail.

Chapter 11 presents the outcome and conclusion of the project. The application and results of the second implementation audit questionnaire are presented. A comparison of the results over time is also put forward. An overview of the results of the project and the factors that affected its implementation conclude this chapter.

Chapter 12 summarises the overall outcomes of the research. The method of research used and views of implementation taken are reflected upon. The contribution to knowledge made by this research is evaluated. Finally, ideas for future research are suggested.

1.9 Summary

This thesis will describe the history of implementation successes and failures at IBM, describe the synthesis of empirical and theoretical data, present the framework that evolved and describe the testing, results and conclusions from the framework. Overall the research aims to improve the understanding of the factors that affect implementation. The research also aims to provide a solution to reduce the number of implementation failures by developing a framework to improve the implementation of process-based change projects.

Chapter 2

A Review of Implementation Theory and Factor Research

The main area of this research is 'implementation'. Implementation is a complex concept that is found in many different disciplines, such as management science, manufacturing operations, operations research (OR), information systems (IS) social science and information technology (IT).

Several key writers on the problem of implementation (Lucas 1981, Swanson 1988, Lucas et al. 1990) have divided implementation research into three categories; implementation theories, 'factor' and 'process' research. Factor research is about the different variables that influence implementation. The 'process' research category is about strategies that could be followed to manage implementation.

This review follows a similar format to that of Lucas (1981) and Lucas et al (1990). The first half of this chapter will summarise the implementation theories and concepts typically found in the literature. The latter half of the chapter will summarise the factors affecting implementation that are reported in the literature.

2.1 Implementation Theories

Research into the field of implementation is relatively recent (Kwon & Zmud 1987). A Churchman and Schainblatt (1965) article about 'mutual understanding' is widely cited as one of the first on the subject of implementation. The paper considered the level of understanding that is required between the manager or users of the system and the operations researcher or information systems developer. It did not conclude whether a mutual understanding between the two parties was necessary for successful implementation. However, the article was sufficiently inspiring for a complete issue of *Management Science* (Vol.12, no.2) to be dedicated to responses debating the subject.

Since this article several authors such as Meredith (1981), Keen (1981), Land et al (1989), Walsham (1993), Ginzberg (1979), Lucas (1981), Kwon & Zmud (1987), Swanson (1988), Schultz et al (1984) have continued to discuss the problems surrounding implementation. Meredith noted in 1981 that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Seventeen years on from Meredith's article there is still much literature reporting on implementation issues. Indeed Lucas et al (1990) states that 'the implementation of systems remains a significant issue. A number of systems are under-utilised, do not meet their potential, or fail to be used at all.'

It is useful to consider different authors' views and definitions of implementation. Much of the traditional implementation literature discusses technical implementation of computer systems, where 'many authors refer to implementation only as the final stage in the system's life cycle' (Lucas 1981) following stages such as analysis and design.

2.1.1 Traditional View of Implementation

The systems life cycle (SLC) or systems development life cycle (SDLC) is a model used to

identify stages in the development of a system; typically a computer system. The SLC is a linear process consisting of a series of consecutive stages. Each stage must be completed in full before moving on to the next. Typically, stages of feasibility, analysis, design, implementation and maintenance are included in the SDLC, although opinion differs.

Generally, the first stages of this model are concerned with making an assessment of the financial, technical and social feasibility of carrying out the proposed project. The analysis stage aims to collect information about the existing system, identifying the current system problems, making specifications of the requirements of the new system and describing what the system will do. The design stage of the SLC describes how the system will work. It has the objectives of specifying the exact technical requirements and producing a design specification. The implementation stage usually includes systems programming and testing, user training and the physical change from the old to the new system, which may include pilots and parallel installation. The final maintenance stage aims to put right the systems errors found once the system has been implemented and also to keep the system up to date with changing requirements. The SLC may eventually be repeated, when the system requires further development.

The traditional view of implementation is more synonymous with installation of a system, which Meredith (1981) describes as 'the physical placement of a system into an organisation, including a checkout of its function to see that it is operating as designed.'

2.1.2 'Wider' View of Implementation

Lucas (1981) puts forward an alternative approach to implementation as one of the final stages of systems development. This view describes implementation as 'an on-going process which includes the entire development of the system from the original suggestion through the feasibility study, systems analysis and design, programming, training, conversion, and installation of the system'. Authors such as Ginzberg (1979) and Swanson (1988) hold this wider view of implementation.

Ginzberg (1979) defines this view of implementation as 'beginning with the first thought of developing a system, and not ending until the user either is satisfied that he is in control of the system or has abandoned the project.' Childe (1997) provides a comprehensive definition of implementation as, 'Implementation involves managing the expectations and activities of people which cannot be so simply understood and managed. Implementation is not complete until the system is brought into full use to the point when the company begins to benefit from it, although the success of the implementation may depend upon all the stages from the initial concept of the system onwards.' This definition is useful, as it demonstrates that successful implementation may depend on the success of all the previous stages of the life cycle.

The wider view of implementation is useful as it encompasses the traditional view of implementation. The traditional view of implementation (illustrated in figure 1) only considers factors that affect implementation during the installation of the computer system. User involvement includes the further consideration of how users may be involved or affected by the implementation. It is only the wider view of implementation that considers all factors that may affect implementation, such as organisational culture, the organisation's systems and processes and different employee's perspectives and ideas.

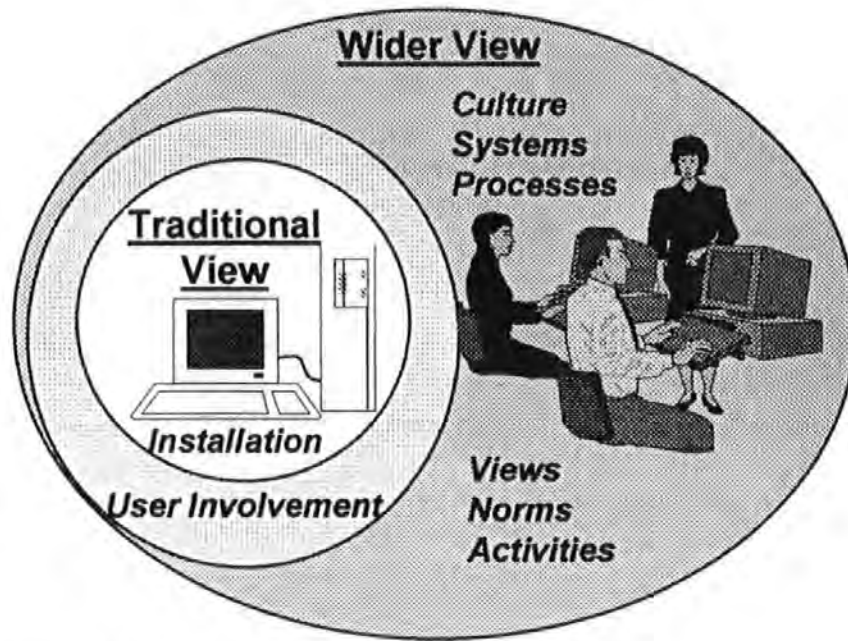


Figure 1: Views of Implementation

This wider view of implementation is more complex than this view which sees implementation as a final stage of the SLC. It is an 'organisational implementation' that 'involves a process of social change over the whole time from system conceptualisation to post-implementation' (Walsham 1993). Implementation is considered as beginning when the idea of the change is conceived and concluded when the change is complete. A change is completely implemented when the new system has been accepted and is being used by its users; is producing the benefits that were predicted and the planned change has been brought about. It is this wider view of implementation that is being taken for this research.

2.1.3 Implementation as a Process of Change

'Management science implementation should be viewed as a process of organisational change' (Ginzberg 1979). Considering implementation as a process of change is useful; it will allow the investigation of all factors that may influence success of implementation, irrespective of what point they may occur in the process of change. Events that may be crucial to successful implementation may occur at any stage of the project, including after the system has been installed. Indeed Ginzberg (1979) states that 'any narrower definition of the boundaries of implementation will lead us to ignore events that are critical to the process and its ultimate outcome.'

In addition, Ginzberg (1979) states that the 'process of change' view of implementation is useful, as it takes account of the fact that implementation takes place over a 'considerable period of time'. He also notes that this view has strong theoretical underpinnings from management, social and organisational science. Implementation will be viewed as a process of change throughout this research.

2.1.4 Successful Implementation

The success of implementation can be measured in various ways. In fact, Delone and McLean (1992) concluded from their review of literature on IS success measures that 'there are nearly as many measures of success as there are studies'. The authors also divided measures of success into six interrelated and interdependent categories of system quality, information quality, use, user satisfaction, individual impact and organisational impact.

Lucas et al (1990) suggests that successful implementation of IS may be measured by:

- Use of systems, measured by the level of intended or actual use

- User satisfaction with system or outcomes of system
- Favourable user attitude towards system
- Degree to which system accomplishes its objectives
- Payoff to organisation

Alternatively Walsham (1993) says that measuring implementation can be 'problematic'. Measures that he puts forward include meeting strategic objectives, high levels of system use, effectiveness in use in terms of supporting particular organisational activities or areas and expressed satisfaction of stakeholder groups (such as system users). Smith and Tranfield (1987) also provide suggestions for division of successful implementation into four categories of:

- Business validity; such as was it worth it? - exploitation problem
- Technical validity; such as did it work? - installation problem
- Organisational validity; such as was the organisation designed or redesigned in both structural and cultural terms to deliver the benefits? - change problem.
- User validity, such as did those who operate the system use it, have the skills to use it, and feel comfortable using it? - introduction problem

Lucas (1981) recommends that where a system's use is voluntary, then user satisfaction is a useful measure and where enforced, level of use could be an appropriate measure.

Successful implementation for the purpose of this research will refer to complete implementation, from conception of the idea to full installation and acceptance. In particular the focus will be on user acceptance and use of the new system (Smith and Tranfield's (1987) fourth point). Business benefit that had been predicted from the implementation, compared with actual benefits produced will also be measured where possible; for example improvements in process cycle time. Another measure of success

that will be applied is whether the project has met its original objectives. Whether the project has met these criteria for success will be 'judged by the people in the situation' (Checkland & Holwell, 1998) and the researcher.

2.2 Factors Affecting Implementation

Some of the most comprehensive collections of work on implementation have been found in work by Lucas (1981), Swanson (1988), Schultz et al (1984) Lucas et al (1990), Kwon & Zmud (1987) and Walsham (1993). These texts are relevant and useful as implementation is referred to in its wider context. In addition, these texts refer to implementation of information systems, information technology and organisational change, which are all relevant areas of concern for this research.

Some implementation theories have been discussed above, such as the comparison of traditional and wider views of implementation and what is meant by successful implementation. Another common area of discussion in the implementation literature concerns the factors that affect implementation. Implementation factors are variables that should be taken into account when implementing a change or may be 'factors that are associated with implementation success' (Lucas et al 1990). Several writers on implementation have discussed the factors that affect implementation. Eight authors' collections of factors which have been cited as encouraging or inhibiting implementation are summarised in table 1.

Factors	Explanation
Meredith 1981	OR/MS factors affecting implementation
<ul style="list-style-type: none"> • Technical • Process • Inner-Environmental 	<ul style="list-style-type: none"> • Training, project team ability and data accuracy. • User involvement, top management support, systems advocate role and systems fit with organisation and personal goals • Importance of system to organisation and organisations willingness to change
Lucas 1981	Five factor affecting IS implementation
<ul style="list-style-type: none"> • Technical system quality • Client actions • Attitudes • Decision style • Personal and situational variables 	<ul style="list-style-type: none"> • Hardware and software attributes • Management support • User attitudes affect on system usage. • Different ways to approach a problem. • Human aspects that affect implementation
Kwon & Zmud 1987	Implementation Process
<ul style="list-style-type: none"> • Individual Factors • Structural Factors • Technological Factors • Task -Related Factors • Environmental Factors 	<ul style="list-style-type: none"> • Job tenure (institutional legitimacy), cosmopolitanism (receptivity to change), education, role involvement • Specialisation, centralisation (degree of concentration of decision making activity), formalisation (degree of functional differentiation), informal network (interpersonal, informal communications among adopters). • IS compatibility with adopting organisation, relative advantage chosen IS is perceived to have over other systems, complexity of IS to understand, • Amount of task uncertainty, degree of autonomy individuals have over their tasks, responsibility, variety, identity with tasks, existence of feedback mechanisms. • Heterogeneity (similarity of environmental entities the organisation interacts with, uncertainty of organisational environment, competition, how resources are spread through out the environment, extent of inter-organisational dependence (sharing of resources or ideas between organisations).
Lyytinen & Hirschheim 1987	Reasons for IS failure
<ul style="list-style-type: none"> • Technical & operational reasons • IS environment • Information systems development 	<ul style="list-style-type: none"> • Hardware or software related features. • Lack of understanding of the individual, organisation and the environment. • Lack of attention to, development methods, decision making, nature of work, contingencies, organisational implementation and systems assumptions
Swanson 1988	Nine themes of IS implementation failure
<ul style="list-style-type: none"> • Management commitment • User involvement • Value basis • Mutual understanding • Design quality • Performance level • Project Management 	<ul style="list-style-type: none"> • Top down support for the IS. • User involvement in the design process • Understanding the value of the IS to the organisation • Understanding between the user and IS provider • Is it adaptable • Are expectations met • Time period and budget planned for project

<ul style="list-style-type: none"> • Resource adequacy • Situation Stability 	<ul style="list-style-type: none"> • Availability of personnel, equipment and data • Organisational disruption e.g. IS developer leaving
Land et al 1989	Six IS implementation inhibitors
<ul style="list-style-type: none"> • Motivation for installing IS • Commitment to IS • Organisational culture and management • Nature of implementation process • Organisations familiarity and experience with standard ways of working • Technical factors 	<ul style="list-style-type: none"> • Having clear reasons for wanting the installation • Support and involvement of senior management. Having a champion of the project and commitment from all levels of employees. • Organisational culture and management style should be accepting of technological change. • An implementation plan should be developed to include training. • Prior experience in set ways of working encourages implementation • Performance level affects user acceptance of the system. Less complex systems may be more easily accepted
Grover et al 1995	Reengineering Implementation Problems
<ul style="list-style-type: none"> • Change management • Technological competence • Strategic planning • Time frame • Management support • Human resource • Process delineation • Project management • Tactical planning 	<ul style="list-style-type: none"> • Provision of communication and education to motivate employees. Changes in organisational structure, roles and responsibilities and shared values. • The ability of technology to enable reengineering • Strategic vision and identification of processes related to strategy • Plan and monitor implementation • Senior management support and leadership. Provision of project champion. • Provision of training and process linked management system • Involvement of process owners, establishing performance improvement goals, define process, radical improvements • Appropriate reengineering methodology, project performance measure. • Provision of financial and human resource.
McGolpin & Ward 1997	Factors Influencing the Success of Strategic Information Systems
<ul style="list-style-type: none"> • Planning • Evaluation • Implementation • Benefits Management 	<ul style="list-style-type: none"> • Objective, scope, initiator, integration between IT/IS and business plans, tools/models used to identify IS, approach for developing strategic plan, IS/IT involvement in planning, champion, outputs from planning, method of planning, • Hard or strategic focus on benefits, range of benefits, detail of benefits evaluation, owner of evaluation, when evaluation took place, techniques used to evaluate benefits, extent IT/IS were involved, was the usual approach used • Was the project considered a business change, role of IS/IT senior managers and business, ownership of implementation, approach and tools used, existence of a well understood change process. • Existence of an approach for managing the delivery of business benefits, delivery plan, when benefits were identified, is there clear commitment to achieve benefits

<ul style="list-style-type: none"> • Context 	<p>and accountability and responsibility, were benefits reviewed, were benefits linked to business processes, process for identifying future benefits.</p> <ul style="list-style-type: none"> • Perception of potential of IS/IT, Level of senior IS/IT manager, mandate of IS/IT in organisation, did planning, evaluation or implementation approach change, who drove the change, extent of organisation willingness to invest in benefits, existence of change management methodology.
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Table 1: Factors that Influence Implementation Research

Many authors suggest that implementation failure is caused by ‘social and organisational factors rather than from shortcomings in the technology itself’ (Land et al 1989). In addition, Levy et al (1993) reported that effective implementation should be accompanied by organisational development and change and Bessant (1993) found that ‘several studies have highlighted, there is a clear need for the organisation to change alongside the technology’. Indeed, Ewusi-Mensah and Przasnyski (1994) found that ‘technological issues did not contribute in any significant way to the IS project abandonment decision’. Much implementation literature concentrates on technical aspects that lead to implementation failure, such as limited database infrastructure (Grover et al 1995). It is not the purpose of this research to investigate the technical ‘hard’ issues that affect implementation. The following discussion on the factors that affect implementation will focus on the ‘soft’ social, organisational and human factors that affect implementation.

Table 1 illustrates that there is a multitude of factors that could affect an implementation project. The discussion below attempts to summarise the main areas that are cited in the literature.

2.2.1 Top Management Commitment

Seven out of eight studies reviewed noted senior management commitment as a factor that affects implementation. McGolpin & Ward (1997) by judging on previous work state that 'involvement and support of the senior management' is the most common success factor. Swanson (1988) recognised that gaining management commitment means the implementation has 'top down support' and 'appropriate strategic vision and managerial authority' (Walsham 1993). In addition Bessant (1994) says that 'commitment from senior management should not be confined to building and communicating the vision at the start but should extend to long-term steering and guiding of the programme'. Similarly, Meredith (1981) noted that if senior management could 'devote full attention to the system' implementation success was more likely. Where projects are initiated by senior management the probability of successful implementation is increased further.

In addition to providing support, leadership and commitment to the project Meredith (1981) recommends that in an organisation-wide change effort top management should also be 'actively involved in the changeover.' Management are required to visibly illustrate their commitment, by becoming members of the project team, attending meetings, providing resources or using the system personally (Lucas et al 1990). If a change does not receive this senior support then this may mean the resources required and the attention and time required from those affected and involved may not be provided (Meredith 1981). Senior management also influence implementation success as those affected by the change look to management for 'cues' on how to behave. Where management lacks knowledge or is uninterested in the system then others will follow suit; thus complicating implementation.

The presence of a 'project champion' (Land et al 1989) 'change agent' (Ginzberg 1979) or

'systems champion' (Walsham 1993) has been noted in the literature as having a positive affect on implementation. A 'champion' or 'agent of change' is typically an individual who is highly committed to the project and who has the role of leading the change and encouraging commitment from those involved and affected by the change. Walsham (1993) says the champion may even become a 'moral agent' who confronts and deals with the ethical issues of the change. A change agent could help 'make sure that all issues are out in the open and this should minimise the possibility of misunderstandings' (Ginzberg 1979).

2.2.2 Project Management

Project Management is a popular approach used by organisations in planning and managing organisational change. Lock (1996) provides a very practical straightforward definition of project management as 'the function of evaluating, planning and controlling a project so that it is finished on time, to specification and within budget'. McGolpin & Ward (1997) noted that it was a combination of planning with benefits management that make successful project management and thus implementation more likely. Good benefits management involves identification of the potential benefits to be gained from the planned implementation at the beginning of the project.

Complete project management from conception to completion is often described in stages known as the project life cycle (Buchanan and Boddy 1992, Meredith and Mantel 1989, Bergen 1986). Typically, these stages may include project initiation, project implementation and project termination (Meredith & Mantel 1989). Project initiation usually includes selection of a project manager and project team and initiation of project planning. Project implementation involves handling project budgets and scheduling, monitoring and controlling project activities. The final stage of termination concludes project work with final evaluations. It is possible to divide the project life cycle into more

than three stages; for example (Bergen, 1986) describes the life cycle in eight stages.

Several authors (Partington 1996, Sharad 1986 and Cleland 1991) suggest that it is possible to develop a generic set of project management principles, that can be applied to manage most project implementations, in any type of organisation. These principles are used to manage the progress of a project through its life cycle. Examples of such generic principles are PRINCE, MITP (IBM Consulting Group, 1995) and OSMOSIS project management methodologies.

Where a project implementation is successfully project planned and managed the implementation may have the advantage of being better controlled, having a shorter implementation time, lower costs, higher quality and reliability, higher profit margins, becoming more results orientated and having better interdepartmental co-ordination and higher worker morale (Meredith & Mantel 1989). More specifically Swanson (1988) noted that planning the project implementation and managing the size of the project in comparison to its planned time scale and budget was an important consideration. Land (1989) also noted that successful implementation requires a clear plan for the scope and role of the system.

Alternatively project where strategic and project planning problems are found may 'begin well but tail off' (Bessant, 1994). Bessant (1994) says this could be caused by 'lack of long-term maintenance and strategic management. Goals need to be restated regularly and progress towards them monitored and reviewed on a regular basis'. Grover et al (1995) also state that lack of project management may cause: lack of alignment between corporate planning and IT planning, lack of appropriate planning, lack of strategic visioning, poor communication between team members and other organisational members and difficulty in measuring reengineering project performance. McGolpin & Ward (1997) found that where

an inappropriate planning approach was taken then there was more chance of implementation failing.

In addition it is also important to realise that project management has several disadvantages that may affect implementation. Managing change by a series of projects could become rigid and inflexible; this may lead to project management being overly bureaucratic in nature. Senge (1990) talks about project management creating a 'fixation on events'. This means that people's thinking becomes dominated by short-term events, to such an extent that the project's longer-term progress and complete implementation is not considered.

2.2.3 Individuals' Attitudes, Decision Styles and Resistance to Change

Kwon & Zmud (1987) found from a review of past research that there was a strong link between individual variables (extent of cosmopolitan attitude, educational background and involvement in change) and receptivity (and adoption) of change. Kwon & Zmud also discuss the effect task-related factors may have on implementation. The amount of change the implementation will cause to task uncertainty or certainty, autonomy, responsibility, variety of work, identity with tasks and feedback mechanisms may affect the outcome of implementation.

Several implementation studies discuss the effect user-attitudes about the implementation can have on the eventual outcome. Lucas (1981) proposes that user attitudes are important as, typically, users with particular attitudes are likely to have certain responses to a new system. Lucas suggests that the response from a particular user with a particular attitude may be tested in advance. This could be useful in predicting the likely 'use of a voluntary system or satisfaction with a mandatory system'. Work in a similar area by Ginzberg (1981) suggests that where users have an unrealistic expectation of a system then

implementation failure is more likely.

Another body of work usually categorised as decision style refers to the different approaches people take to solving problems. The difference in decision styles between the system developers and users has been noted as an inhibitor to implementation. Lyytinen & Hirschheim (1987) note that one of the primary reasons for IS failure is that IS professionals do not possess sufficient, or have different abilities.

Land et al (1989) suggested that where the adaption of working practices is minimal then it is less likely resistance to change will occur. Land et al (1983) also suggests that in contexts where there was greater experience and understanding about a change less resistance from system users was likely. Markus (1983) defines resistance to change as 'behaviour intended to prevent the implementation or use of a system or to prevent system designers from achieving their objectives.' Cooper (1994) reported that the types of resistance to change which may cause implementation failure include: 'uncertainty concerning jobs, skills etc., lack of felt need, potential redistribution of power and resources, lack of organisational validity and lack of management support.' In addition, Markus (1983) divides reasons why people resist change into three areas of: resistance caused by internal factors to a person or group, poor systems design, and interaction of system design features with characteristics of the users.

2.2.4 User Involvement

Meredith's (1981) research into user involvement in the design and implementation of a system suggests that 'user participation is the only factor that is consistently correlated with implementation success'. Lucas (1981) supports the notion of involvement and maintains that 'involvement results in systems of better quality because the user understands his or her job and information processing problems'. Users will also be 'better trained and more knowledgeable about the systems' where they are involved in the complete implementation.

Typically where users are involved in implementation and their 'inputs' are considered by the systems designers, realistic expectations about the systems capabilities are formed and a greater feeling of ownership of the system is created. This should lead to a greater chance of implementation success (Ginzberg 1981, Lucas 1981). Swanson (1988) suggests that favourable user attitudes towards the system mean that use and acceptance of the system are more likely; conversion and installation of the new system may also be easier (Lucas 1981, Lucas et al 1990).

An approach often cited as a method to encourage user involvement in the systems development process is Participative Systems Design (PSD). Hirschheim (1983) describes PSD as 'handing responsibilities for design and means of introduction of a new system to that group of workers who must use the system' (Land et al, 1983). PSD is considered an important concept, as 'user involvement in the development of information systems has been claimed to be the key to successful system implementation.' Ives and Olsen (1981) note the advantages of PSD to include 'increasing system quality, decreasing resistance to change and increasing user commitment to new systems'.

Although PSD and related concepts have been researched heavily, authors such as Ives and Olsen (1981 and 1984) and Lucas et al (1990) note that there is considerable lack of empirical evidence to support the concept and its link to assisting successful implementation. Indeed Hirschheim (1983) goes as far as to say that 'available literature offers little to our understanding of participative systems design.' In conclusion, Hirschheim (1983) notes of PSD that although there is 'widespread positive feeling about it.....few organisations have ever used it a second time'.

More recently Mumford and Beekman (1994) have developed a socio-technical approach for business process reengineering, called PROGRESS (Process redesign, Organisational and Group Relationships, Efficiency and Social Stability). PROGRESS provides an approach for analysing and designing processes. An important element of the philosophy behind the methodology is that users of the system should 'play a major role in (the process) its redesign' (Mumford and Beekman, 1994).

Although the early 80's research did not prove conclusively whether user involvement was a necessary factor for successful implementation, it is still a widely written about and discussed concept; for example Ewusi-Mensah and Przasnyski (1994) concluded from their study of factors leading to the abandonment of IS development project that discouraging or taking for granted user involvement may contribute to 'termination of the project'. Alavi and Joachemsthaler (1992) also concluded from their research into factors involved in successful decision support systems that 'manipulating user-situational variable (involvement, training and experience) can improve the implementation success rate by as much as 30 percent'. In addition, models of user involvement in change are still being developed; for example Newman and Noble (1990), Lucas et al (1990) and Tait and Vessey (1989). The large amount of literature on the subject of user involvement indicates that it is still a significant factor to be considered during implementation.

2.2.5 Training and Development

Several writers on implementation (Meredith 1981, Lyytinen et al 1987, Land 1989, Grover et al 1995) recognise that education and training are an important requirement for implementation success. Meredith (1981) notes the importance of training in assisting the new system to gain a 'foothold' instead of users 'clinging' to the old system. Meredith recommends that training about the system, why it is being installed, how to request and use information should be provided. Meredith also suggests that training should be a continuous process, where new users are trained when required. The two most important problems Grover et al (1995) found concerning training affecting implementation of process change, were the inadequate provision of training for personnel affected by the redesigned process and inadequate time spent on developing new skills for the redesigned process.

2.2.6 Context of Implementation

Understanding the factors that affect implementation is important. In addition understanding the 'context' of the implementation is also important. The importance of each factors will differ from project to project. In one project gaining top management commitment may be particularly difficult, so in that context that factor is extremely important. Authors such as; Grover et al (1995) and Walsham (1993) stress the importance of the context of the implementation. As described by Keen and Scott Morton (1978) 'implementation is a contingent process, meaning that the characteristics of the situation must determine the approach the implementor should take'. In reference to user involvement in implementation Newmen and Noble (1990) state that the 'organisational setting' including the structure, culture and history may affect the relationship between the users and systems designers, thus, affecting the eventual implementation outcome'. Assessing what factors are important in different contexts is an important consideration that will be taken into account during this research.

2.3 Factors Affecting Process-Based Change

This research focuses specifically on implementation of process-based change. Thus, it is important to examine the literature written specifically about implementation of process-based change.

As described in the introductory chapter process-based change at IBM is typically known as Business Process Re-engineering. Re-engineering involves radically redesigning business activities by applying the concept of process and typically exploiting information technology and systems to do this (Earl, 1994). BPR is often described as a radical form of process-based change. Hammer (1990), who wrote the seminal article on re-engineering defines it as, 'the fundamental rethinking of business processes to achieve dramatic improvement in critical, contemporary measures of performance, such as cost, quality, service and speed.'

The literature about process-based change is more recent than the implementation literature that has been reviewed so far. Literature on this subject began to emerge at the beginning of the 1990's.

It is well documented that the number of organisations carrying out BPR projects is large; for example Bashein et al (1994) reported that 'some surveys show that as many as 88% of large corporations are involved in business processes re-engineering projects'. In addition, Hammer (1995) report 'between 75 and 80 percent of America's largest companies had already begun re-engineering and would be increasing their commitment to it over the next few years'. In contrast to these reports It is also well documented that the number of process change projects that fail are high (Bashein et al, 1994, Hall et al, 1993, Guimaraes, 1997, Peltu et al 1996).

Many BPR articles discuss how to achieve successful re-engineering (Childe et al 1996, Guimaraes 1997, Bashein et al 1994, Turner 1995). Typically, a list of success factors that should be included in a process re-engineering project for it to become successful are presented. The literature available varies from listing several core success factors to presenting a checklist with a multitude of suggestions. Some of the most commonly quoted factors for a successfully implemented process change project include:

- **Top management commitment leadership and sponsorship.** Top management commitment and active involvement are essential. A high level steering committee has the ability to remove any obstacles in the path of the project; it will also aid forming commitment in all the participants. (Childe et al, 1996, Guimaraes 1997, Bashein et al 1994, Hall et al, 1993)
- **Re-engineering methodology.** A clear well communicated formal plan for the change process must be created. The use of a methodology may aid this process. (Childe et al, Guimaraes 1997)
- **Well-trained cross functional teams.** It is important that a representative from each part of the organisation affected by the re-engineering should be part of the project teams. Teams can be used 'for driving the BPR projects through' (Turner 1995). Childe et al (1996) say that in a successful project 'there was almost always a dedicated resource tasked with project management and the execution of core activities'.
- **Human Factors.** 'If BPR is to transform our companies it is essential to change the attitudes of the people who staff them as well' (Leigh, 1994). Some of the most complex problems faced by re-engineering are the human issues. Employees and their culture must change with the organisation. Employee's fears should be identified and reassurances given and employees should be involved at all levels of the project.

Grover et al (1995) have carried out research into the issues affecting the implementation of processes. A comprehensive list of sixty four implementation problems was derived from research in 105 organisations. The problems were categorised under nine headings of:

- Management support
- Technological competence
- Process delineation
- Strategic planning
- Tactical planning
- Change management
- Human resource
- Project management
- Time frame

The research offered a useful indication of the amount of influence each factor or category may have on success of implementation. The problems were weighted in terms of importance to the participating organisations. The most important category to emerge was change management. This included planning for resistance to change, communication of reasons for change and new values and making changes to human resource strategies.

Extensive research into the factors important for successful process change was completed by Laakso (1997). Laakso reviewed seven studies of process change success and failure factors. Each study was analysed in comparison to Burke-Litwin's (1992) managing change model. The Burke-Litwin model is concerned with twelve transformational and transactional variables that should be analysed when considering a change programme. Transformational alterations are those caused by 'interaction with environmental forces' that lead to a completely new way of working for those affected by the change.

Transactional alterations are those initiated by 'short-term reciprocity among people and groups' where one person does a piece of work for the other whom then reciprocates. A summary of the results is set out in table 2 below:

Categories	Description
Structure.	<ul style="list-style-type: none"> • Project has wrong sponsor • The importance of communication is underestimated • Re-engineering team is narrowly made-up • Failure to anticipate and plan for the organisational resistance to change • Jobs are not structured with overlapping responsibilities and rotation, etc.
Systems	<ul style="list-style-type: none"> • Investments required are hard to justify • BPR was too disruptive to business operations • Rewards are not based on group performance • Lack of tools and skills to promote collaboration horizontally and vertically • Performance measures are not aligned according to the processes
Leadership	<ul style="list-style-type: none"> • Failure to build support from line managers • Project is run and done by an external team • Lack of strong director who is willing to make clear demands • Senior executives are not fully committed for the BPR project • BPR project is subjected as a stand-alone examination
Culture	<ul style="list-style-type: none"> • Redesign plans are watered down by political infighting during the implementation phase • Line managers in the organisation unreceptive to innovation • Old business assumptions are prevailing in redesign phase
Management Practices	<ul style="list-style-type: none"> • Too many improvement projects under way that may be poorly planned, badly integrated and even mutually self-defeating • Participative decision making is not supported • Managers are unwilling to drop their old functional roles
Task Requirements and Individual Skills/abilities	<ul style="list-style-type: none"> • Requested time and costs for human resource development are belittled • Management lacks credibility and skills to lead the BPR project • Incompetence of managing change although it is recognised as an issue etc.
Climate	<ul style="list-style-type: none"> • Management of change is poorly handled
Mission and Strategy	<ul style="list-style-type: none"> • There is no clearly identified demand for the BPR project etc.
Individual and Organisational Performance	<ul style="list-style-type: none"> • Project fell short of the expected results
External Environment	<ul style="list-style-type: none"> • Elements that comprise customer value are not understood in redesign

Table 2: Factors Affecting Process-based Change

Table 2 and the research carried out by Grover et al help to illustrate that there are many factors that contribute to the failure of process change implementation.

2.4 Conclusions

This chapter has introduced the area of concern; implementation. The underlying implementation theories have been described and the more common factors that affect implementation have been discussed.

From the above discussion it is possible to see that the number of factors that could affect the implementation of a project is enormous. Where the project is not project managed, or users are not involved sufficiently in design and development or senior management are not committed to the project the possibility of successful implementation could be dramatically reduced. The factors that affect implementation in practice will be investigated in the action research projects (Chapters 5 - 7). In Chapter 8 the factors that evolve from the empirical research in addition to the literature review as inhibiting or encouraging implementation will be expanded upon. In particular how these factors affect implementation will be explored in greater depth.

Implementation literature concerned with the reasons behind IS successes and failures began to emerge in the late 1960's. However, as Kwon & Zmud stated in 1987 'while important findings have occurred, our understanding of IS implementation is surprisingly incomplete'. More recently Myers (1994) has also stated that 'the lack of consistency in the research has been disappointing'. Similarly, this research has found that implementation research follows many different routes. This research will carry out further factor research which will build on the past research and will aim to draw-out some of the consistencies within this research.

Inadequacies have been noted with the factor stream of research. The lack of consistency in factor research has led to some researchers concluding that this stream of research is 'too narrow' (Myers 1994, Kwon & Zmud 1987). Another inadequacy noted by Walsham (1993) is that the factors that affect implementation are 'simplistic concepts' that are 'merely elements which it may be helpful to include in a broader analysis'. Similarly, Newman and Robey's (1992) factor research concludes that factors affect the variance in system success very little. Newman and Robey suggest that the implementation problem can be informed further by implementation processes.

Typically it is suggested that different factors affect implementation at different stages of implementation. For example Kwon and Zmud (1987) suggest that individual factors such as educational background and job tenure are generally focused on adoption stage of implementation. This approach of addressing different factors at different stages of implementation is reductionist. McGolpin and Ward (1997) say there is a 'lack of an holistic approach to the analysis of the factors' that affect implementation. The Implementation Framework will attempt to address this weakness. The framework will ensure that all the factors that affect implementation are considered together holistically throughout the complete process of implementation.

Several authors have developed processes to manage implementation and the factors that affect implementation. The process research is useful as it attempts to develop a synthesis between the factors affecting implementation and implementation theories. The following chapter continues the literature survey, with a review of the development of implementation processes over the last three decades.

Chapter 3

Processes to Manage Implementation

The previous chapter presented an overview of the factors that have been reported in the literature as affecting implementation. Typically to help manage implementation a process to guide implementation may be used. A process is useful as it helps to explain the different variables that influence implementation and suggests strategies that could be followed to manage the implementation (Lucas 1981). The 'conduct of the implementation process' has been noted as an important factor that affects implementation success or failure (Ginzberg 1979, Schultz & Ginzberg 1984, Kwon & Zmud 1987). This makes the examination of available implementation processes even more important.

This chapter will discuss a series of processes that have been presented as approaches for managing implementation. The development of these processes since the 1970's will be summarised and discussed. The research questions that evolved from this part of the literature review will be presented at the end of the chapter.

3.1 The Development of Implementation Processes

The first IS, Operations Research/Management Science implementation processes were developed in the 1970's. At this time the concentration was on model building and linking concepts together to represent system implementation. The early implementation processes focused on the relationships between the user and designer and in particular on resolving issues that may arise during systems development (Schultz and Ginzberg 1984).

Some of the first processes of this type are summarised by Schultz & Slevin (1975). The basic objective of these early models was to explain implementation (dependent variable)

by a number of independent variables.

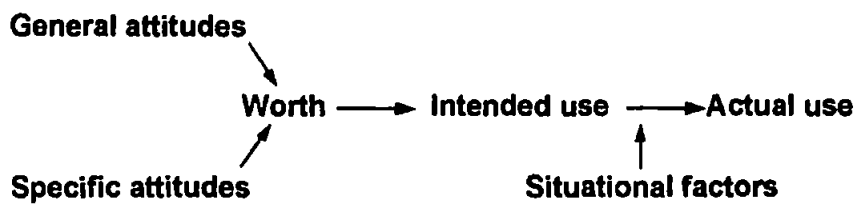


Figure 2: Schultz & Slevin (1975) Implementation Model

An example of these early models is Schultz & Slevin (1975) model, figure 2 above. The intention of this model was to illustrate the links between user attitudes, intentions, behaviour and situational factors with use of a system; for example how the eventual user attitudes would affect systems use. The implementation model illustrates attitudes about the personal stake of the user, interpersonal relations, organisational changes, goal congruence, support or resistance, client-researcher relationship and urgency for results all affected the level of worth the system generates. Worth then affected how much the users intended to use the system. In addition, the amount of actual use the system receives is influenced by various situational factors that may affect the implementation.

Models of this type were typical examples of the early implementation processes. Schultz and Slevin (1975) described these models as the 'building blocks of implementation theory'. They were 'exploratory research' into the 'complex behavioural process' of implementation. The emphasis was on testing these hypotheses and on developing implementation theory, not on collecting empirical data to support the models.

The next phase of implementation processes focused on rectifying the weaknesses of the early processes. In this phase process models were enhanced and tested and there was much more emphasis on empirical work to support the models. In addition, the models were becoming more firmly grounded in theory.

3.1.1 Lewin's Process of Change

Many of the processes developed during this time used Lewin's model of change to represent the implementation process. This model is often cited as the fundamental process of change model. Lewin's process of change consists of three stages; unfreezing, moving and refreezing.

- The unfreezing stage is concerned with preparing people for change with an aim of improving users' acceptance to change. Lewin describes an organisation as having positive and negative force fields. Negative forces that discourage change should be reduced and forces which encourage change should be advocated. Unfreezing is more likely if the awareness of the need for change is raised and clear communication takes place.
- The moving stage involves making the actual change, which includes analysis, design and installation. Again, the forces in favour of change should be encouraged and those against change should be discouraged.
- The refreezing stage is about stabilising and reinforcing the change so that it is maintained. New behaviours need to become institutionalised for the change to be successful.

Lewin's model is a useful way of thinking about the whole process of change. Although this model is often cited as a fundamental process of change, there are some aspects of the model that are questionable. Lewin's model assumes that the process of change commences in a stable environment where there is currently no change occurring. This in reality is often not the case. The model also assumes that the positive and negative force fields that affect change can be identified and then altered to affect change in the appropriate direction. The Ginzberg (1979), Lucas (1981), Keen (1981), Kwon & Zmud (1987) implementation processes are examples that used Lewin's model to underpin their

models.

In a couple of instances Lewin's model of change has been used in conjunction with Kolb & Frohman consultancy model. Kolb & Frohman's model was used to represent the stages of the implementation process. The Ginzberg (1979) and Lucas (1981) implementation processes are two such examples.

As illustrated in figure 3 typically the first stage of Lewin's model, unfreezing (preparing for a change) is compared with Kolb and Frohman's first three stages of Scouting, Entry and Diagnosis. Scouting is concerned with exploring the potential for a relationship between the change agent and the client. Entry is about gaining formal entry into the organisation. The diagnosis stage is about identifying the problems that the organisation is facing. Lewin's Moving stage is related to Planning and Action and Evaluation, this is where the actual change is defined precisely, put into action and then an estimate of success of the implementation is calculated. The final stage of Refreezing is compared to the Evaluation and Termination stages, referring to the change becoming integrated and accepted into the organisation and becoming part of standard behaviour.

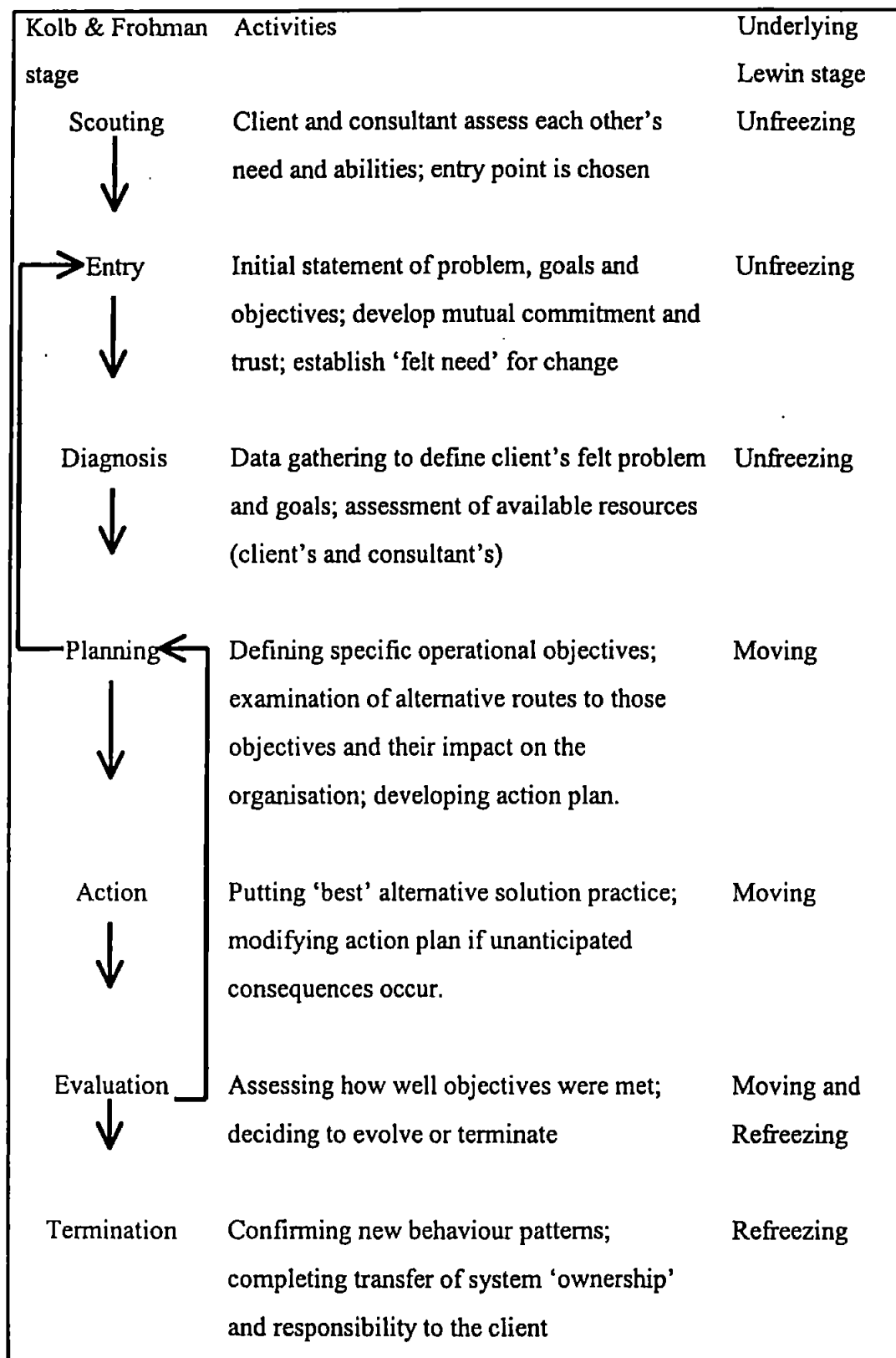


Figure 3: Ginzberg's (1979) Implementation Process

Ginzberg (1979) says that the use of the Lewin and Kolb and Frohman models should only be considered as a first-pass of a theory-based model of implementation. Ginzberg also notes that these models do not represent the full range of knowledge about organisational

processes and more developed models of implementation should be developed by using literature from other domains.

3.1.2 Ginzberg's (1979) Implementation Process

Ginzberg used the stages of the Kolb and Frohman model to represent the different stages of implementation. Ginzberg's implementation process tested several hypotheses. The major hypothesis was the outcome of the project is directly related to the quality of the implementation process. Ginzberg assumed that where issues were resolved at each stage of the project the likelihood of implementation success was improved. A second hypothesis stated that a more organisationally complex project would place more strain on the implementation process than a less complex project. A third hypothesis was based on the interaction between the users and system designers, the resolution of any issues they may have and the eventual effect this may have on user satisfaction.

Ginzberg collected data on 29 information systems in eleven organisations. Data was collected from users and designers about how they perceived the success of the project at each stage of implementation. The most significant findings were found with the termination stage. Successful projects were rated significantly higher at termination stage. Ginzberg also found there were differences of opinion between designers and users on how successful the stages of implementation had been. Ginzberg concluded that there was 'a lack of communications or understanding between users and designers' (Lucas 1981). Little evidence was found to support the hypothesis that more complex projects put greater strain on the implementation process.

3.2 Other Implementation Processes

The development of implementation processes described above illustrates how the early work of Schultz and Slevin (1975) and Ginzberg (1979) has been developed, expanded and built upon. The most recent implementation processes have sought to build on past implementation models and test them further. Research into indirect and direct relationships between factors and their effect on implementation outcomes was expanded. This generation of models also aimed to integrate the factor and process research further and to expand the empirical support. Where possible political, cultural and organisational aspects affecting implementation were incorporated (Lucas et al 1990).

Other implementation processes have been developed independently of this stream of work. As recommended by Ginzberg (1979) some of this work has used literature from other domains. For example Kwon & Zmud (1987) have developed an implementation process-based on an extension of an organisational innovation model. Meredith (1981) developed an implementation methodology for computer based systems. The methodology was developed from management information systems, operations research, management science and production-inventory management literature.

Kwon and Zmud's research concluded that organisational innovation and information systems research has not taken a sufficiently wide view of implementation. Innovation literature concentrated on the individual and structural factors that affected the adoption stage. Information systems literature focused on individual factors that affected use of the system. Kwon & Zmud recommended an increased understanding of the implementation process may be achieved by taking a wider perspective of implementation.

Similarly, Meredith's research concluded that previous implementation research had been

incomplete, inaccurate or insufficient. In particular Meredith felt there was a lack of distinction between the symptoms and basic causes of implementation failure. Meredith states that his work provides managers with information on the basic causes of implementation success or failure. With this information Meredith suggests that managers can better analyse their chances of implementation success.

3.2.1 Kwon & Zmud's (1987) Implementation Process

The original innovation model Kwon and Zmud's work consisted of initiation (pressure to change), adoption (decision to invest resources in change effort) and implementation (development, installation and maintenance) stages. The model was then extended to include acceptance, usage, performance and satisfaction so that implementation success could be measured. A final stage of incorporation was added so that the implementation would become embedded in the organisation. As illustrated in figure 4 below the stages of the model were then mapped on to the stages in Lewin's process of change to help illustrate that implementation can be a set of tasks for unfreezing, changing and refreezing behaviours.

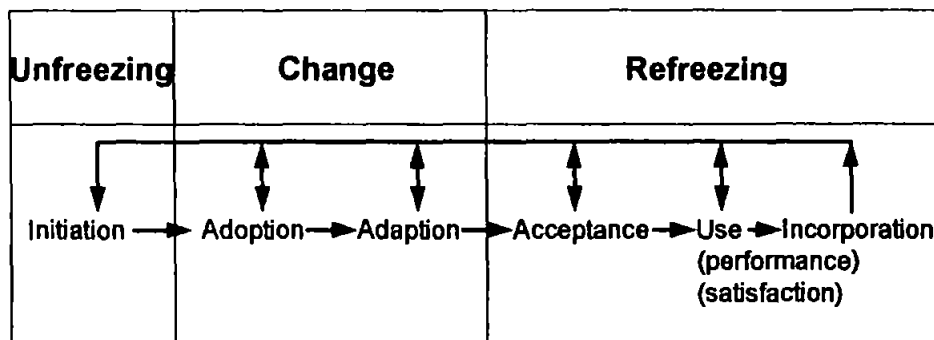


Figure 4: Kwon & Zmud's (1987) Implementation Process

The model included positive and negative feedback mechanisms. Positive feedback was used to encourage implementation and negative feedback to inhibit implementation.

Kwon & Zmud reviewed IS and organisational innovation literature for references to the

individual, structural and technological factors that affect implementation (see Table 2, Chapter 2). Each factor was compared to the stage of the implementation process affected. A matrix was plotted to compare the factors that had been noted in literature as affecting implementation against the stage in the implementation process that they affect.

3.2.2 Meredith's (1981) Implementation Methodology

Meredith's implementation process differs from the process already presented as it offered a series of suggestions that should be followed during implementation. His methodology should be used to indicate where any weaknesses are, so they can be addressed. Meredith advises that if any factors are weak then implementation is more than likely to fail.

Meredith's methodology addresses three implementation factors, which are technical, process and inner-environmental. Technical factors are concerned with areas such as data validity, employee training and project team operations. Process factors refer to levels of involvement and commitment from both top management and users. The final factor of inner-environmental considers two points; the system must address a real, current and important organisational problem and management must be willing to make changes to the organisation that will support the new system and must not reward those using the old system.

Meredith presents his methodology as a checklist of three parts. Firstly Meredith recommends that the inner-environmental issues are addressed by asking top management a number of top level open questions such as:

- Is this a crucial opportunity or problem?
- Is this the only feasible alternative? If not, is it better solved now than later?
- Are we willing to change our organisational structure to capitalise on this opportunity?

- Are we willing to change the basic way we operate and, if necessary, give up some of our power?

These questions should be answered and receive a positive acceptable response before the process of implementation continues.

The process factors should be considered next. A major concern at this stage is ascertaining whether the users are likely to accept the system. It is possible that user participation in design may lead to greater possibility of user acceptance.

Finally the technical factors such as data validity, education of the users and the ability of the project team should be confirmed. At this point it is important to note that the original requirements may have changed, so that the implementation plan may have to be continuously improved.

3.2.3 Sabherwal & Robey's (1993) Taxonomy of Implementation Processes

One of the most recent developments in implementation processes research has come from an empirical survey by Sabherwal and Robey (1993). A series of six different implementation processes was developed that could represent the alternative courses of events that implementation could follow. The six implementation archetypes were logical minimalist, traditional off-the-shelf, problem-driven minimalist, text-book life cycle, outsourced co-operative, and in-house trial-and-error.

Table 3 describes the sequence of events that each approach may contain. Sabherwal and Robey (1993) found it was possible to divide the type of implementation models they researched into three categories. These categories were either by process, phases, or sequence of events. Process referred to implementation models that offered a selection of

recommendations that should be carried out but in no specific order. Phases refers to methodologies that assumed stages occur one after the other in order. The final category refers to the implementation process as a sequence of social actions (events) which the information system must progress through.

Implementation Processes	Sequence of Events
Logical Minimalist	Submission of proposal, approval or authorisation, selection of a specific vendor, physical system construction, training, physical system construction
Traditional Off-the-shelf	Submission of proposal, project definition, seeking technical knowledge/equipment, submission of proposal, selection of a specific vendor, reassignment of organisational roles, project definition.
Problem-driven Minimalist	Performance problems, assessment of performance, seeking technical knowledge/equipment, selection of specific vendor, physical system construction, reassignment of organisational roles.
Textbook Life Cycle	Submission of proposal, approval or authorisation, assignment of personnel to the project, project definition, seeking technical knowledge/equipment, assessment of performance, selection of specific vendor, physical system construction, acceptance/co-operation, training, performance problems, reassignment of organisational roles.
Outsourced Co-operative	Seeking technical knowledge/equipment, submission of proposal, assignment of personnel to the project, assessment of performance, performance problems, submission of proposal, selection of a specific vendor, physical system construction, training, assessment of performance, successful performance, performance problems, reassignment of organisational roles.
In-house Trial and Error	submission of proposal, approval or authorisation, assignment of personnel to the project, project definition, assessment of performance, performance problems, physical system construction, training, resistance, physical system construction, performance problems.

Table 3: Sabherwal & Robey's (1993) Six Archetypal Implementation Processes

The above research provides a useful categorisation of possible implementation processes.

The taxonomy does have its limitations. The research is based on information systems or information technology implementations. The processes derived do not appear to consider implementation factors such as human factors, cultural or strategic factors.

The taxonomy was based on current implementation literature and data collected from 53 information systems implementation projects, however, the validity of the research has several problems. The limitations that were noted by the authors included:

- The limited sample size and narrow geographic coverage.
- Student teams who may have had their own interests and bias were used to carry out the research
- The implementation process archetypes were not linked with the likelihood of implementation success or failure.
- The companies in the research were mainly small companies.

The above section has illustrated that there are many different types of methodologies offered to improve the success rate of implementing a project. The stances that the methodologies take and the level of detail that they offer varies greatly; some concentrate on dealing with the human implications of implementation, others the cultural and many focus on technical implementation.

Sabherwal and Robey (1993) conclude that the taxonomy illustrates that implementation projects can be 'classified in terms of the actions that comprise them'. They claim their work supports researchers into implementation processes and provides work that is grounded in empirical research. The authors say that their research may leads to future work such as; examining the conditions that may lead to success within each process. This could eventually lead to a more complete understanding of the theory underlying IS implementation.

The following research will investigate the implementation processes in use at IBM. An implementation process and the actions it is comprised of will be defined. Comparison

with the Sabherwal and Robey (1993) taxonomy will be made if appropriate. Much of their work is built on text book life cycle implementations, outsourcing and off-the-shelf solutions that may not be appropriate to this research. A recommendation from Sabherwal and Robey's work is that it would be useful to include actors in the analysis of the processes. The following research will build on this idea by taking the actors involved in the implementation into consideration; for example the project team, information system and process users and project sponsor.

3.3 Research Questions

Research questions are important as they help to focus and guide the area of research.

Miles and Huberman (1994) state a research question will 'represent the facets of an empirical domain that the researcher most wants to explore'. The area of concern of this research is implementation. In particular, viewing implementation as the complete process of change and understanding what happens when an organisation implements process-based change. A research question was developed to delimit the specific aspect of implementation that was to be focused on.

The factors revealed that affect implementation occur throughout the whole process of change and may affect the organisation, groups or individuals. More recent research such as that of Grover et al. (1995) (see Chapter 2) seems to indicate that management of change may be the most important factor affecting the success of implementation. Yet, other factors such as top management commitment and user involvement seem to demonstrate some of the 'most consistent relationships with system success or failure' (Schultz and Ginzberg 1984).

The causes of implementation failure are still being attributed to varying factors such as top management commitment, user involvement and project management. Lucas (1981) has suggested that to progress the understanding of the factors that affect implementation, there is 'a need to understand what factors are the most important and how they are related to each other'. The following research will attempt to understand what are the most important factors. The research question developed to reflect this intention is:

What are the factors that affect the implementation of process-based change projects?

Five overarching categories of factors that affect implementation success have been identified from the literature; Top Management Commitment, Project Management, Individuals' Attitudes, Decision Styles and Resistance to Change and User Involvement. Throughout the research these factors will be explored further and additional factors inhibiting and encouraging implementation will be sought.

In order to bring together the implementation factor and process research a second research question has been developed. The question was developed to incorporate the two main areas of concern that have been discussed in the preceding two chapters; investigating the important factors that affect implementation and provision of a process to manage implementation of process-based change projects.

A considerable number of processes have been reviewed. Several of the processes were founded upon the Lewin and Kolb and Frohman models of change, however there does not appear to be consistency in the processes that are on offer. Indeed, Lucas et al (1990) have suggested that for 'substantial progress in implementation research' there is a need for 'a common research model' to be adopted. This research intends to build on this past research and develop an implementation process that will improve the management of implementation. The research question that reflects this intention is:

How can we develop an improved process for implementing process-based change projects?

3.4 Conclusions

This chapter and the previous one have reviewed implementation theory factors and processes. This review has helped to illustrate that implementation is a complex concept that is found in many different disciplines. It is a popular subject that has received a considerable amount of attention, mainly due to the still huge amount of implementation failures. By default the fact that these implementation failures are still occurring and being reported in the literature implies that there are still many implementation aspects, problems and issues that have not yet been fully examined, understood and solved.

There is a vast range and type of data available from many different fields, covering many aspects of the concept of implementation. Information is empirical, theoretical and case study based. There does not appear to be much distinction between the quality and type of information. A range of information of various qualities and quantities covers all issues.

The processes available to manage implementation have evolved considerably. Although no one process is more popular than another or has become acceptable as industry standard. Some of the processes have been noted as being complicated to use in practice with little empirical evidence that they work in practice (Lucas et al, 1991). This research aims to build on these past models and develop an implementation process that is easy to use, useful to managers and has been well tested.

The implementation processes reviewed typically divide implementation into phases. For example Kwon and Zmud (1987) compare implementation to the stages of the innovation process (initiation, adoption and implementation). In addition Ginzberg (1979) and Lucas (1981) use Kolb and Frohman's consultancy model to represent the stages of the implementation process. The implementation processes are then based on a series of

recommendations for activities that can be carried out at each stage of implementation. The framework to be developed will consider the implementation of process-based change as a whole process of change and not as distinct phases. Implementation will be approached from a holistic point of view

Most of the processes reviewed had been developed from previous empirical and non-empirical studies; for example Kwon & Zmud (1987), Lucas (1981), Schultz and Ginzberg (1984) and Lucas et al (1990). Ginzberg (1979) based his research into the process of implementation on his own empirical studies. His research involved questionnaire research in 11 organisations. In addition, much of the factor research reviewed was based on reviews of past empirical and non empirical studies; for example, Meredith (1981), Lyytinen & Hirschheim (1987) Lucas (1981) and McGolpin & Ward (1997). Further research will aim to provide guidance for implementation from primary empirical, long-run, in-depth implementation factor and process research.

Researching implementation theory, factors and processes was useful as it provided a fuller picture of the literature available about implementation. In addition, Newman and Robey (1992) suggest that combining factor and process research will produce more comprehensive explanations of implementation success. They also suggest that these two research streams are complementary, where factor research should be used to understand connections between conditions and outcomes. This should be followed by process research that investigates the sequence of activities that explain the connections.

The main weaknesses of the implementation factor and process stream of research that the improved implementation process will deal with are summarised below:

- The simplistic and static nature of implementation factor research will be addressed by

using the results as input to the development of an implementation framework.

- The lack of consistency of factor research will be addressed by data analysis. The inconsistencies in the factors that affect implementation will evolve from the analysis of empirical and theoretical findings.
- Much of the factor stream of research is based on retrospective studies of the factors that affect implementation. This research will investigate the factors that affect implementation during the implementation rather than after the project.
- Many of the factor stream of research studies are based on case study and questionnaire research with few action research studies. This research will address this gap by carrying out a long run, in-depth three year action research project in one company.
- The reductionist approach to dealing with the factors that affect implementation throughout the whole process of implementation will be dealt with by handling all the factors that affect implementation together holistically throughout the complete process of implementation.
- The reductionist approach of dividing the process of implementation into a number of phases will be addressed by dealing with implementation holistically as a whole process of change.
- The implementation framework will address the problem that processes are too complicated to use in practice. To ensure the framework is understandable, meaningful and appropriate for its intended audience it will be tested on a fourth project at IBM. Applying the framework to another project will assess whether the terminology is clear. Most importantly applying the framework will address whether it is useful in other areas and to different people in the organisation.
- The weakness that implementation processes are not useful to managers will be addressed. The framework will focus on the implementation issues that were raised from the empirical research. The framework will be tested and adjusted accordingly to ensure it is appropriate to its intended users.

This research will attempt to understand the key factors that are affecting implementation of process-based change in organisations today. A practical approach to deal with these factors and manage the process of implementation will also be developed. The research method that has been chosen to address the gaps in the literature and to answer the research questions is explained in the following chapter.

Chapter 4

Research Methods

The researcher has been based full-time in the host organisation, working as an IBM sponsored student. Before a study, investigation or intervention in the organisation was started, a method of research was chosen. It was important that the research method chosen was appropriate to address the areas under study. The following two research questions have been developed to define and focus the direction of this research:

What are the factors that affect the implementation of process based change projects?

How can we develop an improved process for implementing process based change projects?

The research method must be appropriate for addressing the research questions, so that good quality, reliable results are produced.

When selecting an appropriate research method Gummesson (1993) states it is important that it complements the research's scientific paradigm. The researcher must take a stance on what ontological and epistemological philosophical assumptions the research is founded in. Gummesson describes this as the choice between being the "knight of the hard facts" (positivistic) or a "knight of soft facts" (phenomenology and hermeneutics) or a combination of both.

The purpose of the first half of this chapter is to explain the philosophical assumptions that

this research is based upon and why. The research method that was chosen to complement these assumptions is then described and discussed in the second half of the chapter. How this research method has been validated is also presented. The additional research methods and techniques that were used during the action research and how they were validated are also presented.

4.1 *Ontology*

One of the first decisions a researcher must make is what ontological perspective the research will be approached from. Ontology is about the 'assumptions which concern the very essence of the phenomena under investigation' (Burrell & Morgan 1979). Ontology is the difference between believing the world is real and 'out there' or is just 'the product of one's mind'.

On one side of the ontological debate there is nominalism. For the nominalist the structure of the social world is 'made up of nothing more than names, concepts and labels' (Burrell & Morgan 1979). Nominalists claim that there is no 'real structure to the world' (Burrell & Morgan 1979). Alternatively the other side of the ontological debate is realism. Realism claims that the real world is made up of 'hard, tangible and relatively immutable structures'.

A realist views the world from an objective standpoint where he or she uses permanent frameworks to determine what is knowledge, truth and reality. A nominalist on the other-hand views the world from a subjective standpoint that has no overall guiding frameworks that can be used to judge, understand or evaluate someone or something (Bernstein 1983). This research takes a more nominalist approach where interpretation will be through the researchers 'senses by means of terms and concepts, models or theories' (Gummesson 1993).

4.2 Epistemology

The ontological perspective that the researcher has chosen will affect the methods of research that are used. The method that may be used to understand the world and how this understanding can be communicated to others is known as Epistemology.

The epistemology debate ranges from positivism to anti-positivism. A positivist aims to 'explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements. Alternatively, the anti-positivist believes that an understanding of the world can only be gained from the people who are directly involved in the activities to be studied.

The epistemological stance that is taken is significant, as it will affect the research methods and tools that a researcher can employ to investigate the activities under study. For example if a positivist approach to research is taken, then quantitative research methods involving 'hard facts'; such as statistics and mathematics (Gummesson 1993) will often be utilised. If an anti-positivist approach is taken then qualitative research methods such as observation and diary accounts could be applied.

'Implementation of information systems is primarily concerned with people, organisations and organisational change' (Myers 1994). A positivist perspective is primarily concerned with how the technology works or in the case of this research; how the process works. In contrast, this research is more concerned with what process changes will do in the 'context of human practice' (Myers 1994), how the process change will be used and what the process change means to employees in the organisation. Myers (1994) argues that 'a richer, integrative view of information systems implementation is required' and proposes hermeneutics as an appropriate approach.

In addition, the researcher recognises that there are advantages of both the positivist and anti-positivist approach. An approach that falls between subjective and objective epistemology is hermeneutics.

4.3 Hermeneutics

Hermeneutics is frequently described as a theory of understanding and interpretation, (Gummesson 1993, Thiselton 1992, Bernstein 1983, Anders Richardson 1995) typically of texts and originally biblical texts. Hermeneutics has been defined by Burrell and Morgan (1979) as 'interpreting and understanding the products of the human mind which characterise the social and cultural world'. These products may be works of art, texts, traditions, language, religions or people. The term hermeneutics originates from Hermes the Greek gods' messenger who would deliver and explain messages between gods.

The understanding and scope of hermeneutics has expanded greatly during the twentieth century. Schleiermacher and Dilthey were the first philosophers to expand the traditional scope of hermeneutics. In 1960 Gadamer published his life's work in philosophy and hermeneutics: 'Truth and Method'. This work was fundamental in moving hermeneutics towards an ontological perspective. Gadamer believes that gaining understanding underlies all human activities and is our 'primordial mode of being' in the world (Bernstein 1983). Taking an ontological perspective of hermeneutics means the event of understanding should be analysed itself. In an extreme sense, this may mean that understanding may only be possible by complete immersion in the subject of study. This approach to hermeneutics is a more subjective philosophical stance where the ontological base is more towards nominalism than realism.

Having the scope to use both subjective and objective research methods will be very useful for addressing the research questions presented at the beginning of this chapter.

Hermeneutics is a very useful approach for understanding and interpreting the research projects and the factors that are affecting implementation. The researcher will be able to immerse herself in the process change projects in order to understand them. In addition interpretation of different perspectives and understanding different situations is essential for this research. Thus, it is a hermeneutic epistemology that will be followed during this research.

4.3.1 The Hermeneutic Circle

Dilthey suggested the hermeneutic circle as a method to apply hermeneutics in practice. The hermeneutic circle is about understanding something within its context. An analogy often used to explain the hermeneutic circle is, to understand words in a sentence, they need to be understood within the context of the whole sentence. Independent of the sentence the words may have a different meaning, compared to their meaning within the context of the sentence. The hermeneutic circle also recognises that gaining understanding is an iterative process where an enhanced understanding is gained with each iteration or cycle of investigation. It also recognises that understanding takes place through individuals' preconceived frames of reference and prejudices. The hermeneutic circle method involves the interpreter being open to what is trying to be understood.

By applying the hermeneutic circle to this research, understanding will grow and develop with each involvement in a project. The researcher's understanding of the whole (factors that affect implementation) will gradually improve as more information is gathered and interpreted (Myers 1994). It is also recognised that it is complex social situations that are being researched at IBM. There will be no specific place to begin understanding. In this respect the hermeneutic circle will be extremely useful to develop understanding.

4.4 Selecting an Appropriate Research Method

As explained in the opening paragraphs of this chapter, a research method that is capable of answering the research questions and one that complements the philosophical assumption of the research must be selected.

Similarly, Dingley et al (1997) suggests that the area of concern should be considered when choosing a research method. Dingley et al also suggest that the research design and general factors, such as the cost should be thought through. Other concerns in selecting a research method have been voiced by authors such as, Meredith et al (1989), Susman and Evered (1978) and Galliers and Land (1987). Their concern is that there are weaknesses in current research methods. In the field of information systems the main concern is the decline in usefulness and relevance of current research methods, in solving the practical problems of organisations and people in organisations. Meredith et al (1989) summarise the criticisms of current operations research methods as:

- Limiting the research to a narrow rather than a broad scope.
- Concentrating on applying techniques instead of knowledge.
- Taking an abstract instead of reality perspective.

There appears to be a gap between what academia is researching and what industry needs researching. Meredith et al (1989) concludes that this gap is caused by the lack of knowledge about appropriate alternative research paradigms. Writers such as Reisman (1988) and Meredith et al (1989) have put forward useful frameworks to help with choosing between the alternative research methods.

The Meredith et al (1989) framework (figure 5) is based on the categorisation of research

from rational to existential and from natural to artificial. The rational to existential axis notes the philosophical basis of research. Rational views believe the nature of truth is logical and independent of man. The existential is based on the view that truth can only be interpreted through individuals' experiences. The natural to artificial continuum indicates the source of information and data used in research and the type of information and data collected.

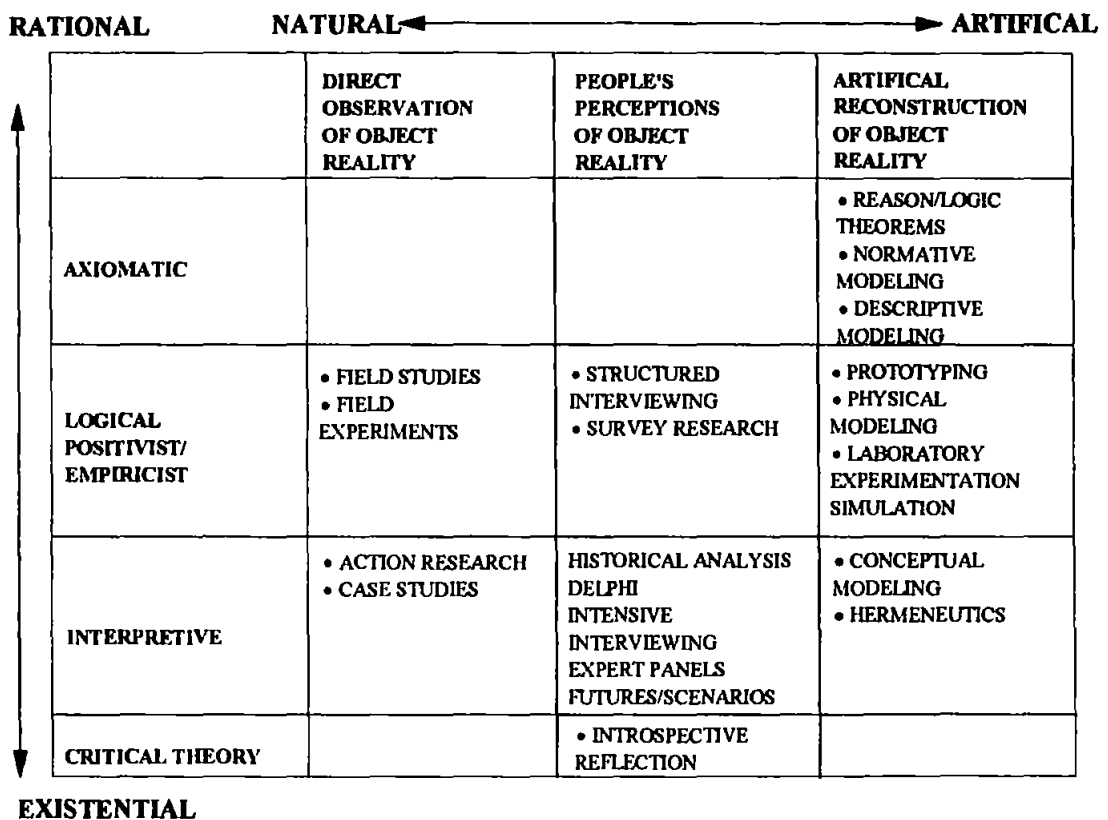


Figure 5: A Framework for Research Methods (Meredith et al. 1989)

Meredith et al (1989) concluded from this framework that there was a need for research methods to move to more 'naturalistic paradigms (especially direct observation via case, action and field studies) and existential (primary interpretative) paradigms'.

It would appear that there are two considerations when choosing a research method.

Firstly the method must be relevant to the discipline under study. Secondly the research method should address the weakness in popular research methods and investigate real, unstructured, operational problems.

This research is focused primarily in the area of information systems. Dingley et al (1997) recommend that applied research methods, such as consultancy, participant observation, participatory action research and action research are appropriate for researching information systems. In addition Galliers (1991) concludes 'the survey, descriptive/interpretative and action research approaches appear to have the widest applicability in information systems research'. Similarly, Wood-Harper et al (1993) and Baskerville and Wood-Harper (1998) particularly recommend action research, as an appropriate method of research in the IS discipline. Indeed, Wood-Harper et al refer to action research as 'a cornerstone of IS research methods'.

In the light of conclusions from the Meredith et al (1989) framework it would appear that action research is one of the more relevant research methods. Indeed Gill & Johnson (1997) say, action research 'is clearly an important approach to research in business and management, particularly given its declared aim of serving both the practical concerns of managers and simultaneously generalising and adding to theory'. Lyytinen & Hirschheim (1987) also recommend that more qualitative research methods such as action research be used to solve the problems such as the impact of the implementation process on organisational problems.

Action research complements the philosophical assumptions of this research. A hermeneutic approach will be taken; action research is a method that is strongly associated with hermeneutics. Gummesson (1993) goes as far as to say that action research 'should be governed by the hermeneutic paradigm'. The essence of hermeneutics is to immerse

oneself in the situation to develop an understanding of it. Action research is in accordance with this epistemological orientation.

4.5 Action Research

Action research is an inductive research method that gathers empirical evidence by investigating real, practical problems facing social systems. Action research attempts to provide assistance by moving from the empirical evidence to explanations and theories about what is happening in social systems. Action research is unlike scientific methods of research such as laboratory research, that demand formulation and testing of hypotheses (Warmington 1980) in repeatable controllable experimental conditions; such conditions are rarely found in organisations. Action research combines research and practice, thus producing extremely relevant research findings.

One of the most widely quoted descriptions of what action research involves is provided by Rapoport (1970) as:

Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.

Checkland (1984) adds to this description by stating that action research is characterised by:

- 'the immediacy of the researcher's involvement in action;
- the intention of both parties to be involved in change'

Action research insists on the 'immediacy of the researcher' (Rapoport 1970) in changes

taking place. The researcher should form a trusting collaborative relationship with the company where the problem exists. For action research to be valid the problem being investigated must be a significant one to the company. It should also be agreed that the help of an outsider will be required to develop understanding of the problem and the researcher must be perceived as that appropriate outsider. Once the problem has been investigated the company takes the responsibility for applying the research outputs.

Through involvement as a participant the action researcher learns about the organisation. Action research can gain rich insights into different interpretations and perspectives of the changes that are occurring.

Action research has been described as 'the most demanding and far-reaching data generating method in case-study research' (Gummesson 1993). Action research requires an understanding of both qualitative and quantitative research methods. Quantitative statistical analysis or surveys and qualitative interviews, observations and participation can all be applied in action research. Gummesson (1993) has drawn together a comprehensive list of action research characteristics, which help to describe additional complexities of this research method. These characteristics are based on both literature and experience and some of the more important points for this research are summarised in appendix 1.

4.5.1 Action Research Models

Action research is often criticised for its lack of rigour, where too much emphasis is placed on being involved in the change and not enough on research (Dingley et al 1997). Authors such as, Warmington (1980), Gill and Johnson (1997) and Checkland and Holwell (1998) have developed models of how best to manage an action research project and how to achieve a balance between action and research.

The Checkland and Holwell (1998) model was the most appropriate action research model for this research. According to Checkland and Holwell (1998) and Checkland (1991) their model of action research reflects one of the most important principles of action research. This is that the researchers framework of ideas (F), methodology (M) and area of concern (A) should be declared in advance. This is important, so that the lessons, findings and knowledge from the research can be defined within the ‘intellectual structure’ they are based. Without these declarations Checkland and Holwell say that ‘it is difficult to see how the outcome of action research can be more than anecdotal’.

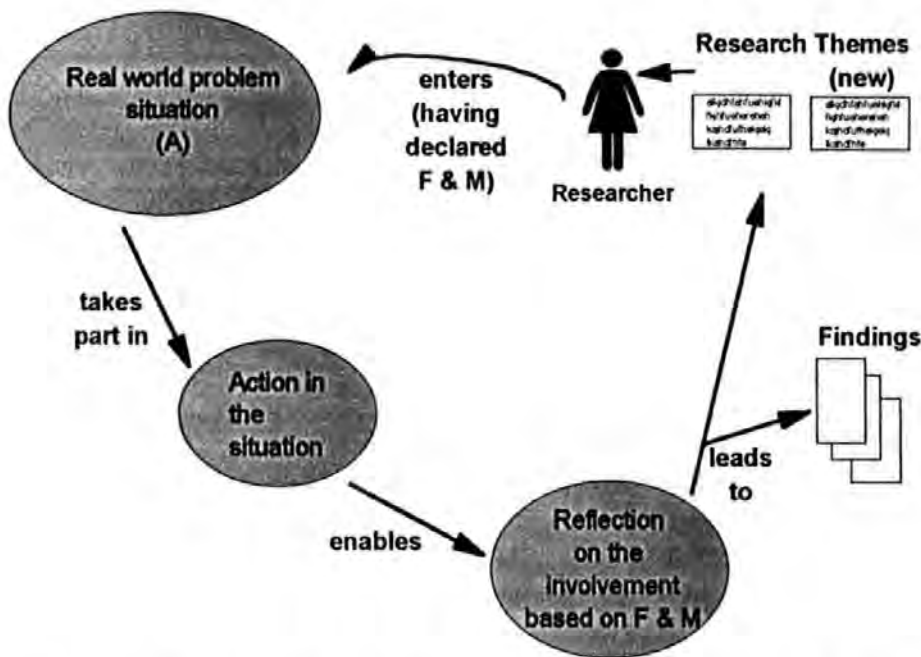


Figure 6: Cycle of action research in human situations (Checkland & Holwell, 1998)

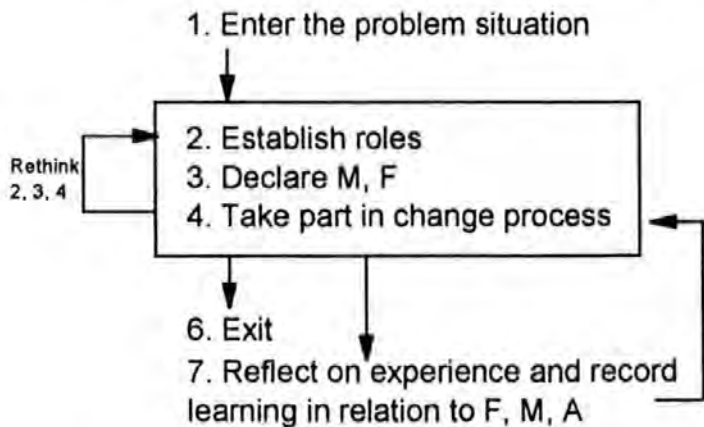


Figure 7: The process of action research (Checkland & Holwell, 1998)

The Checkland and Holwell (1998) model of action research (Illustrated in figures 6 and 7) recommend that the action research should begin with themes from which lessons and/or knowledge can be sought (not hypotheses as with positivist research). The researcher should enter the real-world situation (A) where the themes can be researched, ensuring the F and M that the eventual learning will be recognised within have been declared. The researcher should take part in the change process in the role that has been defined and should record the experiences and outcomes from the involvement. The next stage is for the researcher to reflect on the findings from the involvement using the declared F and M. This reflection may lead to revision of some of the earlier phases. The final activity of the research process is to arrange an exit from the situation. Checkland and Holwell also suggest that 'social laws' do not evolve from involvement in a single situation; the researcher must participate in more than one situation.

The action research process followed for this research was similar to the Checkland and Holwell. Generally in each of the projects entry was gained to the projects where a problem existed: the role that the researcher would take was decided (contracting), problem analysis completed (diagnosis), some implementation (action) and then feedback (evaluation). The A, F and M of the research were declared in the projects, typically to the sponsor and the project teams. The teams were made aware of the researchers joint role as researcher and participant (M). The area of concern; implementation of process-based change was declared as were the framework of ideas (factors from the literature review) and several situations were participated in.

4.5.2 Applying Action Research

A collaborative relationship was undertaken with IBM PSS and the University of Plymouth. As required for action research the researcher acted as a full-time member of the staff of the company, and took a full part in the projects being investigated. Thus the collaboration is ensured by the continuing presence of a university researcher in the company.

The researcher was closely involved with the host company, as a full time member of the Service Delivery Business Improvement (SDBI) team. The SDBI team are a team of seven process change specialists, one of whom is the researcher. The team exists to provide consultancy, guidance and expertise on process change and quality initiatives. The team works primarily in the PSS area. The skills that the team possess include, ISO 9000 quality auditing, process analysis, design, implementation and measurement, process re-engineering, facilitating organisational change, team advising and professional business coaching.

To understand how PSS implement process changes and also what inhibits this implementation, the researcher was closely involved in four projects. The roles the researcher has taken in these projects include facilitator, assistant project manager and project manager and process change consultant. The researcher took these roles from the beginning until the conclusion of each project.

Facilitation is a skill that aims to build a collaborative environment where all participants are involved from the beginning to the end of a course, project or meeting (Brookfield 1986). The role of facilitator involved creating an open, non-threatening atmosphere where participants were encouraged to contribute to the content of the meetings. The objective of

encouraging this involvement is to maximise the effectiveness of people involved in a project. Facilitators are not involved in the content of the meeting, their role is to guide and coach the attendees through the process of the meeting.

Project management is about 'evaluating, planning and controlling a project so that it is finished on time, to specification and within budget' (Lock 1996). The role of project manager involved following the IBM project management methodology MITP (Managing the Implementation of the Total Project). This methodology provided proformas to track project progress and suggested procedures to progress the project.

Consultancy is a skill that requires the application of 'specialist skills in a client environment' (Markham 1997). The researchers role as consultant was to provide specialist process knowledge and experiences to PSS. Specialist knowledge included IDEF0 process modelling skills and understanding of BPR literature and theories.

4.5.3 Appropriateness of Action Research

Even the strongest supporters of action research note that it has several disadvantages.

Eden and Huxham (1996) say that action research can be 'imprecise, uncertain and unstable compared with other forms of research'. Checkland et al (1998) say its validity is questionable as typically, the social situations that are researched are not 'homogenous through time'. Rapoport (1970) reported on three dilemmas that evolve from the dual academic and industrial role of an action researcher. The three dilemmas were related to ethics, goals and initiatives. For example is working in the tobacco or defence industries acceptable? The goal dilemmas refers to the joint responsibility of the researcher to produce something useful to the organisation and academia. Initiative dilemma contrasts the traditional research process of remaining uninvolved in organisational work to the action research method of becoming completely involved in finding a solution to a problem.

Coping with often conflicting research and organisational priorities is a very significant issue. Trying to keep day to day business activities that have been assigned appropriate to research objectives as well as meeting management objectives is often difficult; for example only facilitating meetings that are relevant to the research.

One of the most significant criticisms of action research is in the 'problems in devising controlled replicable experiments' (Warmington 1980). In social systems it would be impossible to repeat a controlled experiment where each element of the experiment is the same. There may be different people, technology or organisational circumstances.

Different projects require different tools, techniques and theories to be applied. Therefore action research does not lend itself to repeatable experiments, as no two situations are identical.

4.5.4 Ensuring Valid Action Research

In an attempt to overcome the problems of action research and to ensure action research is valid, Eden and Huxham (1996) have compiled a list of twelve contentions. If each of these contentions is dealt with, Eden and Huxham state that the research may be viewed as quality research. The first six contentions address the characteristics that action research outcomes should possess and the second half address characteristics of action research processes. These contentions cover five areas; of generality and theory generation, appropriate types of theory development, taking a pragmatic approach, design and validity testing of action research.

It is intended that each of the contentions explained below will be addressed as thoroughly as possible, to ensure all aspects of the research are valid. Eden and Huxham's contentions will act as an underlying framework for the action research.

Outputs of Action Research - Generality and Theory Generation

Contention 1.

'Action research must have some implications beyond those required for action or generation of knowledge in the domain of the project'. 'It must be clear that the results could inform other contexts, at least in the sense of suggesting areas for consideration'.

The results of the research should be useful in understanding situations, other than the situation being studied. The final output of this research will be a framework to improve the management of process based change implementations. This framework will be applied in a fourth project to test whether the framework does improve understanding.

Contention 2.

'As well as being usable in everyday life action research demands an explicit concern with theory. This theory will be formed from the characterisation or conceptualisation of the particular experience in ways which are intended to be meaningful to others'.

This contention suggests that an action researcher may have 'dual aims'. Research should be academically and industrially relevant. The academic relevance of this research is based upon the implementation literature presented in the previous two chapters. The industrial rigour of the research is found in the implementation framework.

The terms used to characterise and conceptualise the outputs will use general rather than specific language. To ensure the framework is understandable and meaningful it will be tested on a fourth project at IBM. Applying the framework to another project will assess whether the terminology is clear. Most importantly applying the framework will address whether it is useful in other areas and to different people of the organisation.

Contention 3.

'If the generality drawn out of action research is to be expressed through the design of tools, techniques, models and method, then this, alone, is not enough - the basis for their design must be explicit and shown to be related to the theory'.

The generality developed from the action research will be an implementation framework. How the different themes of the framework have developed from the literature and empirical evidence using 'grounded theory' will be explained in chapter 8. How the framework is underpinned by theory is also explained in chapter 8.

Theory Development Appropriate for Action Research

Contention 4.

'Action research will generate emergent theory, in which the theory develops from a synthesis of that which emerges from the data and that which emerges from the use in practice of the body of theory which informed the intervention and research intent'.

One of the criticism of action research, is its inappropriateness for repeating experiments. Each time research is tested the conditions will be slightly different. Action research is more useful for generating theory than testing theory. The theory developed through action research emerges from a synthesis of findings from the implementation literature review (chapter 2 & 3), and empirical evidence from the research projects (Chapters 5,6,7).

Contention 5.

'Theory building, as a result of action research will be incremental, moving from the particular to the general in small steps'.

The researcher will note the results of the process change projects over a three year period. The specific results and findings will be used as input for developing a general theory. The general theory will be the framework that can be applied to improve the management of process implementation projects.

Pragmatic Focus of action research

Contention 6.

'What is important for action research is not a (false) dichotomy between prescription and description, but a recognition that description will be prescription (even if implicitly so). Thus the presenters of action research should be clear about what they expect the consumer to take from it and present with a form and style appropriate to

this aim’.

In describing a situation it is possible to infer what factors may have been important in a situation at the same time as detracting from the less important factors. A full descriptive account of each project that the researcher has been involved in can be found in chapters 5, 6 and 7. The results and analysis from the descriptions of the projects will be used to develop a prescriptive framework to help improve implementation.

This contention also states the research should be presented in a style appropriate for its intended users. Testing the framework on a fourth project will assess whether it is appropriate for its intended audience.

Action Research Processes - Designing action research

Contention 7.

‘A high degree of method and orderliness is required in reflecting about, and holding on to, the emerging research content of each episode of involvement in the organisation’.

Eden and Huxham state that for effective action research, it is ‘important to be credible as a consultant’ and most importantly ‘be aware of what must be included in the process of consulting to achieve the research aims’. Although the action researcher may be perceived as taking on a consultancy type role, it is not intended that the situation be entered with a preconceived set of theories or ideas about the output expected. The researcher is expected to develop theories from reflections on the experiences.

Several methods of recording research data have been used. Activities, experiences and reflections have been noted in a series of log books. All articles, papers and books that have been reviewed have been catalogued on a computer database and in a card index file.

Similarly each interview, focus group and project transcript has also been filed in a computer database.

As far as possible the research sequence suggested by Checkland and Holwell (1998) was used to manage the research process used in each of the action research projects. The sequence included; contracting, diagnosis, action, evaluation and withdrawal.

Contention 8.

'For action research, the process of exploration (rather than collection) of data, in the detecting of emergent theories, must be either, replicable, or demonstrable through argument or analysis'.

It is not enough that the action research process in use be based on intuition or 'gut feel'. A repeatable process of analysis has been used to analyse the qualitative information and develop theory. The methods used to validate qualitative information are described at the end of this chapter. The process applied to develop theory is explained in chapter 8.

The Validity of Action Research

Contention 9.

'Adhering to the eight contentions already described is a necessary but not sufficient condition for the validity of action research'.

It is essential that action research addresses the eight contentions described above. These contentions deal with the internal validity of action research. Several other contentions concerning external validity must be considered for action research to be considered completely valid. External validity is concerned with the outputs being relevant within the context being studied and other contexts.

Contention 10.

'In order to justify the use of action research rather than other approaches, the reflection and data collection process - and hence the emergent theories - should be focused on the aspects that cannot be captured easily by other approaches. This, in turn, suggests that having knowledge about, and skills to apply, method and analysis procedures for collecting and exploring rich data is essential'.

Eden and Huxham do not argue that action research is a better research method than others. They do however, state that it is 'likely to produce insights which cannot be gleaned in any other way.' Contention ten is therefore focused on stipulating that the research process and the theory that emerges should concentrate on issues that other research methods cannot easily acquire. Action research is aimed at noting what people do and say 'in circumstances that really matter to them'.

The researcher will use facilitation and coaching techniques to understand from those involved in the projects what is happening in the projects.

Contention 11

'In action research, the opportunities for triangulation that do not offer themselves with other methods should be exploited fully and reported, but used as a dialectical device which powerfully facilitates the incremental development of theory'.

Triangulation should be applied to action research to enhance its validity. Triangulation means that results from the research are cross-checked by several methods with an aim to validate them. Eden and Huxham state action research can utilise triangulation 'between observation of events and social processes, the accounts each participant offers and the changes in these accounts and interpretation of events as time passes. The eleventh

contention notes that action research should exploit all the opportunities for triangulation and that triangulation should be used as a device to encourage the gradual development of theory.

Triangulation is 'the use of more than one source or method of data collection' (Denzin 1989). Opportunities for triangulation will be taken whenever appropriate. The researcher will use coding, focus groups, individual feedback and semi-structured interviews to validate the findings from the research and the framework.

Contention 12

'The history and context for the intervention must be taken as critical to the interpretation of the likely range of validity and applicability of the results'.

The final contention is concerned with ensuring the wider context where the research took place is taken into account. This should include an understanding of the history of the organisation. This history and context of the situation under study should be considered as they may affect the interpretation of the research outputs.

Close involvement in the projects enables the researcher to acquire information about the history of organisational changes. To follow contention twelve, understanding of past and present process change projects in PSS and IBM world-wide has been sought. This has set the process change projects being researched into context. The history of changes will be taken into account when interpreting the research outputs.

4.6 Additional Research Methods

Several methods of research have been used within the framework of the main research method; action research. These methods were grounded theory, focus groups and semi-structured interviews.

4.6.1 Grounded Theory

The fourth Eden and Huxham (1996) contention highlights the fact that action research is more useful for theory generating than theory testing. This research has concentrated on theory generation. As recommended by Eden and Huxham, the method that will be used to develop theory from the empirical research is 'grounded theory'.

The founders of 'grounded theory', Glaser and Strauss (1967) define it as the 'discovery of theory from data'. Grounded theory involves interpreting social actions, notes, interviews and documents. Thus is 'especially suited' with the hermeneutic philosophical foundations of the research (Toraskar 1991).

The development of grounded theory evolved from Glaser and Strauss's (1967) perception that there was an 'embarrassing gap between theory and empirical research'. The aim of grounded theory is to develop theory from empirical evidence. As summarised by Partington (1998) developing theory in this way should lead to development of a useful theory that; fits the real world, works in different contexts, is relevant to those involved in the situation and is modifiable to different situations and new instances. This is extremely pertinent in an action research environment where research outputs are required to be useful in different contexts (contention 1) and is appropriate to its audience (contention 6).

Grounded theory links well with action research as it facilitates the synthesis of empirical data and theoretical data. Eden and Huxham's second contention notes that research

should be firmly underpinned by theory. The theory that is generated will be the foundations of the implementation framework. The two main activities grounded theory uses for generating theory are, focusing data collection into areas that are relevant to the emerging theory and constantly comparing analysed and coded data (Partington 1998, Isabella 1990). The method used to analyse and code the data collected from the action research projects is described in detail in chapter 8.

The theory will not be generated exclusively from action research projects. In addition data will be generated from focus groups and semi-structured interviews.

4.6.2 Focus Groups

A focus group is 'a form of group interview in which the data arise from dialogue and general discussion among participants, rather than from a dialogue between yourself as investigator and a single person as respondent' (Jankowicz 1991). This form of group interview is a useful tool to collect ideas and perceptions on subjects in a non threatening, open environment. Focus groups have the advantage of giving interviewees 'more time to reflect and to recall experiences; also, something that one person mentions can spur memories and opinions in others.' (Lofland and Lofland 1995). Focus groups were used to increase the researcher's understanding about the factors that were affecting implementation.

4.6.3 Semi-structured Interviews

Semi-structured interviews are valued for their 'openness, qualitative nature and interviewee-guided mode' (Sarantakos 1993). Semi-structured interviewing involves asking open-ended questions. This means interviewees are free to formulate responses as they feel appropriate. This is an alternative to where the interviewee has a fixed number of responses to choose between. Open-ended questions were used to develop an understanding of the interviewees' perceptions, beliefs and points of view about reasons for process change projects successes and failures.

4.7 Validity of Qualitative Research

Similarly to action research there are difficulties with ensuring the validity of qualitative research methods; such as grounded theory. As Miles & Huberman (1994) point out 'how will you, or anyone else, know whether the finally emerging findings are good?'. Generally, qualitative research is 'researcher-specific' where 'all researchers develop their own ways of analysing qualitative data' (Partington 1998). Measuring the quality of the analysis when it can be a very individual activity is difficult. Miles and Huberman (1994) have recognised this difficulty and they have classified the issues of measuring the quality of qualitative research into five categories. For each category a list of questions is suggested as a guideline for judging the quality of the research. The categories are summarised below.

1. Objectivity/confirmability - *'the basic issue here can be framed as one of relative neutrality and reasonable freedom from unacknowledged researcher biases - at the minimum, explicitness about the inevitable biases that exist'*. Questions include; whether the researcher's biases have been made explicit and whether methods, procedures and assumptions have been described. Where conclusions have been clearly aligned to data should also have been made explicit.

The initial ideas and biases about the factors inhibiting implementation developed from the implementation literature review (Chapter 2 & 3). The methods of data collection; action research, focus groups and interviews are described in chapter 4. A clear description of the method used to analyse, code and categorise the factors that affect implementation from an analysis of empirical and theoretical data is provided in chapter 8.

2. Reliability/Dependability/Auditability - *'whether the process of the study is consistent, reasonably stable over time and across researchers and methods'. 'Have things been done with reasonable care?'*. Questions include; the importance of having clear research questions, a defined research role and specifying the researcher's basic paradigms and analytic constructs are emphasised by this category. Whether data was collected over sufficiently different settings and time scales is also highlighted, as is whether data has been coded and if this coding has been verified.

The research questions of this research were defined as:

What are the factors that affect the implementation of process based change projects?

How can we develop an improved process for implementing process based change projects?

The various roles that the researcher took were agreed and defined. A description of the researcher's roles as facilitator, project manager and process consultant are described above. The underlying philosophical assumptions the researcher approached this research from, are also explained above.

Data was collected over a three year period; from three action research projects, a series of interviews and the focus groups. The data was coded to draw out the dominant themes affecting implementation. The results of this coding were verified and developed by peers and colleagues. The feedback processes have been noted in the text where appropriate.

3. Internal validity/credibility/authenticity - *'Do the findings of the study make sense? Are they credible to the people we study and to our readers? Do we have an authentic portrait of what we were looking at?'* The plausibility and comprehensiveness of the accounts is the concern of this set of questions. Questions include: evidence for use of triangulation or reasons for not using triangulation and searching for opposing explanations of ideas is the focus of this section. Evidence of conclusions validity from those originally involved is also reviewed.

Across-methodology and data triangulation were used. Different methods and types of data were collected from focus groups and semi-structured interviews (see the Chapter 8 for an explanation). Opposing and contradictory views were gathered during the interviews and focus groups and were noted throughout the action research projects. These views have been captured in the relevant transcripts (Appendix 4). The write-up of the action research projects and their outcomes were all authenticated by the sponsors of the projects.

4. External validity/transferability/fittingness - *'whether the conclusions of a study have any larger import. Are they transferable to other contexts? Do they "fit"? How far can the be "generalised"?'* This category is concerned with the fullness of descriptions, whether the limitation of the sample and the scope of the findings from the study have been discussed; whether processes developed are generic enough to be appropriate to different contexts and whether they have been tested are also noted as a concern here.

Each of the action research projects is described in detail in Chapters 5-7. Chapter 9 describes the process developed to improve the management of implementation and Chapters 10 and 11 describe a fourth action research project that the framework has been tested on, the results of the project and the application of the framework. The limitation of the research will be explained in the concluding Chapter.

5. Utilisation/application/action orientation - *'Even if a study's findings are "valid" and transferable, we still need to know what the study does for its participants, both researchers and researched-and for its consumers. We simply cannot avoid the question of "pragmatic validity"; it's an essential addition to more traditional views of "goodness".'*

This group of questions is interested in whether; the findings are understandable and useful to prospective users, if findings encourage future work, whether users have benefited from the output of the research and has the research helped solve the problem it set out to solve.

Chapters 10 and 11 report on the application of the framework to a fourth action research project. The users of the framework have been asked for feedback on whether it was useful, understandable, of benefit and helpful for improving implementation. This feedback has been reflected upon in the conclusions (Chapter12).

4.8 Conclusions

The basic philosophical assumptions that this research is founded in have been described. The importance of choosing an appropriate research method has been addressed. The characteristics of that chosen research method; action research, were explored. The validity of action research was examined and Eden and Huxham's framework for ensuring valid action research presented and discussed. The additional research methods (grounded theory, focus groups and semi-structured interviews) the researcher used were described and discussed. Finally, the Miles and Huberman guidelines for judging the quality of the qualitative data analysis were presented. The following three chapters will now go on to describe the action research that has been carried out.

Chapter 5

Action Research Project 1 - Customer Support Centres Project

To build up a thorough understanding of how process based change projects are implemented and what happens during this implementation, the researcher took part in three significant process change projects in PSS. The process changes were based around the deployment of a common set of processes in IBM's marketing and services operations. These process change projects are called Customer Relationship Management (CRM). The stated goals of CRM are to increase customer satisfaction, increase market share, reduce expenses and increase employee morale. Chapter 1 provides a fuller explanation of CRM.

The purpose of this chapter and the following two chapters is to give an overview of each of these projects. The first project investigated the processes in the IBM Customer Support Centres. The second project was about implementing a teamworking culture across PSS. The third project was concerned with redesigning a service development process. The outcomes from these projects have had a fundamental influence in the direction of the research. The following chapters will summarise the important results and the main factors supporting and inhibiting implementation of each project.

5.1 Project Background

The first project was a problem identification and problem resolution project in IBM Central Support Services (CSS). CSS consists of several groups that assist customers when their computer systems, usually mainframes, fail. Customers who purchase the breakdown and recovery maintenance services from IBM are entitled to call the support centre for assistance with queries and technical problems. When the customer reports a system failure the problems are either fixed remotely by people in the IBM support centres, or where necessary a customer engineer is sent on to the customer site to manually fix the computer system. This project was managed and run by two process consultants, one of whom was the researcher.

CSS is divided into five areas depending on the type of technology supported. These areas are:

- Enterprise software support (Enterprise technology is large scale technology; for example all the technology that requires maintenance in a chain of supermarkets stores in the UK)
- Enterprise hardware support
- Enterprise assist
- Network support group
- AS400 computer support (Mid size computer)

Research was carried out in these areas from January to December 1996.

5.1.1 Project Objective

The purpose of starting this project was to collect information about processes that were in operation in the IBM customer support centres. It was initiated by the Solutions Delivery process owner so that a business decision about whether the processes should be re-engineered or incrementally improved could be made.

The sponsor gave the project senior manager level support and commitment and acted as project representative at relevant senior management team meetings. The Solutions Delivery process owner was an appropriate sponsor as the CSS processes being investigated were sub processes of the Service Delivery process.

During 1995 it had become increasingly apparent to managers in the support centres that their processes are quite badly 'broken'. In addition to the 'broken' processes there were several other serious issues which were of concern. These included:

- There was an increasing number of horror stories and rumours being generated about the quality of the service provided by the support centres. There were very few facts to support these stories.
- There was also increasing pressure from customers who did not believe that IBM supported them well enough.
- There was lack of knowledge in CSS about how the support centres operated. Little was known about the size of the support business (whether the business was increasing or decreasing) or its productivity (number of problems handled per person per day).
- There was a problem of little communication between the different CSS technical functions.
- It was perceived that customers now wanted a fully integrated support service which

could support all their hardware, software and networking needs in one service. IBM could not provide this type of service at the time.

5.1.2 Method of Project Initiation

An initial meeting was held with the project sponsor and the researchers. During the initial meeting the following areas were addressed:

- What is the scope of the project?
- What are the major issues and concerns perceived to be in CSS?
- What is the present and what was the past structure of CSS?
- What changes have taken place in CSS over the previous years?

The project was not organised as a formal project. The goals, objectives and boundaries were not formerly defined and the project was not run by a project manager or completed by a project team. As a result of the informal nature of the project the consultants requested that the project's objectives and boundaries be reclassified with the sponsor a couple of months into the project.

5.1.3 Method of Problem Investigation

The main method of research was via semi-structured interviews (see Chapter 4). The general pattern that these interviews took was firstly to interview the managers of each area and then to interview specialists (who were identified by the manager) in each area. Six management interviews and fourteen IT support centre specialist interviews were conducted over three months. Each interview averaged two hours and they were usually informal discussions at the interviewee's workplace. Many follow up discussions also occurred as a result of these interviews.

Six managers meetings were conducted, these were the managers from the five areas under study, plus the manager of the call management centre. The call management centre receives all the customer calls and then distributes them to the appropriate support centre.

The type of information that was gathered in the managers' meetings included:

- An explanation of the structure of their area.
- Information about the process and structural changes that had occurred recently
- Problems that their area were facing
- Performance measures of their area
- Perceptions of what their key processes looked like.

Each manager of the different areas had a different view of the structure of CSS and where each department was placed in it. There was a considerable amount of confusion about who and what was included in CSS. It was thought this may have been caused by the amount of change that had taken place in CSS and the inconsistency and lack of communication about the changes.

In each area two or three specialists were interviewed so that a view of the key processes could be built up. The interviews were focused on how the key processes actually worked. The type of questions which were asked included:

- What steps are involved in the process?
- Who is responsible for which activities?
- What handovers were there in the process?
- What process measurements were there?

The interviewees were all extremely helpful and willing to describe what was happening in their areas. There was only one interview with a manager where we found a considerable amount of resentment about the work we were conducting in his area. This resentment was due to the manager's perception that we were duplicating work that he had assigned people in his area to complete previously. Over time as the researchers credibility grew and the project became more widely known about and important, the resentment decreased.

5.1.4 The Problem Handling Process

From the interviews and discussions IDEF0 diagrams illustrating each of the key support centre processes were developed. In total 19 IDEF0 models, decomposed through four levels were developed to represent the process in CSS.

Figure 8 illustrates a typical example of the process diagrams that were developed. A complete set of process diagrams is provided in Appendix 1. Each of the process diagrams was discussed with the relevant support centre specialists, manager and the sponsor throughout development. The diagrams were revised accordingly until all parties involved were happy that the IDEF0 models were a fair and accurate representation of the process in use.

5.2 *Results from the Process Investigation*

There were several immediate problems that became apparent to the consultants from the process investigations and analysis. Several of the more important problems were:

- Functional specialisation meant that it was very difficult to define end to end processes, such as, customer call to problem resolution.
- Functional operations meant there was no ownership of the whole process. Many managers owned parts of the process.
- There was a series of high level ambiguous hand-offs. Typically when a problem was passed to different functions it was not clear to whom or to where the problem should go. For example a hardware fault could be logged at the call management centre and then passed to the engineer via voice message, pager or email. The call may also be passed to the enterprise support desk. Often confusion was caused with both an engineer and support desk calling the customer or the support desk calling the customer whilst the engineer is fixing the machine or even after the machine has been fixed. There is also ambiguity about which centre dealt with which calls. For example, the Network Support Group, AS Assist (Mid size computers support centre) and ESSG could all deal with networking problem calls.

In many cases there was no core process that everybody in the function used. It was more

common to have several variations to deal with similar processes. The activities were rarely described as a process or in customer terms. Most groups described the process differently and placed different emphasis on different parts of the process.

Processes had not been documented. Usually if a particular sequence was followed it was held in the head of the employee who carried out the process. Many of the support experts relied on years of experience in the field to enable them to fix a problem. The mental processes that were very important to successfully solve a problem were not documented.

The inconsistencies in the process architecture meant that gaining measurements that matched up across the whole process was difficult. Measurement of a process from end to end across functions was not possible. There were very few measures available; support staff were unaware of how long it took to complete procedures and processes. Available measurements were generally concerned with customer satisfaction, rather than process performance. One of the consultants said he was 'struck by the lack of interesting or useful data that people have to hand'. There were no consistent measures across the different CSS functions. Measurements taken were produced in various formats, such as bar graphs, line graphs, figures.

5.2.1 Management Report

These results were detailed in a report which was submitted to the management committee (July 1996). The report included results of the interviews and key issues from the process diagrams and made recommendations in the six areas of strategy, human factors, information technology, performance measures, scope of change and process architecture.

- Strategy improvements were divided into short and long term recommendations. These improvements included identifying customer requirements, benchmarking with the competition and identifying core competencies.
- Human factor improvements were to complete a cultural audit the results of which should be compared with the strategy of the business so that an assessment of whether they are in line can be taken.
- Information Technology recommendations included making an assessment of innovations in the support areas and where they are or can be co-ordinated.
- It was recommended that performance measures should be connected to a set of goals.
- The scope of change that is taken in the support centres was recommended to be radical.
- Recommendations for a process architecture with clear boundaries and objectives were put forward

Immediate short term recommendations included putting new robust processes in the Hardware Support Centre (HSC). Other long term radical improvements included introducing a standard set of process measurements across CSS and developing a five year strategic plan for CSS.

A few weeks prior to the submission of the report, a new manager was put in charge of CSS. The report was presented to the new manager in a two hour meeting. The work was

accepted as being very useful, particularly as it had been carried out by a research team that was seen as independent of IBM. However the results of the work were not received with enthusiasm. The new manager was not familiar with the process analysis and investigation work that the consultants had carried out, so was sceptical of the consultants' credibility. The new manager had different priorities and objectives and most importantly, less commitment to the project. The new manager did not appear to value the findings of the report as highly as the previous manager. The new manager wanted answers and solutions to the problems in the area, not what he could do in the long run. This meant that the findings from the report were not taken forward with as much commitment and enthusiasm. However, the sponsor, (who was a higher level manager than the CSS manager) supported the work wholeheartedly and project work continued.

5.3 Further Project Work - Hardware Support Centre (HSC) Sub Project

As a result of the project findings it was decided that resources should be focused in one area. This was the HSC. A project team was formed to deal with this project. The team included the Manager of the HSC, two senior HSC specialists and the two process consultants.

A project definition workshop was held to define the goal, objectives and scope of the sub project. The goal of the project was *'to clearly define a process that will be committed to, would improve service, decrease cost and increase efficiency'*. Specifically the project would address the call handling problem where both the engineer and support centres are notified at the same time about a customer call. This causes duplication of calls to customers and in some cases leads to an engineer arriving at a customer site when the problem has already been fixed remotely by the support centres. This makes IBM look inefficient and unprofessional.

The objectives of the project included:

- Detailed process analysis and design, from calls (manual or automatic) to fix, to include both engineers and the call centre.
- Benchmarking the process with other UK and European support centres.
- A review of statistical information which is required about the processes.
- Evidence of how good or bad the current process is, gaining different perspectives from engineers, customers and employees.

The scope of the process was to include every activity from receiving a customer or machine call right through to problem fix.

5.4 Project Progress

In November 1996 an organisational structure and a PSS management structure reorganisation began. Many projects in progress in PSS were put on hold whilst a review of the business was completed. The HSC project was amongst the projects put on hold.

This project was eventually superseded in February 1997 by other projects that were perceived to be more in line with the new management strategy for PSS. The HSC project did not progress any further than its initial meeting.

5.5 Analysis

The main factor that influenced the project progress until December 1997 was the strong sponsorship from a senior manager. The sponsor was consistently committed to the project and actively involved.

The PSS management and strategy changes led to the initial sponsoring manager moving to another part of IBM. This led to the project losing its visibility and emphasis. The new Solution Delivery manager took ownership of the HSC project, but not sponsorship.

Losing sponsorship meant that leadership of the project and senior management commitment to the project was lost. As a consequence the recommendations put forward in the management report and the project lost its visibility and emphasis this may have meant none of the suggested actions were taken forward or progressed.

The new manager said that it was not clear how the HSC project fitted into other projects and process changes taking place in PSS. The manager was also aware that how the project fitted into the new business strategy for PSS had not been considered. As a result the new manager put the project on hold whilst new PSS strategies were confirmed. The lack of official project structure may have influenced the new manager to discontinue this project in February 1997. Other projects that were perceived to be more in line with the new management strategy for PSS superseded this project.

Other factors that inhibited implementation included the lack of commitment to the process changes from the managers in CSS. The sponsor said that *"in hindsight he would have formed a team who could have worked on the process changes full time."* He felt this would have meant that project may have been taken more seriously. The lack of commitment from the managers meant that they were not easily persuaded to dedicate any

time to the project; such as time for being interviewed. In addition, information requested was often not provided immediately or willingly and often had to be demanded by the project sponsor.

The sponsor felt that the lack of communication from himself about the project could have been a contributing factor in the lack of commitment from those involved. The project and its purpose were not communicated sufficiently to employees and the managers in the support centres. This meant that the sponsor was not seen as being actively involved and committed to the project. Some employees did not believe the sponsor was truly committed to the project and in some cases this led to some employees being a little resistant and suspicious of the project. Articles in the PSS magazine and presentations to management teams could have been organised. This would probably have led to more commitment and greater knowledge about the project.

The process analysis work was not formerly organised as a project. There was no project management system in place and the business benefits and justification for the project had not been established. The sponsor stated *the "freedom this gave us was advantageous, as we were not stifled to take actions"*. However, this meant the goals, objectives and boundaries were not formerly defined and the project was not run by a project manager. As a result of the unplanned nature of the project the process consultants requested that the project objective and boundaries were reclarified with the sponsor on at least two occasions, a couple of months into the project. The project was described as suffering from *"scope creep"*. As a result of the increasing size of the project the length of time the analysis took to complete was longer than originally estimated and deadlines by which reports had to be submitted by were missed on several occasions. The project was perceived as being disorganised and the credibility of the project fell.

The second phase of the project had more formal project organisation, such as a project team to run the project. However, where the HSC project fitted into other projects and process changes taking place in PSS had not been addressed. Where the project fitted into the new business strategy for PSS had not been considered either. The new manager noticed that the project had not been set up as an official project. The lack of formal project organisation meant that the manager put the project on hold until the new strategy for PSS had been confirmed.

The sponsor commented that *"there was too much change"* and that PSS *"did not give changes a chance to produce the benefits they were intended to generate"*. The sponsor felt that *"change needs to be in place for a number of years before benefits begin to be produced"*. Typically, a change project had taken place in each support centre in the previous 6-12 months and already new changes and alternative approaches were being considered. This meant it was difficult to gain commitment to the project as it was perceived that another project would superseded it in a few months time.

5.6 Conclusions

This project was not completely or successfully implemented. No process change was implemented and the project only progressed as far as the process design phase. By this stage the project had undergone a considerable and successful analysis phase.

As a result of not implementing the project the predicted benefits of the project were not produced and the cost of carrying out the project was not recouped. The wasted cost of this project would have included consultants and interviewees time. 30 days consultancy time was contracted for 2 consultants at a cost of £30 000. No other direct costs were associated with the project. Additional cost were in wasted interviewees time, which amounted to approximately 56 hours (20 interviewees x 2 hours = 40 hours, 5 follow-up interviews x 2 hours = 10 hours and 6 interviews with the project sponsor = 6 hours).

As a result of the lack of formal project organisation, sponsorship of the project was not gained from the new manager. Losing sponsorship meant that little occurred as a consequence of the recommendations put forward in the management report. Several people who knew about the existence of the process diagrams and the report asked to see the documents or used them for input to their projects, but essentially the project was archived. Indeed, the sponsor was noted as saying that *"after the results were submitted very few, if any of the findings were acted upon"*. This project was not completely or successfully implemented.

Chapter 6

Action Research Project 2 - Teamworking Project

This project took place over eighteen months, from February 1996 to August 1997. It was a project to implement teamworking processes across PSS.

Teamworking is the practical application of the concept of process. It is the way work is done based upon the theory of the whole process. Indeed, Pall (1987) defines a business process as, 'the logical organisation of people, materials, energy, equipment and procedures into work activities designed to produce a specified end result.' In addition, teams are important to process change as generally teams implement the process (Turner 1995, Bashein et al. 1994). Teams are also a crucial element of the implemented processes, as it is usually teams that operate, support and manage the new process (Kaplan and Murdock 1991). Indeed, Wellins, Byham and Wilson (1991) define team working as 'an intact group of employees who are responsible for a 'whole' work process or segment that delivers a product or service to an internal or external customer'.

Organising work from the viewpoint of the whole process involves teamwork across and between departments boundaries (Earl 1994). Large-scale increases in productivity and profits are claimed for eliminating divisions of labour and implementing teamwork.

6.1 Project Background

The second project was a project to implement a teamworking culture across PSS. A project manager was assigned to run the project. The researcher was assistant project manager, a member of the teamworking project team and a fully trained and practising Team Advisor (TA). The project ran from February 1996 to August 1997.

6.1.1 Project Objective

The aim of the project was to provide PSS employees with the necessary skills and knowledge to work together and eventually create a high performance teamworking culture.

6.1.2 Project Management Structure

A project team was formed in July 1996 to help complete project work. The project team members were the project manager, sponsor, a first line manager, the researcher and several other professionals from across PSS. Monthly team meetings were held to track the project progress.

The project's goals, objectives, scope, risks, dependencies, assumptions and a project plan were defined in the first project team meeting. Four sub-projects were defined in this meeting; to develop a communications plan, to develop a measurement system, to write a business case and to set up a team advisors network. Sub project teams were formed to manage the implementation of these sub projects. The actions and milestones of the project were assigned owners and deadlines for completion.

The project manager was given a finite time of a year to work on the project. By this time the sponsor and senior management wanted the project to be self sustaining, so that it would not require direct monitoring and management. The principle was that if the right

people were involved, teamworking would become part of the culture and would therefore not need any specific project management, only a sponsor.

6.1.3 Business Case

In order to guarantee funding and support of the teamworking project the commitment of the PSS director had to be ensured. A business case was developed for presentation to the director.

The director did not give his complete commitment to the project, as he was not convinced that the possible benefits to be gained from the project would outweigh its costs. The director wanted to know exactly how much money would be saved or made from implementing the project. Teamwork is a difficult concept to quantify and it would be difficult to assign any decrease in cost or increase in profit directly to the implementation of teamworking. However, the director believed in the benefits of teamworking, so agreement to fund the project was gained.

6.2 *Teamworking Advisors' Network*

The TA network was the main method of implementing teamworking processes across PSS. The TA role involved working with a team and its sponsor to transfer and enhance teamworking skills. The tasks the advisor would carry out include:

- Assisting with the effective growth of teams and teamwork within the business.
- Becoming a centre of knowledge of our selected teamwork principles and practices.
- Act as a communication conduit for knowledge and consistent information related to team successes within the community.
- Help promote the culture of sharing knowledge and best practise.
- Assisting with the delivery of the CS Teamworking Project.
- Performing 'Team Doctor' role for dis-functional teams.

- Focusing on team's process, not the end result or specific content.
- Assisting team leaders in identifying and implementing effective teamwork tools and techniques.
- Preparing training modules for team growth
- Observing team meeting and providing feedback.
- Transferring skills to teams and managers.

The TA network sub-project team completed a number of activities to implement this network. Work included arranging a number of TA launch meetings to recruit TAs, arranging the initial network meetings and planning TA training.

Through a selection routine around 20 professionals were recruited for the initial TA training program. The people recruited had either shown interest in the project or had been nominated by their manager. It was ensured that the professionals that were chosen to be TAs were geographically dispersed across the whole of UK, and covered most areas of the business. The TA network consisted of four teams of TAs who worked across the UK to transfer these skills.

The Team Advisors Network was launched in September 1996. The purpose of the launch meeting was to gain commitment to the project from the prospective Team Advisors. The first meeting of the network and the training was carried out in January 1997.

Eight days training for 26 TAs took place at the end of January 1997. The training course and materials were provided by a teamworking training consultancy. This company was chosen as it was they were the consultants used by IBM Canada when they implemented a teamworking culture six months previously to IBM PSS-SD in the UK. The company were considered to be of a very high standard and would be able to offer a consistent training

package across IBM world-wide.

The first three days of training were called Team Tools, the second week of training consisted of five days of TA Training. The first three days of the course consisted of learning about 18 team modules which could be presented by a TA to help a team develop. The modules focused on developing a team and the individuals in the teams. The modules covered a multitude of subjects, such as creating a team charter, giving and receiving feedback, tools for problem solving and managing team conflict. Depending on the stage of team development different team tools modules would be used. The second week of training was based on presenting the theories and models which underpin the team tool modules.

The majority of the TAs felt that the training was comprehensive and a very high standard. However they had several reservations about becoming team advisors. There was concern with the lack of visible top management commitment to the TA network and the teamworking project. The TAs did not feel that the sponsor was an active, participating member of the teamworking project. This was evident with non attendance at TA and teamworking meetings and lack of communication to the PSS about teamworking. This was a major concern as the TAs felt this lack of commitment was jeopardising the project as their managers would not support the project if the sponsor did not.

The TAs were concerned about the amount of time that they would be required to spend working with teams. Many of the TAs were already extremely busy with their 'day job' without accepting additional work. There were also concerns with funding of expenses, such as travel and hotel, that would be incurred when carrying out a TA engagement. IBM has a high emphasis on constraining expense therefore managers were highly dubious about spending money on their employees' carrying out TA activities which were not

directly related to their areas of the business.

6.3 Measurement sub project

It is important when a process change is implemented that the improvements in process performance are measured (Von Bonsdorff and Andersin, 1995). A sub-project to monitor the changes in performance of PSS employees as a consequence of the teamworking project was defined.

The sub project team defined several measures relevant to monitoring performance; number of teams in PSS, number of TA engagements, TA time spent performing role per month, number of TAs and where they were located, TA team morale, customer satisfaction with TAs, TA education. A database was developed where all data could be collated and analysed.

6.4 Communications Sub Project

A communications sub project team was formed to manage the teamworking project communications. Internal communications between the TA Network, teams, project team, sub-project team and external communications to PSS required managing.

The communications sub project dealt with the four main issues. Firstly, it was perceived that the commitment to the teamworking project from the first line managers was not as high as required and that many of these managers were just paying teamworking lip service. It was felt that the lack of commitment was due to a lack of understanding of why teamworking is required and what the project involves. Secondly it was perceived that there was a need to communicate to the second line managers about why teamworking is required. Of the 12 second line managers the majority were bought into teamworking, but were not seen to be visibly espousing the benefits of teamworking or encouraging the teamworking environment in their organisations. Thirdly it was felt that communication of

the TA Network would increase the number of teaming engagements for TA's. Finally, it was felt that mechanisms to improve communications between the TA network, Teams project team and between the TA hubs were required.

It was decided that as many communication media as possible would be utilised. Media included electronic mail, shared information databases, articles in the PSS company magazines and presentations in team meetings and management meetings.

The first article about the teamworking project and TA network was published in the IBM UK monthly 'Winning Team' (1997) magazine in an article called 'Growing a teamworking culture'. The article gave an update of the teamworking project and announced the availability of TAs in PSS. This article raised the awareness of the TAs. Several additional TA engagements were booked in half the IBM locations as a consequence. However, over the initial months of the TA Network it was found that the best method of gaining TA engagements was through word of mouth and personal recommendations.

To deal with the problem of lack of commitment from second line managers a series of one to one discussion sessions were carried out between the teamworking project manager and the managers. In some cases these sessions went very well, but this was generally with the managers who were already actively involved and committed to teamworking. Other managers remained sceptical about the benefits to their area of the business from teamworking. The main change in their commitment of these managers came when the director of PSS began to communicate and show his commitment to the teamworking project. Once this change in top management commitment became visible the first and second line managers began to exhibit similar behaviour.

The solutions to the problem of communicating between the TA Hubs and through the network were solved by setting up a teamworking database where all teamworking related information could be sent. A distribution list of all TA's was set up so that the teamworking userid could send information out to all TA's. The teamworking project manager filtered and managed all the information which was received and distributed from this id. Communication between the hubs was solved by setting up to quarterly hub meetings.

Communications to PSS were important, as there was lack of commitment to the project from the first and second line managers. The perception was that lack of commitment was due to a lack of understanding of why teamworking was required and what the project involved. To deal with this problem a series of one to one discussion sessions between the project manager and the managers took place. Generally, where managers were already actively involved and committed to teamworking the interviews were successful. Other managers remained sceptical about the benefits of teamworking to their area.

6.4.1 Six Month Planning Meeting

The project team reviewed project progress in February 1997. All actions were on time and up to date except for the sponsor's actions. This was perceived as lack of genuine commitment from the sponsor.

The first half of the meeting was spent reviewing actions from the previous meeting. The latter half of the meeting was spent developing an action plan of how the project could be fully implemented in the following six month before the project manager was due to leave. A discussion took place about where the teams project was currently and where it needed to be by July 1997 and what we had to do to get to this desired situation. It was felt that the current situation of teamworking in PSS was as follows:

1. Teams project has a sponsor
2. Teamworking is viewed as another management 'fad' in some areas
3. We consciously form teams to comply with current expectations.
4. Mainly external evidence that teamworking improves the business. (Some limited example from within the PSS UK).
5. Ownership and responsibility for teamworking resides with the sponsor and the project manager.
6. Teamworking is viewed as optional in some areas.
7. We have a GROUP of TA's with low experience that have little authority power, influence BUT some respect and credibility.
8. workgroups identified and engaged with the TA's.
9. We don't share experience and knowledge effectively with other teams and the rest of IBM.

The project team also decided where they believed the teamworking project needed to be in six months, in order for it to become self sustaining, which was:

1. The director of PSS to be an active sponsor.
2. Teamworking is a recognised way of problem solving within PSS.
3. Teamworking is the way it will be in PSS, in support of Team-IBM strategy.
4. Improvements in operational measures prove teamworking is effective as a problem solving methodology.
5. Ownership and responsibility for success of teamworking resides with the Service Operations Committee and the director of PSS.
6. Ownership and responsibility for execution of teamworking resides with everyone within PSS, measured through PBC's.
7. A growing team of experienced TA's that have the respect, credibility, authority, power and influence to do the job of a Team Advisor.
8. Workgroups have become teams where TA's are engaged.

A series of actions were developed which would facilitate moving PSS teamworking towards the desired state described above.

1. Sell the benefits of Teamworking to the director PSS and gain his active support. Declare public commitment to being the sponsor.
2. Specifically identify a number of potential teams to demonstrate the benefits of teamworking.
3. Define the role of the sponsor
4. Gain the commitment and active involvement of the sponsor, who preferably will be the director of PSS.
5. Gain commitment to the project from the management committee. Agree how they will progress and encourage the growth of teamworking after July without a full time programme manager.
6. Encourage the use of TA's by promoting the role and advertising TA's availability.
7. Provide encouragement and mentoring to the TA's.
8. Develop a two-way information gathering and feedback process for TA's and their activities up, down and across the PSS organisation.

The team noted that if the actions listed above were completed by September 1997, the progress of PSS towards a High Performance Teamworking Organisation will move further along the road to becoming a self-sustaining project that will not require managing or leading. The primary people involved in this work would be members of the TA Network in partnership with the sponsor and the director of PSS.

The project manager was contracted to work on the project until July 1997. A replacement project manager was not being provided, as the sponsor believed the project should be self sustaining. A project plan to complete the remaining project actions by July 1997 was developed. Where the project needed to be by July and what actions had to be taken to reach this desired situation were discussed.

The project team agreed that the best approach to develop a self managing project was to establish a strong TA network that was supported by a committed and encouraging sponsor. Actions to address the lack of sponsorship and leadership were taken.

A second problem of little second line management commitment to the project was also raised as a concern in this meeting. The project manager said that a *"leap of faith"* was needed from the second line managers, but no one was prepared to *"put their energy behind what they wanted to happen"*. The teams project was not on the *"usual business agenda, it was human stuff which could not have a direct measure on it. The director of*

PSS was running a tight ship with very little room to manoeuvre. Targets and goals were very clear and precise, so it was very difficult to deviate and be creative and imaginative”.

The managers also misconceived the purpose of the teamworking project as removing some of the responsibility of their role. There was a fear that teamworking “*was a means to streamline*” the first line management. The project manager felt that first and second line managers “*needed coaching so they could see the positive things about teamworking, such as allowing them to spend time on far more productive things and take a wider view of the operation*”. Additional actions to address the lack of management commitment were taken.

6.4.2 TA Network Review

In July 1997 a TA network meeting was held to assess network progress. This six month review coincided with the teamworking project manager moving on to another role in IBM.

Prior to the review a questionnaire was sent out to the network to assess how active the TAs were in this role. Three questions were asked, Do you intend to attend the meeting? Do you still wish to be a TA? Are you actively Team Advising? As a result of work commitments, six TAs had decided to resign from this role. About 50% of the TAs said that they were actively engaged with some teams. All of the present 26 TAs were invited to attend the meeting, half claimed that they would attend the meeting, however only six were present.

As the project manager was leaving the role, several key issues required addressing in the review. These issues included finding a replacement to take on the responsibility for the tasks the project manager carried out, such as the captain of the London and South East TA

network, providing a single point of contact for the TA Network and being a representative of the TA Network to Senior Management. It was decided that the future direction and mode of work of the TAs and the handling of the network operations after the departure of the project manager could not be decided until the sponsor could provide the answer to several important questions. The sponsor was asked to confirm whether:

- The TA Network was still compatible with the current PSS strategy?
- What will the sponsor do to promote and revitalise the network, as in its current state it will almost certainly wither and die?
- How will the financial and time issues affecting the network be resolved?

The sponsor responded to the Network in a e-mail note to all TAs. The reply stated there was a great deal of sponsorship in PSS for teamwork. It was also stated that the management did not want the investment that had already been made in the network and the tools provided to be wasted. The sponsor was committed to completing the actions that had been placed on him and to meet with each of the network team leaders. Unfortunately the sponsor did not complete his actions or speak to the network team leaders.

6.5 Project Progress

The TA network was founded at the beginning of 1997. TAs began work as soon as they were trained at the beginning of February. Following the launch of the TA network the number of teams who utilised a TA increased noticeably. The TA network established itself, regular meetings and support between TAs grew. Credibility of the TAs and the network grew slowly. Two management teams used the services of a TA this helped to improve the networks reputation.

By the time the project manager left in July 1997, groups that had requested TAs had begun to adapt their processes to work as teams. The introduction of teamworking meant that many of the processes that were in use required adapting so that they were appropriate for use by teams rather than individuals. There was evidence of engineers starting to look at their processes and several new teams had been formed.

When the project manager left the project a replacement project manager was not sought. The director's management team were given responsibility for the project. Once the project manager left the project TA network activity declined rapidly. Often TAs found it difficult to find spare time to be able to carry out TA related activities. There was no TA activity after autumn 1997.

6.6 Analysis

Senior management commitment was critical to the success of the project. There was an evident lack of commitment to the teamworking project from the director of PSS even after a business case was submitted and was accepted as being valid. For example there was no communication about the project from the director, team advising services were never requested for the directors' management team and continued funding for a project manager was not provided. As a consequence, this lack of commitment filtered down through all layers of management. The project was not seen as being on the business agenda, so it was difficult to justify the time of personnel who were working on the project. Lower levels of management could not support TA activities if not advised to do so by senior management. In addition, the motivation and moral of the project team and TAs was affected by the scarcity and inconsistency of support.

The lack of behaviour demonstrating senior management commitment to the project was mirrored by the sponsor. The sponsor's commitment to the project was inconsistent. At the beginning of the project the sponsor would attend team meetings and complete his assigned actions. This level of involvement decreased as the project progressed. This hampered project progress and possibly stunted the growth of the network. The morale of the project team and the TAs declined as the sponsors active commitment declined.

The inconsistent sponsorship and lack of management commitment were evident through all layers of management. There were problems with gaining the commitment of the first and second line managers to the project. In some cases managers would say they were committed to teamworking but in practice they showed no evidence of this commitment. As a result the project progress was restricted and the growth of the network suppressed further. Lower levels of management could not support TA activities if not advised to do

so by senior management.

Introducing teamworking processes into PSS was very difficult. There was a deep rooted *"individualistic"* culture at IBM. Employees tended to work individually rather than in teams and tended not to share information freely. Competition between employees was encouraged particularly in roles such as customer engineers and salesmen. Rewards and recognition's reflected this. Frequently employees found it difficult to change from working individually to in teams. A thorough analysis of this problem situation had not been carried out. As a result the existing culture and influence of the IBM working ethics had not been understood by the project team.

The project manager felt that the project team had been *"a bit naive by thinking we could change the culture. We had to change this small part of the culture, but this was part of a bigger culture. We needed to change the culture of PSS but PSS was within IBM culture, which has an over powering influence."* As a result of not completing a thorough analysis of the problem situation the complex cultural influences were not understood.

The project manager also felt that the team did not *"fully understand what they wanted to change"*. The team understood that teamworking was an underlying behaviour, a way to work and how to relate to each other, but they did not realise that this involved changing organisational culture. This meant the project was organised as a discrete one year piece of work. Once the project manager and team realised, the way people work cannot be fundamentally changed in a year it was too late to change the project timescales and gain the additional funding and management commitment.

The formal project management system and project team was not set up until six months into the project, once the project manager's role had been clearly defined. The project

manager felt that he *“should have got a project team set up straight away”*, as once the project team and project management system was set up, I *“things started to happen”*.

The project manager was extremely dedicated to the project. His enthusiasm and commitment to the project was a major factor in the project implementation that occurred during his year of co-ordination. His consistent commitment encouraged the project team and ensured the project progressed as planned.

The removal of the project manager at the end of his year contract led to the demise of the formal project management structure. The measurements and communications sub projects were unmanaged, network team meetings and communications declined. This led to a fall in the morale of the TAs and a loss of direction for the Network. The project manager felt *“not providing a replacement project manager, just as the network was beginning to become established was a mistake”*.

The efficient and effective teamworking from the project team was a main factor that led to the process changes being implemented until August 1997. The project manager described them as *“a committed team who were all dedicated to the cause”*. Forming a cross functional project team also helped to *“get buy-in from different parts of the organisation”*. The project team ensured all the objectives and actions were completed on time and to budget. The team was also helpful in confirming that the project was going in the right direction. The project team members' motivation meant the project implementation gained momentum and kept to tight deadlines and schedules.

Articles were published in the PSS magazine and many presentations were made in management team meetings to advertise the TA network and the team's project. Many of the TA engagements were arranged as a consequence of these communications. However,

there were not as many communications about the project as required and the project was not widely known.

The benefits that teamworking could offer PSS were poorly communicated. The project *“needed top management to cascade information down through the organisation”*. The project manager said that *“like any project, you have people who sell the project and people who do the project”*. The project was lacking people to do this. In hindsight the project manager said that a *“marketing person should have been employed to sell the project to the organisation”*. The lack of communications meant that commitment to the project was not encouraged, as little was known about the project.

The TAs that formed the network came from different geographic locations and areas of the business. This meant that knowledge about the teamworking project began to spread across PSS. It also meant that representatives from different user groups became involved in the project. This increased commitment to the project when the TA network was first established. This commitment declined as management support was not provided for the TA activities.

How the project fitted into other process changes or strategies occurring in PSS and IBM had also not been considered. The business environment had changed since the introduction of the teams project. The PSS organisation was restructured. This led to the teamworking project being suspended whilst projects that were focused on PSS strategic work took higher priority on the management committee’s agenda.

Another barrier to implementation was the perception by some employees that teamworking was just the *“latest fad”* to be introduced and if ignored it would soon be over. An interviewee said that *“management project initiatives are almost viewed with*

suspicion, people are used to constant change and a new initiatives each year, there is a feeling of they didn't see the last change through, so why is this one going to be any different?" This meant the project was not perceived as critical to the business or relevant to those who were required to make changes. This made it even harder to gain commitment to the project.

6.7 Conclusions

The sub-projects were completed and all objectives of the project were achieved.

However, the implementation was not successful. The benefits the project set out to create, such as large scale increases in the efficiency of engineers working in PSS were not produced. Users did not use the teamworking processes. The TA activities dwindled steadily once the project manager left. All TA activities were discontinued in Spring 1998.

As a consequence of the project not producing the benefits predicted the wasted cost of not completely implementing the project was considerable. Providing the 2 weeks TA training for 27 TAs cost £30 000, plus the accommodation and transport costs for 28 people. The cost of the project team and TA time should also be taken into account. The wasted time includes time taken attending team meetings, completing project work and time taken in training. There would also have been wasted cost and time associated with the database development.

There were several factors that inhibited the implementation of the project. The loss of project manager, inconsistent sponsorship and lack of commitment from the director, sponsor and other managers meant that there was no enforcement or incentive to use team processes. This meant that the processes did not become established and ultimately meant they were not successfully implemented. Overall the project manager said there needed to be *“more heads focused on the project, it needed higher visibility, it needed to be seen as important and it required sponsorship from the director of PSS”*.

Chapter 7

Action Research Project 3 - Service Development Project

The third project was a process re-engineering project of the solutions design and delivery sub-process, called services development. A steering committee was formed to lead the project. The steering committee consisted of representatives from each of the business areas that would be affected by the process implementation. Two facilitators were asked to join the team to manage the meeting process and provide process re-engineering advice. The researcher was one of these facilitators. The project ran from April 1996 to January 1997.

7.1 Project Background

The process to be re-engineered assessed IBM's capability to offer hardware, software, networking and enterprise (large mainframe computers) servicing for non IBM products.

The project was initiated for several reasons:

- The processes had become outdated.
- The processes were focused on service cost planning and not service development.
- There was no consistent process in place. Each user completed the process according to personal working preferences and styles.

There are several benefits of re-engineering this process. A complete end-to-end process for service development would be identified and established. Creating this process would lead to an increased understanding of the process, its resource requirements and the training and education needs.

7.1.1 Project Objective

The project vision was for the software, hardware, networks and enterprise processes to be combined into one generic process. Each of the areas dealt with a bid in a slightly different way, although one process could be appropriate to all. A generic process would mean better utilisation of service development personnel, as they could deal with a bid from any area in addition to their own specialism.

7.1.2 Project Initiation

The first project meeting was held in Warwick in early April 1996. The main objectives of the meeting was to gain commitment to the vision of one process and to develop a high level understanding of the processes that currently exist. The key issues and problems of the processes were also identified and discussed.

The facilitators used this meeting to introduce the process modelling tool LOVEM. The steering committee decided that the modelling tool could be very useful and of benefit to the project and agreed to use it. The facilitators also used this meeting to begin team development activities such as, deciding on team members and roles and responsibilities.

7.1.3 Team Meetings

By the next team meeting one team member had left the team and several more appropriate members had joined. All areas of Services Development were represented. This meeting was used to bring the new members up to date with the progress and decisions already decided on. Remaining time was used to start modelling the existing process.

The models were drawn on foils on an overhead projector, using LOVEM (Line Of Visibility Enterprise Methodology) semantics. Each step of the process was discussed in turn and agreed on by consensus. It was decided that the process consisted of three distinct phases of; request for new product or service, monitoring and reviewing product or service, managing product or service to end of life. By the end of the meeting part of the generic process model for phase one had been completed.

Future project team meetings were held monthly and were facilitated by the researcher. At the meeting updates on modelling that had been done since the last meeting were given. There were usually several areas of disagreement which required discussion, such as what an activity should be called or what an activity involved and what role should carry out the activity. The meetings were workshop based, so changes to the models were agreed and then modelling of the rest of the process continued.

7.1.4 Training

The team had not used LOVEM before, and in most cases had not even heard of it.

However they were willing to allow the facilitator to guide them through the methodology.

For the team to progress as quickly as possible with the modelling of the processes, it was agreed that education in the LOVEM methodology should be provided.

Funding to send the team on a training course was unavailable. Instead two team members learnt how to use the tool through practical hands-on trial and error and training from the facilitators. The members of the team who were not trained in the software drew their process models and updates on paper. The members who could use the software updated the diagrams from these paper based models. This was time consuming and constrained the team.

7.1.5 Phases of Project

The team felt that in order to keep the project on track a series of deadlines and phases for completion of major project objectives should be set. The development of the project was therefore divided into the following three phases:

Phase 1, to be completed by 30/12/96

- Job Level diagrams to be produced for develop new product phase and out of line situation phase of the process
- Installation of LOVEM software on the Local Area Network (LAN).
- Presentation of end to end working models at department meeting on 10/12/96
- Education to steering committee of LOVEM software.

Phase 2, to be completed by 11/01/97

- Development of end of life phase of process
- Education of end users on LOVEM software (by 31/03/97)

Phase 3

- Implementation of the workflow software to support the process.
- Implementation of the groupware technology to support the process

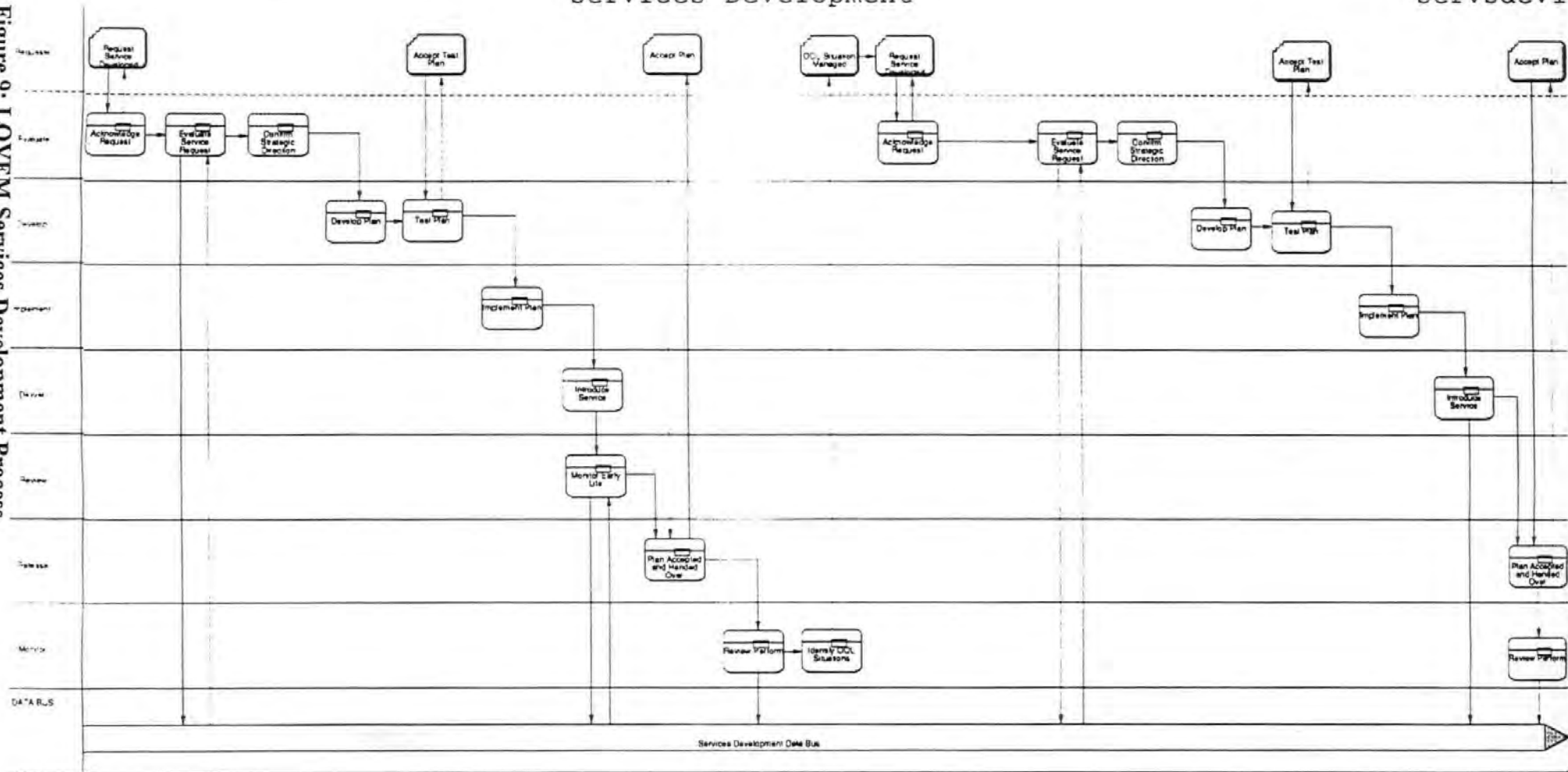
7.2 The Service Development Process

During the first couple of workshop meetings the top level logical process diagram was developed, as illustrated in figure 9. The process model underwent a number of revisions until the final top level process was agreed upon. The final process diagrams and an explanation of the processes can be seen in appendix 2.

Services Development

Servsdev1

Figure 9: LOVM Services Development Process



During process analysis stage of the project, it became very clear that there was much classic functional specialisation. The process that was being analysed was limited to the part of the process that was dealt with in Services Development. The interactions with other functions were not examined. Where the processes inputs came from and where its outputs went were not considered. As a result of the functional specialisation there were many different owners for different parts of the process and no single process owner.

From the process analysis process models were created. The current processes had not been documented before. There was no core process, more common was that there were several variations of how to deal with similar processes. Usually if a particular sequence was followed it was held in the head of the professional who carried out the process. There was much inconsistency on how the processes were described by different people and few people described the process in end-to-end terms.

The inconsistencies in the process architecture meant that gaining measurements that matched up across the whole process was difficult. There were few process performance measurements available. Measurements were generally concerned with topics such as customer satisfaction, rather than process related; such as cycle time.

The process models developed were of current processes with a few enhancements. The processes were not radically or fundamentally redesigned. The project became a process analysis and process automation exercise rather than a process redesign or re-engineering exercise.

7.2.1 Process Development

The next stage of the project was to decompose the process into more detailed sub processes. Each member of the steering committee was charged with developing the models relevant to their specialism. These models were developed by sub project teams formed by members of the steering committee.

The teams developed the models in-between steering committee team meetings. The developed models were presented at these meetings and they were checked for their validity. This involved checking that all inputs and outputs were consistent across the decomposition.

It was intended that the final process and its decomposition would act as a prototype process. The prototype once tested and refined by the users would be implemented into the organisation.

7.2.2 Supporting Technology

Once the process modelling had been completed it was realised that the most dramatic improvements in the process could only be gained by major investment in an IT solution. For the process to become automated and for people to adhere to the new process, workflow software was required.

Once this requirement had been realised all resource that dealt with designing and installing new technology had been assigned to other major IBM strategic IT projects. The supporting technology could not be developed, so process change implementation progressed no further.

In order to gain completely successful implementation of the services development

process, workflow technology was required. Workflow technology would manage the sequence of the process activities. It would then manage the flow and route that work took through the process. Workflow software would ensure that users adhered to the process rather than working to their own preferred process.

7.2.3 Project Progress

Project phases one and two were completed on time. In December 1996 a department meeting was held. One of the items on the agenda was the progress on the services development project. A presentation about the process and a demonstration of a possible software solution took place. The department were committed to the project and excited about its potential.

At the beginning of January 1997 PSS a management restructuring led to a new manager being assigned in Services Development. This new manager took over the ownership of the project, but not sponsorship. The new manager did not view the project as high priority. Work on the project gradually dwindled until eventually the project was put on hold as all projects in PSS were reviewed as part of management restructuring.

7.3 Analysis

The project had evolved from the original manager's perception that the current process needed improving. There had been little problem investigation and little assessment of alternative approaches to solving the problem. This lack of initial problem investigation meant that the financial, human and IT resource requirements for the project had not been addressed at the beginning of the project. As a result, it was not realised until six months into the project that the most dramatic improvements in the process could only be gained by major investment in an IT solution.

By the time this had been realised PSS had been placed under expense constraints. This meant the procurement of the technology required to support the process was not possible. Had a thorough problem identification and assessment been carried out at the beginning of the project, the facilitator felt that *"all the requirements for the future would have been known"* and the IT requirements may have been realised and defined earlier. Finance may then have been approved before the expense constraints and information systems developers time could have been booked. It might have been possible to implement the process completely.

The sponsor was committed to the project; however, the project team felt that he should have got more actively involved, such as attending team meetings. The team interpreted the lack of active involvement as a decrease in the sponsors commitment. This meant the project team's commitment to the project began to diminish.

Alternative solutions to improving the efficiency of the department were not considered. Before the problem situation had been fully investigated the sponsor had already decided that LOVEM process modelling tool would provide a solution to the problem. This may

have meant that the most appropriate method of problem solving may not have been chosen.

At the beginning of 1997 the sponsoring manager left IBM. The new manager had different objectives for Service Development that did not include this project. This meant that the top management commitment to the project was lost. The facilitator said that *“a change in management led to a change in focus away from the project.”* In addition a new business strategy for PSS had been introduced. This strategy had more emphasis on revenue and measurements than teamworking and BPR. This meant that the process change project decreased in importance.

The team facilitator said that a *“fundamental element that was missed out was the project definition workshop and understanding the scope of the project”*. No formal project management system was used to track this project. No project manager was assigned and the goals, objectives and scope of the project were not defined. The lack of a formal project management system had several repercussions; the project was not defined in enough detail, there was no consistent view of the project objectives or what stage the project had reached also, there was no formal project documentation and no business case. This did not give the project much credibility and meant the project was perceived by the new manager as being unorganised. This was probably a contributing factor in the new manager placing the project on hold whilst the PSS operations were reviewed.

“The sponsor should have considered how his idea for a project would fit into the overall strategy of PSS”. There was little overall assessment of whether this idea was consistent with overall PSS strategic technical, financial and process changes. This meant that the project was not co-ordinated with other projects that were taking place in PSS or IBM. In the long term it also meant the project did not have much credibility with the director and

the management team.

The lack of project management may also have lead to the project not being co-ordinated with other relevant projects, or with PSS business direction and strategy. The new manager noticed this lack of co-ordination. As a result the project was put on hold whilst an analysis of the PSS operations was carried out. The eventual result was that the new manger had the project closed down and other projects that were more in-line with the new PSS strategy took over.

The progress of the project was kept to target by producing a simple project plan. However, the actions to complete the project had not been developed in detail. As a consequence the time taken to complete actions had been under-estimated. This meant it was difficult for the project team to keep to the timescales that had been set. As a consequence motivation of the project team tailed off as the project kept missing its arranged time-scales.

Each group of users that would be affected by the process change was represented by a member of the project team. The project lacked official publicity such as articles in the company magazines and presentations to user groups and department meetings. The sponsor did not cascade project information down through PSS. There was no regular project report which could be distributed to all those affected by the change. The lack of thorough and consistent communication about the project meant that the eventual users of the process change had not been involved in the change at any stage. It also meant they knew little if anything about the change. This meant that the users were not committed to the process change and ultimately did not use the new process.

A key factor in initial project success was the effective teamworking demonstrated by the

project team. The project team worked very well together and were extremely motivated. Initially this led to the project progressing quickly. However, the facilitator felt that not everybody who would be affected by the changes was involved in the project. The facilitator noted that *“some people were not involved in the (process) design. Because they were not involved in design they decided not to use the process”*.

Although the team were given the opportunity to redesign their process the facilitator felt that they just kept slipping back to the processes already in use. The *“hardware and software processes were quite well documented; therefore it was difficult for them to shift their thinking”*. This meant that the project became more of a process analysis and process automation exercise rather than a process redesign or re-engineering project.

The inability to provide education on the LOVEM modelling tool for the steering committee possibly meant that the potential of the project was held back. In addition, some members of the team also found it difficult to devote enough time to the project as project work was in addition to their usual work load.

The process diagrams that were created were not described in detail, as the flows between activities were not understood. The facilitator said the team *“didn't think about interfaces outside Services Development”*. As a result the other departments the project received inputs from or gave outputs to were not involved in the project. These departments did not know about the project and were not committed to it.

The technology could not be introduced to drive the new process. This meant that the professionals who used the process continued to work the way they always had. The new standard process that was documented and input on to the Local Area Network (LAN) was not followed. The facilitator agreed that *“because the technology requirements could not*

be provided, people chose to work in the old way, the way they were comfortable and happy with". "The process diagrams were put on the LAN, but they were never accessed because people didn't know how to and they didn't know the diagrams were there, due to lack of publicity". As a consequence of the lack of use the models were eventually removed from the LAN.

7.4 Conclusions

Phases one and two of the project plan were completed. The strong sponsorship and good team work of the project team helped this implementation. The process models were made available on the department LAN. These process models could have been used to manage and route the flow of work, but generally people still worked in their own individual ways.

As a consequence of the lack of formal project management the project was not co-ordinated with other relevant projects, or with PSS business direction and strategy and the initial problem was inadequately investigated. In addition to this project sponsorship had been lost. These factors meant the process was not completely or successfully implemented.

There was no more project work after the change of management in January 1997. At the beginning of 1997 the project was superseded by other management initiatives that were related to the management restructuring.

As a result of not successfully implementing the project the cost of the project was not recovered. The cost wasted as a consequence of not completely implementing this project is difficult to measure as no finance was provided directly for the project. The wasted cost was in the project team and facilitator's time. The project ran from April 1996 to January 1997. On average one three hour team meeting was held a month. Typically, 6 team members and 2 facilitators would attend the meeting. It could be said that 240 hours was wasted. As the team was geographically dispersed travel and accommodation costs would also have been incurred. In addition, each team member would have spent 10 to 20% of their time over the 10 months working on the project.

Chapter 8

Analysis of Action Research Projects and Other Findings

The main purpose of this research is to attempt to improve the implementation of process-based change projects by developing a framework to guide the management of their implementation. The most significant findings and results from the projects, plus evidence from relevant literature have been used as input to the development of the implementation framework.

A comparison of the process-based change projects and an overview of the results of the action research projects opens this chapter. The grounded theory based process of analysis that was followed to deduce the themes of the framework from the results of the projects is then presented. The empirical and theoretical data that support each theme are then described.

8.1 Action Research Projects

Three process-based change projects have been investigated. Each of these projects has been an IBM process-based change implementation. As the researcher was based in one company over a three year period the research concentrated on depth rather than breadth of analysis. To gain a broad perspective on the issues of implementation and to minimise the limitation of in-depth research in one organisation (such as not being able to research the problem in different company or industry contexts) a diverse range of process-based change projects were researched.

Table 4 illustrates that each of the projects has many different characteristics. Project One in the customer call centres was of medium complexity compared to the two other action

research projects. The change in processes would have significantly impacted the way work was done. Additional technical systems would have been required to support the change in process. Had the process changes been implemented they had the potential to affect some of the call centre's 20 employee's procedures, all hardware customer engineers (approximately 200), the Hardware Support Centre (HSC) employees (approximately 30) and the software and communications people.

Project Two the teamworking project was comparative a very complex project. A cross departmental project team carried out the project. Twenty six employees were trained to be Team Advisors (TAs) and provided with supporting tools such as training manuals. A database to record all TA activities was also developed. The project aimed to change the way all employees in PSS (approximately 1200) worked from individual to team based work. This meant that the project had the potential to affect multiple areas of PSS and all levels of employees from professionals to the director.

The third project in service development was of low complexity. A project team completed the project, however this was not a cross departmental team. Information systems development would have been required had the process changes been implemented, however this was only required to automate the development process already in place. The process change would only have affected the service development employees (approximately 20). No other departments were affected by the changes. In addition the change in process would have standardised the way work was done, but not have vastly influenced the way work was done.

Project Characteristic	Project 1 CSS	Project 2 Team working	Project 3 Service Development
Organisational Complexity	Medium	High	Low
Organisation (PSS) wide		✓	
Departmental/functional Change	✓		✓
Much change required in the user organisation	✓	✓	
Organisational structure change	✓		
Technology Investment	✓		✓
Technology Support to Complete Project e.g. process mapping tools	✓		✓
High Resource Required		✓	
External Consultant Involvement	✓		
Project Team formed		✓	✓
Project Management Tools and techniques used		✓	
Financial Investment Required		✓	
Education and Training Required		✓	
Senior Management Commitment		✓	
Number of employees involved	5	27	9
Employees affected	250	1200	20
Other external input e.g. Benchmarking		✓	
Operational - Strategic project	Strategic	Strategic	Operational
Timescales of project	12 months	19 months	10 months

Table 4: Project Characteristics Table

8.2 Summary of Analysis of Action Research Projects

An abandoned project may be one that 'management decides, for whatever reasons, to discontinue temporarily or retire permanently' (Ewusi-Mensah and Przasnyski, 1994). Each project was implemented to a different extent, but all were eventually abandoned. None of the projects was successfully implemented. Successful implementation in the context of this research refers to; complete implementation, from conception of the process change to full installation, user acceptance and use of the new process. In particular the focus is on user acceptance and use of the new process. The production of business benefits that had been predicted for the implementation and achieving the project objectives is also important.

8.2.1 Process Focus

Many different factors assisted and inhibited the implement of these projects. In each project there was much process analysis, but little design and no completely successful implementation. Employees did not change the way they worked, they continued to use the old processes and procedures. The new processes were not adopted or accepted completely in any of the projects. In addition, each of the projects claimed that process re-engineering was taking place. However, it became evident that the projects were either process mapping or process analysis.

Often a functional view of processes was taken. That is, only that part of the process that took place within the boundary of a department was considered. The interfaces with other departments or where the initial inputs to their processes originated or where the eventual outputs went to were not considered. The complete end to end process was not investigated.

8.2.2 Senior Management Commitment

Typically projects suffered from inconsistent senior management commitment and sponsorship. Active commitment to the projects was rarely demonstrated. In some cases the person acting as sponsor changed or their level of commitment to the project varied. Generally at the beginning of the project the sponsor would attend team meetings and complete his assigned actions. This level of involvement decreased as each project progressed.

8.2.3 Project Planning and Management

Two of the projects lacked a formal project planning and management structure. Either a project manager was not assigned to run the project, or no project objectives or plan were in place. The lack of project management meant that the projects were not co-ordinated with other relevant projects, or with the PSS business direction and strategy. Lack of formal project management also meant that often a business case was not developed. It was noted that not having a formal business case meant that when organisational changes were introduced there were no agreed business reasons for the existence of the project. This meant it was easy for the project to be suspended. The project's goals, objective and boundaries were not formerly agreed; that may have led to the projects suffering from missed deadlines, carried forward actions and slipping time-scales.

Usually projects would evolve from a manager's perception that a process needed improving. These assumptions were accepted as accurate and generally little problem investigation was carried out. The PSS division has its foundations in the engineering environment, this has led to 'Mr fix it' 'solution driven' behaviour developing. This type of behaviour means that when a problem occurs the norm is to search for a solution immediately. In each project little time was spent on defining what the fundamental problem was.

8.2.4 Analysis of the Problem Situation

In every case there was little or no assessment of whether the initiated project would be affected by, or would affect other changes in PSS. A 'broad view' of a problem tended not to be taken. In particular, where a project fitted into current and future IBM and PSS strategy, it was not assessed. Each of the projects was eventually superseded by high level IBM strategic projects.

Two of the projects were initiated from managers' ideas rather than the stated needs of the corporation. Relatively little assessment of alternative approaches to solving the problem was considered. This type of behaviour has been described as 'in the bath thinking', where ideas occur, but 'time is not spent thinking up alternatives'.

8.2.5 Teamworking

Each of the projects has benefited from elements of teamworking. Two of the projects had project teams. These teams were very productive and worked together well. In each of the projects the process changes were complex, involving several areas of the business, processes, people and technology. Teamworking was perceived as a very useful method of working in this type of situation. Working in teams also meant that different perspectives, problems and alternative options were considered.

8.2.6 Organisational Change

It has been said that a common occurrence in IBM is to have 'too much change. IBM do not give changes a chance to produce the benefits they were intended to generate, before the next change is being introduced'. Each of the projects suffered repercussions from the restructuring of the organisation. The constant environment of change meant that when a new project was introduced, it was viewed with scepticism, or as the latest 'fad'. There appeared to be a perception that if the new concept were ignored, it would eventually disappear and work could be done in the way it always had been. This perception made it

very difficult to generate commitment to the project.

8.2.7 User Involvement

User involvement was encouraged in each of the projects. For example, all of the projects had representatives from each group of users who were affected by changes. However, in each project it was noted that user involvement in the changes could have been encouraged to a greater extent. If more users were involved it was felt by the sponsors that there would have been more commitment to the changes that were taking place.

8.2.8 Communication

In all of the projects the internal communication between those directly involved in the projects was usually very thorough. External communication to those who were affected by the project but not directly involved on the project team was not always consistent or regular. Where communication was not sufficient employees did not know about the project work, so were not always committed to the project and could be resistant to the changes.

The projects were eventually discontinued as they were superseded by other projects that were perceived to be more in line with the new management strategy for PSS. The lack of formal project planning and management, inadequate investigation of the initial problem and inconsistent sponsorship were cited as reasons why the projects were discontinued.

8.3 Triangulation

From the project findings and the literature review several factors crucial for successful implementation were beginning to emerge. In order to develop and elaborate on these emerging themes two additional methods of data collection were employed. 'The use of more than one source or method of data collection' (Denzin 1989) is known as triangulation. Eden and Huxham (1996), as one of their contentions for action research recommend that opportunities for triangulation are taken advantage of whenever possible.

Triangulation is very valuable as it often results 'in a fuller and more revealing portrait of the situation and people involved' (Cassell & Symon 1994). Advantages of using more than one method of research are that various information on the same issue can be gathered and the inadequacies of one method can be counter balanced by another (Sarantakos 1993). Similarly using multiple methods is useful as it helps to avoid the biases that may occur from using single methods or a single investigator. Triangulation is also important as it can lead to an increase in the possibilities for knowledge production (Flick, 1998).

Denzin (1989) categorises triangulation in four types of: data, investigator, theory and method:

- Data triangulation involves using the same method of research to investigate as many sources of data as possible. Different sources of data may be gleaned over time, space or by person (this includes, individuals, small groups and families or collectivities such as organisations or communities).
- Investigator triangulation is where more than one researcher is used. This is a useful approach as it reduces the biases that one researcher may have.
- Triangulation by theory requires that the same body of data is tested using several

theoretical frameworks.

- The final method of triangulation, methodological may be used as 'within-method' and 'between or across-method'. Within-method triangulation uses several strategies within one method of research to analyse data. An example could be a questionnaire that uses different scales and types of measures. Between or across-method triangulation is where more than one research method is used to interrogate the same empirical evidence.

Triangulation by method and data was used in this research. Triangulation does have disadvantages; such as, it is very unlikely that different methods used to study the same phenomenon would ever produce exactly the same results. However, where a thorough method of triangulation is taken the potential to 'broaden, thicken and deepen the interpretative base of any study' (Denzin 1989) is heightened. The transcripts written from the results of these research methods can be found in Appendix 4. The results of analysing the transcripts are described in the second half of this chapter.

8.3.1 Focus Groups

As explained in chapter 4 a focus group is 'a form of group interview in which the data arise from dialogue and general discussion among participants, rather than from a dialogue between yourself as investigator and a single person as respondent' (Kraut 1996). The purpose of running the focus groups was so that a 'range of views and attitudes' (Jankowicz, 1991) about the factors that affect implementation could be collected.

Jankowicz (1991) suggests that a pair of focus groups is adequate if the purpose of the group is to familiarise yourself with the range of views held about the subject being investigated. To broaden and increase understanding of process change projects in PSS and the factors affecting their implementation two focus groups were held.

The groups took place over half a day and four or five key professionals closely involved in process changes in PSS attended each group. As recommended by Flick (1998) and Jankowicz (1991) the process improvement professionals were all of a similar job level. This avoided the possibility of more senior management inhibited or limiting the responses of the participants.

Each participant was asked to think of two process change projects they had been heavily involved in, one successful and one unsuccessful. The researcher guided the session by focusing on the attributes of the successful and unsuccessful projects. The questions that were asked about the successful and unsuccessful projects were:

- What worked about these projects?
- What didn't work in these projects?
- What should have been done differently in these projects?

The focus groups were concluded with the researcher asking if the group felt that all the important aspects that affect process change projects had been discussed.

8.3.2 Semi-structured Interviews

One of the disadvantages of focus groups is that the views, opinions and ideas offered by the attendees are only those that are 'publicly expressible' (Jankowicz, 1991). Thus, in addition, as recommended by Jankowicz (1991) semi-structured interviews were also carried out to elicit any additional information and to investigate in greater depth the factors that affect implementation.

Semi-structured interviews were held with the sponsors of the three research projects and three employees heavily involved in the process improvements activities in PSS. The interview process that was followed was similar to that of Isabella (1990). Each interview lasted one and a half to two hours. The interview began by gathering information about the interviewee's career background and current role. The sponsors were asked what they felt worked and did not work about the project. The researcher's findings from the research projects were then discussed and developed. The process change professionals were asked the same set of questions about their experiences of process changes they had been involved in. Their opinions of what worked, didn't work and what should have been done differently in PSS process change projects were collected.

Interviewees were asked for specific examples to illustrate their thoughts and ideas and to increase the researcher's understanding. Questions used included "what was the consequence of this.....?" "How did this affect.....?" These questions were used to 'elicit rich details and graphic descriptions or to learn why observations were important to interviewees' (Isabella 1990). At the end of the interviews the interviewees were asked if there was anything else of significance that affected process change that had not been covered already.

Valuable insights into possible reasons for process changes taking place in the way they did and having the results they did were gathered. The research was greatly enhanced and validated from these interviews and focus groups.

All interviews and focus groups were conducted on the understanding that they would not be tape recorded. The interview transcripts were written from notes taken during the interview and the focus group transcripts were written from information recorded on flip charts during the meeting. All transcripts were written immediately after the sessions so that additional information could also be recalled from the researchers memory.

8.4 Grounded Theory

Grounded theory was the method used to develop theory. Grounded theory (as described in Chapter 4) requires 'that data and theory be constantly compared and contrasted throughout the data collection and analysis process.' (Isabella 1990). Grounded theory was used to analyse the action research projects, focus groups and semi-structured interview data.

Glaser and Strauss put forward a four stage approach that could be used to constantly compare data. The first stage involves assigning a code to each incidence of the collected data. Every unit of data should be classified (or coded) according to the subject area it is concerned with. The more popular codes become overarching categories. The second stage aims to develop the properties of each category by comparing new data incidences with previous coded data incidences. As the process of analysis progresses new incidences are compared with properties of the categories, rather than other incidences. The next stage is concerned with delimiting the theory by decreasing the number of categories. Useful categories are expanded and less useful ones are discarded. The constant comparison of incidences eventually reaches a saturation point where no more categories

emerge. The final stage focuses on writing of the theory. The categories form the foundation of the theory. The written up ideas that relate to each category are known as 'memos'.

Since the seminal work on grounded theory by Glaser and Strauss in 1967, Strauss and Corbin (1990) have developed a more prescriptive step by step approach for generating theory. Although this approach offers a structured formal set of procedures that can be followed by a researcher to develop grounded theory, it is the more flexible Glaser and Strauss approach that has been followed for this research. The exact method of coding, categorisation and theory building that was used is described below.

8.4.1 Experiential Data

There are conflicting views about whether the researcher should allow their past experiences to influence the development of their grounded theory. Strauss (1987), Strauss and Corbin (1990) and Silverman (1993) believe that past knowledge and experiences should be incorporated into theory generation. Past experience of literature, hypotheses, ways of thinking about data and ways of comparing data are all valuable experiential data. Strauss (1987) suggests that the biases of using past experiences can be controlled in the data collection, coding and memoing stages.

The process of analysis (triangulation, initial coding and focused coding) described below has taken advantage of the researcher's previous experiences. Indeed, prior experience has been used throughout the analysis process by following a process similar to Kolb's model of experiential learning.

Kolb's model (figure 10) suggests that learning may be perceived as a four stage cycle. Immediate concrete experiences guide initial observations and reflections. Reflections are

used to build a theory or idea. These new ideas guide the direction and focus of testing.

From the testing new experiences evolve and the cycle begins again.

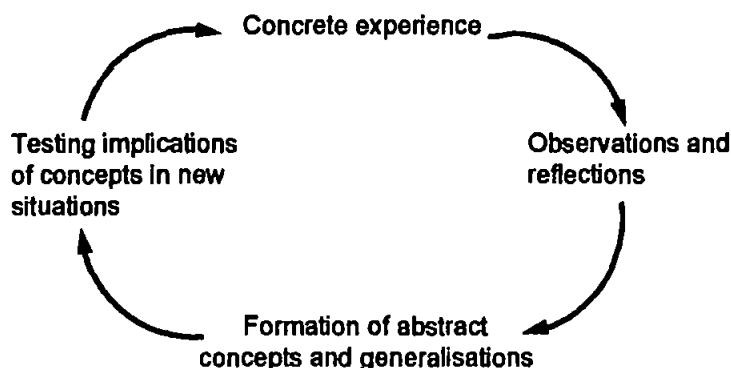


Figure 10: Kolb's (1979) Model of Experiential Learning

The process of analysis was based on the past experiences formed from working on the action research projects and researching and writing the implementation literature review (Chapters 2 & 3). The initial observations and reflections about what was affecting implementation were formed from this work. Coding of the data was guided by these initial ideas and experiences. From this first phase of data coding the initial concept of the implementation framework was established. This concept focused the direction of the next phase of action research. Focus groups and semi-structured interviews were held to formalise, substantiate and test these early concepts. The new experiences gained from this testing were then used to guide the next phase of coding, theory (concept) building and testing.

The cycle of coding data, reformalising the framework and testing the framework through additional action research went through several iterations. The analysis concluded once the theory stabilised and the coding could not be substantially enhanced by another cycle of analysis.

8.5 Data Analysis

Several authors (Miles & Huberman 1994, Lofland & Lofland 1995, Robson 1993, Sarantakos 1993) provided advice on structured approaches that can be used to analyse qualitative data. For example Miles & Huberman put forward a process of analysis that includes, creating session summary sheets, creating document summary sheets, developing coding categories, memoing these codes and producing interim summaries of findings.

Lofland and Lofland (1995) present a series of strategies that may be selected, adapted or combined as a process of analysis. The third of their recommendations is coding. This is the method of analysis that was used for this research.

8.5.1 Process of Coding

Coding is a method used to sort, organise and categorise research data and most importantly to give labels to ideas (Lofland and Lofland 1995). The purpose of this coding was to bring together similar data and to allow the dominant themes that affect implementation to emerge. The ideas and hunches about what affected implementation that emerged from the literature review acted as an underlying analytical framework to guide the initial coding. The research questions also helped to guide the coding.

Lofland and Lofland (1995) have labelled the main coding task as 'analytic' coding.

Although each qualitative researcher will have their own method of coding, Lofland and Lofland suggest that a basic distinction between initial and focused coding may be made. Initial coding involves the researcher using expertise and knowledge to code all the data and to develop initial categories. Focused coding involves the narrowing down of useful categories and removal of unhelpful categories. Some of the more useful categories may develop into overarching categories that consist of more detailed sub-categories. This process of initial then focused analytic coding was followed.

8.5.1.1 Initial coding

The first phase of coding involved reading through every piece of relevant information generated in the research. Each paper-based transcript was read through and every unit of data assigned a code. Typically the unit of data coded was a paragraph and occasionally a sentence or phrase. The code name that each unit of data had been associated with was marked in the margin of the transcript.

The action research project findings and outcomes were coded first. The focus groups and interview transcript were written up, soon after they had been completed. This data was coded using the constant comparison method (each new incidence of data was compared with already coded incidences).

As the initial coding developed, general codes of similar subjects were grouped together. These groups became over-arching categories. The initial ideas behind the codes and categories that developed were simply written up on a word processor. The category or code being explained was highlighted in bold and italics, as illustrated in table 5 below:

SMC	<i>"Top management commitment</i> to the project being implemented is essential. Consistent active sponsorship, throughout the life of the project has been seen to be essential to keep motivation and morale to those involved in projects high. Commitment of the highest level of management and the management committee is more credible and preferable so that the change is completely and successfully implemented."
APS	<i>"One of the key problems to deal with is how to ensure that the project is in line with current organisations strategies</i> and other changes taking place. A consideration with this problem area may be to assess whether the project is essential to the organisation."

KEY: SMC = Senior Management Commitment, APS = Analysis of Problem Situation

Table 5: Development of Categories

8.5.1.2 Focused Coding

Two months after the initial coding began the researcher gained access to a database program. The project findings, interviews and focus group transcripts were put into the computer database and coding was finalised using the database.

The second phase of coding involved developing the detail of the categories. New coded data from the most recent interviews and focus groups was compared with the categories rather than other individual coded incidences. From this comparison sub categories developed; for example 'sponsorship' and 'change agent' became sub categories of senior management commitment.

The next stage of the coding was to decide which categories were and were not helpful. The focus was then on expanding or adapting useful categories, whilst abandoning less useful ones. Typically, categories where little data had been produced and/or the emerging category was unclear were abandoned; for example organisational culture.

After a number of iterations of the coding processes no new categories or codes emerged. Glaser and Strauss (1967) refer to this as data analysis saturation. When the current codes and categories "encompass all the nuances of any new data that are analysed" (Isabella 1990) data analysis saturation has been reached.

One method of verifying the data analysis is to request feedback from the original respondents. As the coding progressed and categories began to emerge, several interviewees were asked to review the outcomes. In addition the second focus group reviewed the categories. The categories were all confirmed as being important for successful implementation. Several categories were expanded as a consequence of the

feedback. Table 6 illustrates the development of the themes as the coding progressed.

8.5.2 Coding

The first half of the literature review (Chapter 2) investigated factors that have been reported as affecting implementation. This investigation revealed several categories that appeared to be more widely reported as affecting implementation. These factors included; top management commitment, user involvement, project management, user attitudes, decision style, resistance to change, organisational culture and managing change. From the empirical research several similar categories to those that evolved from the literature review appeared to receive a great deal of emphasis, in particular, top management commitment. Other themes that developed from the literature review received more or less emphasis from the empirical evidence. For example user involvement and resistance to change were not as highly stressed in the empirical evidence, whereas project management received much more attention. New themes also evolved from the empirical research that had not become evident from the literature review, such as analysis of the problem situation. Table 6 below illustrates the development of the categories throughout the coding process.

INITIAL CATEGORY	EXAMPLE	FINAL CATEGORY & SUB CATEGORIES
Pre Planning & Scoping	Investigating the problem at the beginning of the project	Analysis of the Problem Situation <ul style="list-style-type: none"> • Time to analyse problem • Fundamental problem • Context of problem • Method of problem solving
Project Management Planning	Tracking completion of actions and objectives Planning project progress throughout the whole project	Project Planning and Management <ul style="list-style-type: none"> • Manage and monitor project progress • Project definition • Planning complete project • Business case
User Participation Teamworking	Involving users in process design and implementation Two projects benefited from project teams	User Involvement <ul style="list-style-type: none"> • Teamworking • Communications
Top Management Commitment	Ensuring the appropriate senior managers are actively and consistently committed to the project	Senior Management Commitment <ul style="list-style-type: none"> • Sponsorship • Change Agent
Process-based change	Ensuring that whole processes (end to end, across functional boundaries) are being redesigned	Process Focus
Organisational Culture	Ensuring the organisational culture and the department sub culture are considered	No category developed

Table 6: Development of Coding

NOTE: Coding of the data was completed solely by the researcher. The codes assigned to each unit of data have not been verified in detail by another researcher. However, the themes and sub-themes that evolved have been thoroughly tested and validated using a process of feedback as explained above.

8.6 Emerging Themes

From the process of analysis five dominant themes emerged. of, senior management commitment, analysis of the problem situation, user involvement, project planning and management and process focus. The dominant themes were those that consistently reoccurred. These themes formed the foundation of the framework to help improve the management of process-based change implementation.

Lofland and Lofland's fourth strategy recommends that a 'memo' for each code is written. A memo is the 'explanations and elaboration of the coding categories'. Memos may vary in length from a sentence to a couple of pages. The following section of this chapter will present the memos for each theme of the implementation framework. The literature and theories that each theme is grounded in and supported by will also be explained.

8.6.1 Senior Management Commitment

As noted in the implementation literature review top management commitment and involvement in change is a very important factor in encouraging successful implementation. The empirical evidence strongly supported this idea. The senior management commitment theme of this research developed into three sub divisions of; senior management commitment, project sponsorship and use of a change agent.

Relevant high level senior management should be committed to the project and be willing to demonstrate their commitment by active involvement. Where a project 'loses the support of key management' (as has happened in the three action research projects) 'there is a high likelihood that, *ceteris paribus*, the project may eventually be abandoned' (Ewusi-Mensah and Przasnyski, 1994). The literature review illustrated that a high level of commitment and involvement is a necessity so that the other managers and professionals pick up 'cues' (Meredith 1981) of how to behave. Management commitment is also

important to ensure that resources and funding are provided and human resource allocated the time to work on the project (Ewusi-Mensah and Przasnyski, 1994). It was suggested in a focus group, that one way that this involvement and support could be demonstrated was via providing sponsorship to the project.

The importance of providing a sponsor to a project was a factor that evolved primarily from the empirical work. Each of the action research projects had a senior manager assigned as sponsor. It was noted in a focus group that obtaining *"the correct level of sponsorship"* was important so that the project has *"as much credibility as it should"*. Similarly, in support of sponsorship one interviewee noted that *"if a project has high level sponsorship, commitment and involvement then implementation would be considerably shorter"*. It was said that where possible sponsorship should come from *"director level"*.

All interviewees described sponsorship of a project as important. One interviewee noted that *"sponsorship was essential to bring inspirational and motivational leadership"*. Other roles it was noted sponsorship of a project should include were, providing ownership and leadership of the project. One interviewee felt that *"someone has to be committed, have a vision and a desire to see the project through, otherwise the project will not happen"*. *"Where the sponsor didn't have the drive or commitment to the project.....we were not as successful as we could have been"*. Each of the projects was affected by management changes. Ewusi-Mensah and Przasnyski (1994) recommend that another important role for the sponsor is to 'seek a diverse and wide support among the senior management of the organisation as insurance against any management turnover and its potentially harmful consequence on the project's success.

In addition it was noted that the sponsor should be *"appropriate and should not just be a nominal sponsor"* and should even have *"some emotional involvement in the project"*.

This means that the sponsor should not just say they are committed to the project, but they should show they are committed by being actively involved and making 'public their support' (Terez 1990). As Lucas et al (1990) explains 'obtaining tacit support is not enough; the manager must indicate through both words and actions that he or she supports the system'. Typically, this could mean the sponsor is a member of the project team, uses the system and represents the project at management board meetings.

There is an additional element to this theme that has not been found in the literature. This is that the commitment and involvement of the sponsor and senior manager should be consistent throughout the complete process of implementation. It was noted in one focus group that *"sponsors need to be continually focused. Either management churn means that the manager changes and commitment dwindles or the commitment dwindles over time"*. Each of the research projects was affected by lack of consistent sponsorship problems. Two of the projects began with strong active management sponsorship that was subsequently lost when the manager changed. The other project suffered with varying commitment of the sponsor, as well as changing sponsors.

A final element of the senior management commitment theme that has become evident is the importance of a change agent for implementation success (Curley & Gremillion 1983). This factor developed from both empirical and theoretical evidence. A change agent is a manager or professional who takes 'control of planned change processes' (Nutt 1986).

An interviewee noted that an *"evangelist or believer is required to drive the project and to drive the sponsor to tell him what to say and what will happen."* Curley & Gremillion (1983) have suggested that a 'systems champion' may take the role of 'top management surrogate'. Where the senior management do not personally have the time to express their support, it is recommended that the systems champion could *"reinforce management*

support". In the teamworking action research project the project manager became the change agent. The sponsor did not have time to dedicate to the project, so the change agent led the project. The change agent was totally dedicated to the project and worked tirelessly to encourage and infuse commitment from managers and professionals involved and affected by the change. The change agent also became a 'moral agent' who dealt with the personal and ethical issues that occurred as a consequence of changing the way people worked from an individual based environment to a teamworking environment.

8.6.2 Analysis of Problem Situation

This theme is not one that became immediately evident from the literature review. It is a theme that developed primarily from the action research projects with additional support from the focus groups and interviews. The facets of this theme include, taking time to understand the fundamental problem, understanding the problem within the context of other current and planned changes and considering alternative methods of problem solving.

Meredith (1981) states that a major reason for lack of implementation success is that the underlying problem or opportunity being investigated is not of major importance.

Meredith advises that the project is of 'significant current importance to top management's objective for the business. Otherwise it will not receive the support and resources it requires from top management, nor will it get the attention and time it requires from the users to achieve full, successful implementation' (Meredith 1981). Two of the action research projects were initiated from managers' perceptions of problems rather than being driven by corporate directed strategy. The first aspect of this theme is that for successful implementation the problem being address should be a real, critical, 'fundamentally sound' (Alexander 1985) problem, not as Nutt (1986) warns 'a manager's incorrect stipulation about a needs or opportunity'.

In addition to ensuring that the problem is real and critical, time must be spent on understanding the problem. In each of the action research projects little time was spent on examining the nature of the fundamental problem. A common description of PSS was as being *“full of solutioning”*. As mentioned at the beginning of the chapter the PSS division has its foundations in the customer engineering environment, which has led to behaviour described as *“Mr Fix-it”* or *“solution driven”*. As one interviewee said *“not much time is spent in the diagnostic phase”*. This means that as soon as a problem occurs the natural reaction is to find a solution immediately. The respondent noted that *“we should spend time thinking through the problem, but being the culture that we are we start out straight away. PSS culture is one of get on with it. Much analysis and diagnostics and thinking about the problem is not viewed as valuable”*. Another interviewee described this as issue management; *“issue management is much like fire-fighting where you are constantly dealing with the problem to hand and not doing much thinking ahead and long term strategic thinking. IBMers like issue management as they get a feel-good factor from fixing problems immediately. There is very little thinking about why you have that problem. IBM should do more exceptions management and go back to think about the fundamentals. Exception management may take several days to sort out and then another few days to persuade others to commit to the ideas. IBM do not realise that exception management will actually save time in the long run.”*

The focus of this factor is to highlight the need for more time to be spent examining the problem and ensuring the fundamental problem is being investigated. Indeed, Beer et al (1990) recommend that ‘the starting point of any effective change effort is a clearly defined business problem’. An interviewee stated that *“there is much fixing of symptoms and not causes”* there is a *“draw, fire, aim - shit, wrong target”* tendency where the problem situation is not considered and then the project goes *“off on the wrong track”*. Two of the action research projects were initiated from managers’ perceptions of a

problem in their departments. In addition an interviewee warned that *“major projects”* have been *“begun on major assumptions”*. This type of behaviour has been described as *“in the bath thinking”* or *“eureka thinking”* where ideas occur, but time is not spent on thinking the situation through or considering what the fundamental problem is. Nutt (1986) warns of the dangers of taking pragmatic measures that paper over issues and do not address the fundamental problem. Nutt recommends that the origin of the problem must be investigated otherwise, it is likely that the original grievances might reappear.

A further aspect of this theme is that the problem needs to be understood and considered within the context of other changes that are occurring within the organisation. The CSS and services development projects were initiated without an assessment of whether the initiated project would be affected by, or would affect, other changes in PSS. An interviewee when commenting on the services development project said *“the sponsor should have considered how his idea for a project would fit into the overall strategy of PSS for technical, financial, and process changes”*. In support of this view another interviewee said that *“how the planned process change will be affected by these changes should be considered as well as the consequence of the process change on the other changes and changes already taking place need to be taken into account as do planned future changes”*. The process change should be co-ordinated with other changes in; processes, IT and IS, organisation structure changes and the overall business strategy.

It was noted on several occasions that a wider view of a problem should be taken; for example an interviewee said that *“the culture is very creative but at the same time quite blinkered in its approach to change”*; for example *“there is little looking at the wider view of a change. Perhaps a more ‘holistic’ approach to looking at the problem should be taken”*. Ensuring that all the people, processes and technology that are involved in the problem situation are considered, is another aspect of this theme.

A final element of this theme is the recommendation that alternative methods for solving the problem are considered thoroughly at the beginning of a project. As noted by one interviewee, very often the solution to the problem is known before the project begins, which means, "*They start doing before they start planning*". In the CSS and service delivery projects the method chosen to solve the problem was not questioned. The approaches of LOVEM and IDEF0 were recommended by the facilitators and process consultants and the sponsor agreed to these approaches without consultation with the project team or considering alternative approaches. The LOVEM approach was a complicated tool, for which no training could be provided. It is possible that if time had been taken to consider alternative problem solving techniques, a different approach may have been used.

8.6.3 User Involvement

User involvement in the process of change is a theme that originated from the implementation literature review. The empirical evidence supported and focused the direction of this theme. Several sub-categories were developed within this theme; involvement of users directly and indirectly affected by the change, communications within the project team and external to the rest of the organisation, teamworking and project team training into the new process.

Alexander (1985) recommends that involvement and commitment from those affected by the change should be encouraged throughout the implementation process. Ewusi-Mensah and Przasnyski (1994) suggest that where there is little user involvement or it is taken for granted the 'potential for conflicts, disagreements and perhaps even outright resistance may arise in the course of the project's development and this may eventually contribute to abandonment'. Typically, where management and professionals affected by a change are permitted to be involved with planning the implementation, their commitment will increase (Alexander 1985). Terez (1990) and Levy (1991) in support says one of the most effective ways to build commitment is to involve employees in the change. Lucas et al (1990) suggest that user involvement is important, as 'user involvement in system selection, design, and implementation should lead to more favourable attitudes towards the system; awareness and knowledge of the system developed through involvement with it should result in more favourable assessments of it, which will in turn lead to acceptance and use'. Involvement should also help to build a 'sense of ownership' of the new system (Terez 1990, Levy 1991). From the action research projects it became evident that for user involvement to help lead to successful implementation then users would have to be involved in the complete process of change. The user involvement theme is predominantly concerned with ensuring employees directly and indirectly affected by change are involved

in the project.

One approach to encouraging involvement and commitment is to form teams or 'task-forces' of key stakeholders affected by the change (Nutt 1986). The teamworking and service development action research projects were run by project teams. Teamworking was used as a method for involving those who are directly involved in the process change in the teamworking and services development projects. The CSS project was not run by a project team and the sponsor of this project noted that *"what didn't work on the project was not having the right people in CSS committed to change. In hindsight I should have formed a team who could have worked on the process changes full time"*. The project manager of the teamworking project also felt that he *"should have got a project team set up straight away. This didn't happen immediately as the project manager's role was not clearly defined. Once the project team was formed, things started to happen"*.

Meredith (1981) recommends that team members should have a 'full representation from every affected department and area.' The members of the project team were made up of representatives from each group of users affected by the proposed changes. The facilitator of the services development project said that *"forming a cross functional project team helped to get 'buy-in' from different parts of the organisation. This type of team meant the project had a far better chance of succeeding."*

These teams were very productive and worked together well. In each of the projects the process changes were complex, involving several departments, different processes and different information systems. Different perspectives and alternative options to situations were always considered before consensus decisions were made. Even though different areas of the business were represented in the project teams, it was noted that user involvement in the changes could be encouraged to a greater extent. If more users were

involved it was felt that there would be more commitment to the changes that were taking place. The importance of involvement is highlighted by the facilitator of the services development project, who said that there was a *“need to get all relevant people involved. Some people were not involved in process design; because they were not involved in design they decided not to use it”*.

In all of the projects the internal communication between those directly involved in the projects was usually very effective. However, external communication to those who were affected by the project but not directly involved in the project team was not consistent or regular. An interviewee said that *“communications about process changes are perceived as insufficient, in some cases inconsistent and confusing”, “in many cases employees do not understand what process change is or the reasons why it is being introduced”*.

Insufficient communication to the users led to lack of commitment to the change and some resistance to the changes. For example in the services development project, *“those not involved with the project were not so bought-in as there were no communications to look at”*. As noted during a focus group *“if people are not involved directly in the change but are affected by it, they should be communicated to about what's going on”*. There were several problems with communication processes in PSS, one interviewee noted that *“communications in IBM are e-mail based and once managers have sent a note they think they have communicated. In reality all that has happened is a note has been sent which may or may not have been read. IBMers also think that by putting an article in an IBM publication that everybody will understand and be ‘bought into’ the subject”*. Levy (1991) said that communication is ‘probably the single most effective key to successful implementation but requires a major effort if it is to succeed’. Levy (1991) suggested that communications should be active, open, timely and use different media. Alexander’s work on implementing strategy found that top management should communicate what the

change is about with all employees. It was found that 'two-way' communication is preferable where employees are permitted to ask questions about the change and topics such as, new roles and responsibilities or tasks and duties. Levy et al (1991) also add that unless there is 'two-way communication that employees can 'express their responses and ideas and voice their concerns then no amount of top down communication will succeed in generating commitment'. In addition, Alexander points out that 'two-way' communication is also useful throughout the change to monitor implementation progress and any problems that arise.

A final aspect of this theme is that training and education about the process change should be provided. This is an aspect that came through strongly from both the literature and the empirical evidence. It is recognised that aspects such as education and training are required for implementation success, for example Kinnie and Staughton (1991) state that 'ensuring that the skills knowledge and attitudes the company need now and the different ones they may need in the future are recognised and developed'.

8.6.4 Process Focus

The literature review did indicate some weaknesses with process change, such as Grover's (1995) problems of process delineation. Although, the specific aspects of this theme have mainly evolved from the empirical evidence collected. The aspects of this theme include ensuring a complete end to end process is being implemented, a measurement system is in place and methods to ensure the process will be used have been considered.

The process-based change theme is concerned with ensuring that process change is occurring. In the service delivery action research project the original aim was process re-engineering (radically redesign processes). It became evident that the projects were process mapping or process analysis rather than radical redesign. The services development project facilitator felt that *"the team were given the opportunity to redesign their process but they just kept slipping back to their current situation. This led to process mapping not reengineering. The hardware and software processes were quite well documented it was therefore difficult for them to shift their thinking"*. Similarly, the sponsor of the CSS project felt that *"The work that had been carried out was mainly process improvements, not radical improvements. The core way that the process is dealt with hasn't changed, the technology they use has changed and some procedures. These type of changes will not get IBM radical increases in customer satisfaction and decreases in costs"*.

It was often the case that the whole process was not being investigated. A departmental view of process activities was usually taken, where the process boundary only included the activities which took place within the department. Interfaces with other departments, the sources of initial inputs to the processes or the receivers of the eventual outputs were not usually considered; for example the service development project facilitator noticed that

“the processes that were being examined were limited to the part of the process in services development. The interactions with other functions were not examined; the team didn’t think about interfaces outside services development and they didn’t get other functions bought in”.

Another aspect of the process focus theme is that the complete process change needs to occur for implementation to be successful. In particular, an interviewee noted that *“there is much analysis and design but little implementation”*. In addition a focus group noted that *“people in PSS love to design, but are very poor at the implementation piece”*.

A final aspect of the process focus theme is that the adoption of a process into normal working practices should be encouraged or enforced. The facilitator of the services development project stated that *“because the technology requirements were not signed off and implemented, people chose to work in the old way; the way they were comfortable and happy with”*. There was no system in place to enforce or encourage the use of the new process.

8.6.5 Project Planning and Management

The focus of this theme is to promote the use of project management techniques to plan, monitor and guide project progress. The project planning and management theme developed originally from the literature, but predominantly from the evidence collected from the action research projects. The sub categories of this theme include installing a project management system, planning the project course from beginning to end, thoroughly understanding project scope and completing a business case.

This theme developed from evidence that suggested that where projects did not have a formal, agreed project planning and management system in place, actions and deadlines would be missed and the project would fall behind its planned timescales. Two of the research projects were not run by a project manager and were not formally organised as projects. There were no formal project documents stating the project aim, objectives, scope, risks or dependencies and no project plan had been agreed. The teamworking project had a formal project planning and management system in place. Actions were completed on time and to budget.

An interviewee said that without *“a good project manager a project is fundamentally flawed, for example there is no scoping or planning. It is the bedrock of a project”*.

However, another interviewee noted that there was a problem with project management in PSS. He said that *“PSS play at project management. Project teams are not often dedicated full time to a project they have been selected to work on. They are expected to be on the project team and do their current day job. PSS just does the bits of project management they like”*.

The lack of project management disciplines has several effects on the projects. Two of the

action research projects did not examine the scope of the project in detail. This had several repercussions. There was no one consistent view of where the project was and more importantly, as an interviewee noted *"the size of the project was not understood"*. The Services Development and Central Support Services projects suffered from *"scope creep"* where the project steadily increased in size. The lack of understanding of the Services Development project boundaries at the beginning of the project meant that the need to automate the process was not realised until six months into the project. As a consequence the investment required in technology and need for IS developers' time had not been planned for. By the time these requirements had been analysed and costs estimated spending constraints had been imposed in PSS. The facilitator of the services development project felt that as *"the project was not scoped out enough. All the requirements for the future were not known. As a consequence sign-offs that were required were not understood early and were not authorised"*. Had the scope of the project been completely understood in the beginning, the financing could have been obtained or the project abandoned at the outset, rather than six months of project work be completed perhaps pointlessly. Ewusi-Mensah and Przasnyski (1994) found that 'escalating project cost and lengthening completion schedules' partly caused by inadequately understanding and defining project requirements, is the highest contributing factor in a decision to abandon a project. This facet of the project management theme was to suggest that the aim, objective and scope of the project need to be thoroughly examined and understood.

Project planning is a specific consideration of this theme. This is essential, as Alexander (1985) points out 'no amount of implementation effort can help rescue' a 'poorly conceived and formulated plan'. In addition, Alexander recommends that a plan should not be so vague, that it is impractical, or too detailed that it's constraining. It has been said that *"PSS does not plan properly in the long run"*. Typically the initial focus of a project would be to concentrate on the immediate outcomes of the project; such as in the Services

Development project. The effect of this short run *“quick win”* focus was that projects were not planned through to completion. The start up of a project and the immediate progress is planned thoroughly, but the complete project progress and the milestones to reach throughout are not thought through or planned adequately. Project planning occurs as and when it is required, rather than in advance. This common behaviour was noted in an interview, as to *“plan in flight”*. As noted in a focus group *“PSS is very good at generating the initial enthusiasm and launching projects”*. It was also said in an interview that *“projects are not normally rolled out. All the preliminary work is carried out, but the roll out rarely occurs”*. The focus of this theme is that the complete project should be planned from conception to eventual successful implementation and user acceptance and use of the system.

McGolpin & Ward (1997) suggest that success is more likely if the potential benefits of the implementation are identified at the beginning of the project. An interviewee noted that a *“valid business case to check return of investment (whether you will get back more than you put in) is not always put together”*. Meredith (1981) noted that it is difficult to measure what benefits and cost savings have been generated. However, at the same time he recommends that ‘measurable, demonstrable and substantial’ savings and benefits must be clear. An additional suggestion of this project planning and management theme is that project management should include the development of a business case in support of the project. Only the teamworking project created a business case. Completing a business case is important so that an agreed business reason for the existence of the project is defined and the business benefits of the project are quantified and qualified.

The consequence in the two projects that did not have a formal business case was that they were put on hold whilst organisational restructuring took place. The new management structure was put in place and process change projects were reprioritised. In both of these

cases the projects were eventually superseded by projects which were given a higher priority in the reorganisation. The lack of a business case that had been formally agreed and committed to meant that when organisational changes were introduced there was no agreed business reason for the existence of the project. The facilitator of the services development project said that *“if more time were spent on the long run business case to show long run benefits then we might have got the case through”*.

8.7 Conclusions

This chapter has described the processes followed to analyse the qualifiable data. Five over-arching themes emerged from the analysis. The final half of this chapter presented the empirical foundations that these themes were based on. Where relevant these themes were linked to the supporting literature.

The output at this stage of research is five dominant themes that affect implementation. These themes are supported by various elements of existing theory and empirical evidence. It has not become apparent from the research that one factor is more inhibiting than another. It is more likely that the problem of unsuccessful implementation is a complex one which may only begin to be improved when all the themes are addressed together as a whole throughout implementation.

So far the research has developed some theory and knowledge about the factors that should be addressed throughout implementation if it is to be successful. Eden and Huxham's (1996) first contention notes the importance of action research having implications beyond those required for action or generation of knowledge. To make this research more useful as required by Eden and Huxham's (1996) contention a process to manage implementation and the factors affecting implementation has been developed. The remaining chapters describe this process and the research that was carried out to test the hypothesis that this approach would lead to more successful implementation.

Chapter 9

Process for Using the Implementation Framework

The five themes found to be important when implementing a process change have been described in the previous chapter. Having found that there were five themes that were important in the implementation of process-based change it was necessary to find means to apply the five themes to further projects. In order to test the themes a framework for application was required. The framework for improving the management of implementation is based on these themes and two tools; a Focus Group and a Process-Based Change Implementation Audit Questionnaire. The tools were developed to support the framework.

The first half of this chapter will describe the tools in detail. The questionnaire development and focus group preparation process will be outlined. The questionnaire's internal and external reliability and validity checks will also be explained. The final half of this chapter will summarise the process the researcher has used to apply these tools.

9.1 *The Implementation Framework*

The concept of a framework to improve the implementation of process-based change is based upon the five themes that emerged from the data analysis. As illustrated in figure 11 below, the five themes crucial for successful implementation are, senior management commitment, analysis of the problem situation, user involvement, process focus and project planning and management.



Figure 11: Implementation of Process-based Change Framework

The research to identify the factors that affect implementation is very important. However, as Walsham (1993) describes simply doing research into the factors that affect implementation 'has a rather static feel to it, with no consideration of the dynamics of the process of organisational implementation'. The aim of the next stage of the research is to provide a solution to this dilemma by developing a framework to manage the implementation process, particularly of process-based change projects.

Lucas et al (1990) recommend that 'implementers should consider surveys, focus groups and other techniques to monitor aspects of the implementation process'. As Lucas suggests, to ensure each of the themes are considered throughout implementation two tools have been developed; an Implementation Focus Group and a Process-Based Change Implementation Audit Questionnaire.

9.1.1 The Intervention Tools of the Framework

One of the most important features of the tools to support the Implementation Framework is that they have the ability to adapt and be tailored to the needs of each individual project they are being applied to. The intervention tools developed to support the framework will be adaptable depending on the context and characteristics of each project. As illustrated in Table 4 each process-based change project has different characteristics. For example process-based change projects are different sizes, complexities and involve and affect a different number of people. In addition process-based change projects occur in many different company and industry contexts. The advantage of being able to adjust the framework tools is that they will be able to address the specific context of each project.

An example of where the implementation questionnaire will have to be adjusted is in a large long running more complex project. These projects are typically characterised as highly strategic, with much organisation structure change and are more complex with many variables. A larger longer questionnaire may be required as more questions will need to be added to audit the variables affecting implementation completely. Another example may be where a project is characterised by high human resource requirements, many employees involved and affected by the change and much change required in the user organisation. The questionnaire in this case would be larger as it is adjusted to include additional questions on user involvement. Alternatively a project that is characterised by good project management in a company that has a history of effective use of project management may require a smaller sized questionnaire with less questions about the project planning and management theme of the framework.

It is intended that practitioner's who use these tools should be involved in the project from its beginning to its completion. Typically, the practitioner could have the role of project

manager, project team facilitator, team leader or project sponsor.

It is very important to note that these tools are not stand alone solutions to improving implementation. They support the framework in providing a method to address the factors that inhibit implementation together as a whole, from process change conception to complete successful implementation. In order to ensure the factors of the framework are addressed throughout the life of a project it must be assured that the framework and its tools should be used in conjunction with a formal project management system.

9.2 *Project Management*

Project management involves co-ordinating the use of human resources, systems and planning and management techniques throughout the complete project life cycle.

Typically the aim of project management is to achieve the goal of the project. Buchanan and Boddy (1992) state that ineffective clarity and specification of project definition, objectives, responsibilities, deadlines and budgets and ineffective monitoring and control of project can lead to implementation failure. Buchanan & Boddy (1992) suggest that the solution to effective implementation is 'primarily in the domain of project or change management'. The implementation framework supports this view by recommending a project management system be used to manage the implementation of process-based change through each stage of the project life cycle.

The importance of project management to successful implementation has evolved from theoretical and empirical evidence. Earlier in the literature review, the main stages of a project life cycle were discussed. A project manager should manage the project through its life cycle from project initiation to completion. A methodology such as MITP (Management of the Implementation of the Total Project) should be used to guide the project manager through the activities and procedures that should be carried out at each

stage of the project. Generally the methodology should advise the project manager how to define the outcomes and activities required to successfully implement the project, how to monitor and control activities and progress, how to take actions to revise the project plan when deviations occur, where changes are required or where actions slip behind schedule. In particular project management should be used to manage the consideration and inclusion of all aspects of the framework.

Particular focus should be placed on the specific project management problems that have been important in this research, such as planning the whole project from conception to completion. Future projects this framework is applied to may require emphasis on different aspects of project management. This should become clear from the implementation focus group and the implementation audit questionnaire, as will be described next.

9.3 *Implementation Focus Group*

The purpose of the focus group is twofold. Firstly the focus group is used to understand the themes of the framework within the context of the particular problem situation being investigated. Walsham (1993) states that the factors affecting implementation are only 'simplistic concepts' that 'may be helpful to include in a broader analysis'. Walsham recommends that understanding the context and management of the process is far more important. Secondly the output of the focus group may be used as input to the questionnaire design.

Setting the framework in context includes, gaining an understanding of to what extent each theme is important and what specifically, about each theme that is important. If for example, it is unclear who the project sponsor is, it would be very important to focus on the senior management commitment theme. Alternatively if a project management

structure were already in place, with formal project planning and management standards to follow and a project manager is already assigned, then the project planning and management theme would be less important to focus on.

Wagner and Spencer (1996) suggest that focus groups may be 'used early on in the survey design process to identify the content areas the survey should cover'. The outputs of the focus groups may be used to change the emphasis of the standard questionnaire format if required. For example, if it becomes evident from the focus group that user involvement is an issue of great concern, then several more questions could be developed to diagnose this theme in even greater detail. On the contrary where a theme is very well addressed, then some questions could be removed if required.

9.3.1 Focus Group Process

The focus group should be held at a very early stage in the implementation. This ensures that all themes of the framework that are crucial for successful implementation are considered from implementation initiation. The focus group should be the first group meeting about the process change, before any formal project management system is put in place. For, after the thorough problem investigation (held in the focus group), it may be decided that the process change is unrealistic and not feasible.

For the testing it was decided that the focus group meeting would be a facilitated session taking place over half a day. The main objectives are to gain commitment to the project and to investigate the problem situation from the key stakeholders perspective. Examples of stakeholders may be a senior manager involved in the problem situation or specialists and key users in the area. The attendees at the workshop should be the project owner, project sponsor (possibly the same person), a key user or specialist from all areas affected by the problem situation being investigated and the project manager (if known).

Although the focus group aims to explore each of the themes, the process should be explained so that it is 'meaningful to others' (Eden and Huxham 1996). Thus, the focus group process is presented in general terms, rather than the academic terms attached to the framework themes. An example format that the focus group could follow is shown below. The facilitator should navigate the focus group attendees through this agenda.

- Introduction - (Project Sponsor and Process Owner)
- The Problem
- The Goal of the Project
- Scope of the Project
 - ⇒ People
 - User Involvement
 - Senior Management Commitment
 - ⇒ Process
 - ⇒ Systems
- Project Management System
- Feedback

9.3.2 Focus Group Questions

Developing the questions in advance of the focus group is very important, as 'quality answers are directly related to quality questions' (Krueger 1994). To obtain the maximum information and elicit the best response, questions must be carefully worded and phrased.

Each item on the focus group agenda is aimed at addressing a different theme or sub-theme of the framework. For each item on the agenda a set of questions has been suggested. For example, focusing discussion around the problem and goal of the project is aimed at addressing the analysis of the problem situation. This will help to gather as much information about the problem situation and alternative methods of solving the problem as possible. The facilitator's questions should include:

- What is the problem we are investigating?
- How should this problem be investigated?
- Who should do this investigation?
- What other projects will be affected by this project and which projects will have an effect on this problem?
- What methods of problem solving could be used for this project?
- What would be a good way to measure the success of this investigation?
- What should the goal of this project be?

Suitable questions that may be used for the remaining items on the agenda can be seen in Appendix 5. The outputs from the session should be recorded by the facilitator. The data should be written up and presented in a report. The report should be distributed to the attendees of the focus group and the employees who will become members of the project team.

The information should be used as input to direct the project start-up meeting. This

meeting should be part of the formal project management system, where the project goal, objectives, boundaries, timescales, risks, assumptions and dependencies are agreed.

Arrangements for this type of meeting should be brought up in the focus group if it does not arise naturally.

9.4 Questionnaire

One of the uses of the focus group was to ensure that each theme affecting implementation was considered at the beginning of the project. Running this focus group, did not however, guarantee that the themes of the framework would continue to be considered as the project progressed. The method chosen to assess the themes of the framework throughout the project was a questionnaire.

The purpose of this questionnaire was to audit each theme of the framework and to identify areas in a project that may need some additional work or attention. Where the analysis of the questionnaire shows there may be some inadequately developed areas, then these areas can be improved by a focused intervention from the project team. The questionnaire may need to be run on several occasions throughout the life of the project to guarantee all themes continue to be considered.

Questionnaires have limitations. They do not allow probing or clarification of answers, it is difficult to stop partial responses or to monitor honesty and sincerity of answers (Sarantakos 1993, Robson 1993). However, running a questionnaire was chosen as an appropriate method to collect data in this situation. A considerable amount of data needed collecting on the themes and sub-categories of the themes. The number of people from whom data needed to be collected was also potentially very high (every user affected by the process change). Running a questionnaire had the advantage of being less time consuming for the respondents and more convenient, as they could complete it at their own

convenience (Sarantakos 1993). Using a survey approach meant that the opinion of all those affected by the change could be gathered and information on each aspect of the themes could be collected. Alternative research methods such as interviews or focus groups would have been too time consuming, expensive and unsuitable for gathering the breadth of information required.

Questionnaires have been used to investigate implementation previously. Ginzberg (1979) used a questionnaire to analyse the process of implementation. The seven stages of the Kolb and Frohman consultancy model (scouting to termination) represent the implementation process. The questionnaire was used here to test whether implementation success is more likely if each stage of the project is handled favourably.

Several questionnaires were examined to assess their usefulness and appropriateness for auditing the themes of the implementation framework. Project management, teamworking, user involvement, organisational culture and implementation questionnaires were analysed.

Table 7 lists the questionnaires assessed.

Questionnaire	Source
Change Readiness Assessment	Parker (1997)
Organisational Culture Inventory	Cooke and Lafferty (1987)
Business Culture Analysis Survey	IBM Consulting Group (1993)
Dimensions of Culture,	DOCSA (1992)
MITP Standards Checklist	IBM (1991, 1995)
Change Resistance Scale	ODR (1991)
Sponsor Evaluation	ODR (1991)
Change Agent Evaluation	ODR (1993)
Total Quality Management Questionnaire	Almadi and Helms (1995)
Employee Survey Inventory	King and Ehrhard (1997)
6 Tough Questions to Assess a Learning Organisation	B Willard (1994)
Implementation Assessment Analysis	Meredith (1981),
Quality Orientation Questionnaire	Smith et al (1992),
PCOC Culture Questionnaire.	Brown (1998)

Table 7: Questionnaire's Assessed

The aim of the implementation questionnaire was to audit every theme of the framework.

None of the questionnaires studied was completely appropriate for assessing each of the framework themes at the same time. The researcher decided the best approach would be to

develop a specific questionnaire. The questionnaire designed was called the Implementation Audit Questionnaire. The questionnaire did not aim to measure the 'best' or 'worst' factors or to prioritise factors affecting implementation from the 'worst' to the 'least'. The focus of the questionnaire was to identify areas of concern, so that a focused intervention to improve implementation could be planned by the project team. A specimen copy of the questionnaire can be found in Appendix 6.

The Ginzberg (1979) questionnaire did survey the complete implementation process, (although the whole survey was not available). The dependent variable being tested was similar; 'success of the implementation effort'. The independent variables being tested were different. The different stages of the Kolb & Frohman consultancy model were the independent variables. One of Ginzberg's conclusions was that each issue affecting implementation should be treated as an independent variable, rather than each stage of the implementation process. This is the approach taken in the design of the Implementation Audit Questionnaire.

In addition, Ginzberg's studies help to illustrate another advantage of the designed Implementation Audit Questionnaire. Ginzberg's questionnaire was a retrospective study. Studies of past events are subject to change over time, people's perceptions change as a result of the individuals' more recent experiences; such as use of the system. Ginzberg concluded that if projects could be studied 'real time' then some of the disadvantages of retrospective studies could be removed. The audit questionnaire was a 'real time' questionnaire that aimed to identify problems 'in the moment' so that an intervention could be planned to improve the situation and eventual implementation.

Each of the questionnaires assessed was of fixed format. Questions could not be adjusted according to the context of the process change being audited. As recommended by Kraut

(1996) and Wagner and Spencer (1996) outputs from focus groups can be used to develop questions within categories; additional questions can be inserted or unnecessary questions removed. It is possible to develop a questionnaire that is sensitive to the context under examination. This suggestion was adopted by the researcher. As described in the previous section outputs from the Implementation Focus Groups were used as input to the questionnaire design. A template questionnaire was developed (Appendix 6) that questions can be added or removed from depending on the context and characteristics of the project.

9.4.1 Questionnaire Design

The process of questionnaire design is often divided into a step by step approach. Davis (1996), Sarantakos (1993) and DeVellis (1991) have suggested such approaches. Brown (1998) has customised the DeVellis's (1991) eight steps to scale development to a five step approach. This is the approach that was followed to design the Implementation Audit Questionnaire.

1. Clearly outline what is to be measured. The researcher should explore in detail and be certain of exactly what areas need to be measured.
2. Generate an item pool. A large number of possible questions should be developed. The number of questions should be reduced by choosing the ones most relevant to the questionnaire's purpose.
3. Determine measurement format. In parallel to generating the item pool thought should be given to the type of measurement system which would be most appropriate to the type of information being collected.
4. Review item pool. The pool of questions should be reviewed and refined by several experts.
5. Pilot test. The final questionnaire should be tested on a sample number of users.

Refinements and amendments should be made to the questionnaire where necessary.

9.4.1.1 Item Pool

Originally one hundred and forty one questions about the themes and their different aspects were collected and generated. The questions were reviewed by several process improvement specialists at various stages throughout the filtering process. Through an iterative process of refining and reviewing, the number of questions was narrowed down to seventy seven.

9.4.1.2 Scale Development

In parallel to generating an item pool the scale that will be used to measure respondents' attitudes to the questions should be decided. Several types of scales can be chosen, including nominal, ordinal or interval scales. The least sophisticated scales that provide simple classifications are nominal. Ordinal and interval scales allow the objects under study to be ranked (Chisnall 1992).

A ranking scale was chosen for this research. Some of the more popular scaling methods are Thurstone's equal-appearing intervals, Likert summated rating, the Guttman scale and Osgood's semantic differential scale. The scale that was chosen for the implementation audit questionnaire was the Likert scale.

The Likert scale is 'one of the most common item formats' (DeVellis 1991) to measure respondents' opinions. Typically, this scale is a five point scale where one indicates a strong disagreement to the question and five indicates a strong agreement with the question. The middle choice is often used to indicate a neutral response (neither agree or disagree). Other scale choices can be taken, such as three or seven points. The main reason for using a different scale is if the number of choices the respondent requires needs to be restricted or expanded.

The Likert scale is popular as respondents can easily rank the strength of their opinion about a statement along a continuum. The Likert scale is an advantageous method of attitude measurement, as it has 'good reliability' and is simpler to construct than other scales, such as Thurston. From a respondent's point of view the scale allows more choice and freedom of choice; the respondent is not restricted to an agree or disagree choice (Chisnall 1992).

9.4.2 Questionnaire Validity

The researcher must be sure that the scale is measuring what it is suppose to. A scale that is not measuring what it is supposed to is of little help to the researcher and is invalid (Davis 1996). Generally validity is measured by content, construct and criterion-related validity.

9.4.2.1 Content Validity

This type of validity is concerned with whether a set of statements covers the theme under study. DeVellis (1991) suggests that this is easier to assess when the theme is well defined. Davis (1996) recommends four activities that can be carried out to ensure content validity. These are:

1. Search the literature for as many items to be included in the scale as possible.
2. Obtain expert's opinions on what items should be included.
3. Pretest the items.
4. Modify the scale items.

This four step approach was followed by the researcher. A substantial number of questionnaires were reviewed for suitable ideas and questions. A focus group was also run to determine appropriate questions. This pool of items was examined and pre-tested by specialists. Finally the items were modified from the reviewers' feedback.

9.4.2.2 Construct Validity

Construct validity is concerned with the relationships between variables. This measure of validity calibrates how much 'a measure 'behaves' in the way that the construct it measures should behave with regard to other measures of the same construct' (Brown 1998). Empirical data can provide some evidence of whether the measure 'behaves' similarly to the variable it is measuring. Concepts such as, user involvement, process focus and analysing the problem situation are difficult to measure. However, as discussed in the previous chapter these themes are all supported by empirical and theoretical evidence. This should ensure construct validity.

9.4.2.3 Criterion-Related Validity

Criterion-related validity is a 'practical issue rather than a scientific issue' (DeVellis 1991) that is concerned with prediction. Predictive validity is a practical issue as it is concerned with a measure's ability to predict the future level of a variable from the current measure. Criterion-related validity has been criticised; for example what criterion could be used to test the predictive validity of a scale? Davis (1996) suggests that the previous measures of validity, content and construct are more useful measures of validity.

9.4.3 Questionnaire Reliability

In addition to having a valid scale it is important to have a reliable scale. Reliability is concerned with consistency whereas validity relates to accuracy (Davis 1996). A reliable scale is one that produces a consistent and stable score. This means that responses to the same item will be relatively consistent. This is usually observed from repeating the measurement process. A scale must be both reliable and valid. A scale may be shown to be reliable, but if it is not measuring the concepts or themes it is meant to then it cannot be described as valid.

Reliability measures the internal consistency of a scale. Internal consistency is measured by the extent that items within a group correlate to each other. Where items closely inter-correlate then they can be said to be measuring the same theme.

Two methods available to measure internal consistency are split-half technique and Cronbach's alpha. Split-half technique involves splitting the results of the questionnaire into odd and even numbers or simply in half. The results of the two halves or the odd and even responses should then be compared. The split-half technique is subject to limitation, as the measure is dependent on how the researcher chooses to split the items (Davis 1996). Cronbach's Alpha is a widely used statistical measure of the internal consistency of a multi-item scale (DeVellis 1991). This technique overcomes the problem of how items are divided in the split half technique (Davis 1996). A Cronbach's alpha score was calculated for each set of items in the implementation audit questionnaire (i.e. each theme of the framework).

Cronbach's alpha calculates the 'proportion of variance in the scale scores that is attributable to the true score' (DeVellis 1991). A measure's reliability is equal to the

amount of total variance between items that is caused by the latent variable. The latent variable is 'the underlying phenomenon or construct that a scale is intended to reflect'(DeVellis 1991). The alpha formula calculates the amount of total variance of an item set that is unique. This score is then subtracted from one to deduce the proportion that is due to the latent variable and multiplied by a correction factor.

An alpha score is influenced by the amount of covariation among items and the number of items in a scale. The alpha score measures whether responses to questions are consistent. Typically, the more items in a scale, the higher the alpha score. Possible alpha scores vary between 1 and 0. Higher scores indicate good quality of questions, where they are more likely to have covered the subject area in depth. Scores over 0.7 show good reliability and scores over 0.8 indicate very good reliability (DeVellis 1991). The alpha score for the questionnaire would have to be recalculated each time the questionnaire was altered.

9.4.3.1 Refining the Questionnaire

Several questions were developed for each theme so that all aspects of the theme were explored. The questions were distributed amongst the themes depending on the number of issues raised during the focus group. For example twelve statements were developed for the Senior Management Commitment theme, whereas twenty one statements were developed for the process focus theme.

Nineteen of the questions were reworded to be negatively phrased. Negatively worded statements were included to reduce the respondents tendency to answer positively.

DeVellis (1991) describes this inclination as 'acquiescence, affirmation, or agreement bias'. The negative questions were distributed at random throughout the questionnaire.

Including negative statements does have disadvantages, such as confusing the respondent, particularly when answering a longer questionnaire.

9.4.3.2 Pilot Testing

The final questionnaire was tested by two process improvement specialists. Slight amendments were made; for example two questions were separated from the main questionnaire as they were only applicable to those who would use the process. The corrected questionnaire was administered to eleven users.

9.4.3.3 Administering Questionnaire

The intended audience for the questionnaire was each employee who was closely involved and affected by the process change. The questionnaires could be distributed and collected via e-mail, or by post.

The raw data should be collected from each of the respondents. The scores allocated to each question should be entered into a spreadsheet, for ease of data manipulation. The questions were categorised in the spreadsheet according to which of the five themes they related.

The number of times the questionnaire requires administering will depend on the individual nature of the implementation project. Where a project has a short life cycle the questionnaire may only need to be run once. A longer project may need more monitoring thus, the questionnaire may need to run more than once; for example the questionnaire could be run in the planning stages and then in the implementation stage. Where the questionnaire needs to be run more than once the number of people who should be surveyed and the related cost and time this will incur will have to be considered. The additional cost and time should be balanced against the additional benefit to be gained from running the questionnaire multiple times.

9.4.4 Questionnaire Analysis

Analysis of the responses should be carried out by question and by respondent. Each question should be analysed individually and each group of questions that relate to a theme should be analysed together.

Analysis by respondent, such as average response per theme and over the whole questionnaire is important. This analysis will indicate if there were any patterns in the responses from the different groups surveyed. For example differences of opinions between different user groups or project team and management could be indicated.

The type of statistical analysis applied to the results will depend on the number of respondents. Where the number of respondents is low (less than 30) then simple statistical analysis will be appropriate, such as mean and standard deviation from the mean. Where a larger sample size has been surveyed more sophisticated multivariate analysis can be used; such as factor analysis.

Where the number of respondents to the survey is small it is important that additional statistical measures are used to analyse the raw data. The variance of the response for each question could be calculated. A high variance score would indicate that there was little consistency in the responses offered. This could indicate either a badly worded question which should be edited or rewritten or a complete difference in opinion which may need investigating.

9.4.5 Questionnaire Feedback

Once the questionnaire has been run and the responses collected and analysed, the results should be fed back to the project team. Hinrichs (1996) suggests that feeding the results of the questionnaire back to the project team is important for two reasons; firstly, 'feedback and discussion help clarify issues, arouse awareness, generate feelings, and make the members of a unit open to new ideas and plans'. In addition, 'feedback points out needs, suggests desirable outcomes, and energises employees to search for paths to attain those outcomes'.

The project team should discuss and analyse the results. Where necessary actions to improve the situations where a question or theme scored a lower than average response should be put in place.

It is most likely that the questionnaire will have to be carried out on several occasions as the project progresses. The format of the questions may have to change depending on the stage of the project. Questions may have to be tailored to different respondents depending on who is involved in the project at the time, or if the questionnaire is run near the end of project, questions that refer to initial analysis of the problem situation may have to be removed or tailored. This will ensure that the framework is considered throughout the implementation of the project.

9.5 Process for Using the Implementation Framework

The process that the researcher will follow for using the Implementation Framework is divided into seven steps. The steps include; running a focus group, designing, administering and analysing the questionnaire and feedback of results to the project team. It is intended that a practitioner wishing to use the Implementation Framework will be able to follow the step by step approach presented below.

1. Identify focus group attendees. The key project stake holders will be asked to attend the meeting. The minimum attendees will be the project sponsor, the project manager (if known) and representatives from the key areas affected by the change. A mixture of departments and management levels will be important so that as many different perspectives about the problem situation can be collected.
2. Run focus group. The focus group will be a half day (typically four hours) facilitated session. The agenda suggested in section 9.3.1 will be followed. The agenda is agreed with the attendees in the meeting as items may need to be added or removed. The outputs of the meeting will be recorded by the facilitator and written up in a report format for each attendee.
3. Establish project management system. The focus group will decide if the project goes ahead; for example, it is a real problem that needs addressing and is it a feasible project in terms of time, money and resources required. Once the project has been authorised the project management system will be established. Key activities will include; assigning a project manager and project team, holding a project kick-off meeting to define project aims, objectives and project boundaries, developing a project plan for the whole project and writing a business case. The overriding purpose of the project management will be to manage and monitor the progress of the project so that it achieves its objectives, on time and to budget.

4. **Establish project team.** A project team will be formed to carry out the project work. Representatives from each area of the business directly affected by the process change will be included on the team.
5. **Design questionnaire.** The focus group outputs will be used to contextualise the implementation audit questionnaire; for example where the focus group has indicated that one area may require more attention then additional questions may have to be developed and added to the proposed questionnaire (Appendix 6). The suggested questionnaire design process will be followed once the additional questions have been designed.
6. **Administer questionnaire.** Where possible all employees who are directly or indirectly affected by the change will be asked to complete the questionnaire. If there are a large number of users a sample of the users may be used.
7. **Data analysis.** In parallel to designing and developing the questionnaire a pre-prepared spreadsheet for responses will be created. Data will be analysed by theme and respondent. As discussed in section 9.4.4, the type of analysis that is used on the data will vary depending on the number of respondents.
8. **Feedback results to the project team.** The questionnaire results are used to indicate the themes that require attention. The results will be presented to the project team as soon as possible after administering the questionnaire, so that the findings are as relevant as possible. It is proposed that the project team will use the results to plan interventions and improve the status of the theme or themes.

9.6 Conclusions

This chapter has explained the tools associated with the implementation framework. The researcher has tested the framework and its tools on a fourth project in IBM PSS. The project ran from January 1997 to January 1998. The framework and tools were modified in this time. Feedback from users of the framework indicates that the application of the focus group and questionnaire have been very helpful. The following chapter will describe the project and the results of using the framework.

Chapter 10

Validation of the Implementation Framework

In order to validate the Implementation Framework the framework needed to be tested on a project. The researcher became involved in a fourth process implementation project. The Implementation Framework was applied, tested and further developed on this project.

This chapter follows the development of the project up to and including the administration of the first Implementation Audit Questionnaire. Using the framework to manage the project set-up by applying the Implementation Focus Group and Implementation Audit Questionnaire is presented.

10.1 *Project Background*

The fourth project ran from January 1998 to January 1999. The project was a process-based change implementation project that dealt with reviewing planned product service costs.

The need for this process implementation became apparent during a previous process re-engineering project. The previous re-engineering project was focused on improving the process for managing the preparation and completion of bids. The bids in question were concerned with winning contracts to provide customers with IT support and maintenance. For each product the expected (planned) cost of providing maintenance was calculated. This cost was the key input used in calculating the total cost of providing maintenance quoted in a bid.

As the bid re-engineering project progressed the process owner realised there was no

process in place to ensure that the most accurate and up to date product service costs were available. If this process were not put in place then products might not be priced accurately. This was a very important project for IBM PSS as where products were over-priced this would be uncompetitive and contracts might be lost and where product service were under-priced then losses would be made. Accurate product service costs for bid proposals are therefore essential to manage cost so that the right product service and the right price are calculated. Winning new customer maintenance contracts and retaining existing contracts depended significantly on the success of this project.

10.1.1 Project Objective

The objective for the project was collectively agreed as:

'To provide the business with an accurate, constantly reviewed and up to date set of planned costs, so that profitable contract pricing is ensured into the future.'

10.1.2 Benefits from the Project

The benefits that would be gained from this process implementation were difficult to quantify in monetary and time terms. The process was a new way of working that had not existed before; comparisons between the old and new way of work were not possible.

Prior to this project no comparison of planned to actual product cost occurred. IBM UK was the first part of IBM to put such a review in place. According to the sponsor 'it is the competitive nature of the UK IT industry that has driven this need for extremely accurate product service costing'. General benefits hoped for from this process change include:

- Control of the product service cost (first time ever)
- Detailed management of each element of the cost of service delivery.
- Improved control of product service costs
- Accurate prediction of gross product yield for contracts.

Specific benefits of the process implementation would include, time savings produced from automatic report generating of 'out of line' products. Out of line products are those not maximising their profit. Product Planners could spend at least 30% of their time gathering information on these out of line products. An automated solution could produce these reports in seconds.

The main financial gains from the process would be produced from the ability to be able to make precise management (business) decisions about the products that should be supported and product markets that IBM should be competing in. This was possible, as the product costing information available would be extremely accurate. Other financial gains would be created from the ability to closely manage any deviation between the planned and actual costs.

In addition, the process will improve the product planner job. Product planners work will become process driven, the way they work will be structured and consistent, rather than each planner working in a unique individually preferred way.

10.1.3 Method of Problem Investigation

In order to validate the framework the researcher required a role that would allow freedom to influence the way the project was managed. Thus the researcher took the role of project manager. The researcher managed the project from the initial problem investigations through to implementation of the process and supporting information systems.

Initially the framework was used to manage the project set-up activities. The Implementation Focus Group was used to ensure the themes of the framework were considered from the beginning. This also ensured the problem situation was thoroughly analysed.

The framework was used to guide the setting up a project management system. This included running and a Project Definition Workshop, forming a project team and establishing a method to complete project work.

The user involvement aspect of the framework was applied by forming a project team. This element of the framework was also applied by involving users in process analysis, design, pilot testing and information system design and testing. Communication such as presentations in team meeting was also used as a method of applying this theme.

The process focus aspect of the Framework was applied by ensuring project team work included thorough process analysis, design and testing activities.

The senior management commitment aspect of the framework was applied by ensuring that a project sponsor was assigned to work on the project. This aspect was also applied by ensuring that commitment to the project was gained from the relevant senior management.

A final aspect of this theme was whether a change agent is required. This requirement was considered by the project team.

Finally the tool that was applied to ensure all the aspects of the Implementation Framework were considered throughout the implementation project was the Implementation Audit Questionnaire. The Questionnaire was first administered 2 or 3 months after the Implementation Focus Group to ensure all themes of the framework are being considered. Thereafter the questionnaire was administered at the process implementation stage of project progress to ensure all framework aspects continue to be considered.

Although the main method of problem investigation was to follow the framework, firstly the researcher had to understand the project. To develop a greater understanding of the problem situation the researcher conducted ten interviews and many follow up discussions with key professionals and managers involved in the problem. The interviews typically included questions such as:

- What problems are there with the current situation?
- What projects will be affected by the process change?
- Who is involved in the process?
- Who benefits from the new process?
- What should the purpose of the process be?
- What does the process look like currently?
- What are the cultural issues involved in this project?
- What are the political issues involved in this process?
- Who should be the owner of this process?
- Who would have different perspectives on this process?
- What other projects will this process be dependent on and have an effect on?

After the first three interviews the problem became extremely complex. In order to illustrate as many aspects of the problem in one place, a 'rich' picture of the current

situation was created. Figure 12 illustrates the systems, people, processes and projects that were involved in the problem. This 'rich' picture was altered and developed in subsequent interviews and discussions.

At the beginning of the project the manager of Product Planning expressed some dissatisfaction about the project. This manager had responsibility for all Product Planners and he felt that he should own the project. Once a method of communicating project progress to this manager had been established and he had agreed to the project structure, the resistance to change decreased.

10.2 Implementation Focus Group

The next stage of the Implementation Framework was to hold the Implementation Focus Group. The purpose of this was to ensure all factors important for successful implementation were considered at the beginning of the project. The attendees of the meeting were the sponsor, a representative from the two areas affected by the project and the Bid Process Project Manager.

The focus group was held at the beginning of February 1998. The focus group was facilitated by the project manager and took place over three hours. The meeting followed the agenda suggested in Chapter 9 and asked many of the questions noted in Appendix 5. The subjects discussed included a goal for the project, the scope of the project, such as what people, processes and technology would be involved and the structure of the project management system.

The first decision to be reached was on the goal of the project ('to provide the business with an accurate, constantly reviewed and up-to-date set of planned costs, so that profitable contract pricing is ensured into the future'). Next, the people, process and technology directly and indirectly affected by the process implementation were defined. It was decided that the best way to get the people directly affected by the process change involved in the project, was to form a project team. The team would include a representative from each area of product planning. The sponsor of the project agreed to ask the individuals identified to join the project team and to attend a project definition workshop.

It was decided that there was a requirement for communication about the project. The type of information required would be tailored to the audiences; specific information to people directly affected by the project and general information to everybody else.

Commitment to the project was discussed. The sponsor of the project was confirmed.

Several senior managers were identified whose commitment to the project would have to be gained. The sponsor agreed to request commitment to the project from these managers.

Initially the attendees were sceptical about the value of holding a focus group as, usually a project definition workshop is the first meeting that is held to discuss a new project. At the end of the meeting the researcher asked for feedback on the focus group and the agenda that was followed. The feedback was very positive. One respondent said it was 'a very useful prelude to the project definition workshop', another said it was 'an excellent strategy to ensure buy-in'.

The outputs from the focus group were distributed to those who were asked to attend the project definition workshop.

10.3 Project Definition Workshop (PDW)

Applying the framework ensured that a project management system was established to plan and monitor project progress. As part of the project management activity a project definition workshop was held. The sponsor invited the attendees who had been agreed in the focus group. The results of focus group and the PDW agenda were distributed before the meeting so that attendees could prepare. The PDW was held one week after the focus group and the agenda included:

- Project Scope - Boundaries of the project. What people, processes and projects should be included in the project and what should be excluded?
- Objectives - Necessary to accomplish to achieve the goal.
- Milestones - timescales, by when, by whom?
- Issues - 'Things' that have happened that may cause us to miss the goal.

- Risks - 'Things' that might happen that may cause us to miss the goal.
- Dependencies - 'Things' that we are reliant upon to hit the goal.
- Actions - Assign actions to all from above.

The activities within and outside the boundary of the project were defined; for example comparison by contract costs were excluded. Seven objectives that were required to successfully implement the review process were agreed. These included defining the inputs and outputs of the process, establishing process measurements and designing training and education material. To ensure the objectives were completed eleven actions were developed. Each of these work items was assigned an owner with a date for completion.

10.3.1 Project Team Meetings

In line with the Implementation Framework a project team was formed to complete the project work. Forming a project team ensured that those directly affected by the process changes were involved and more likely to be committed to the project from the start. Team meetings were held monthly and usually took about three hours. Originally all eight team members attended the meeting. After two meetings it was decided that the project work did not require all team members' time, so a core team of five was formed. These were the project manager, Bid Process project manager, sponsor and the two team members who were the most knowledgeable about the process to be designed. Members of the wider team attended meetings when it was relevant.

10.3.2 Process Design

In accordance with the Implementation Framework the initial months of project work were spent ensuring a complete process was being designed and implemented. The review process was designed in the first four months of the project. To enable this design, much information had to be gathered about the process inputs, outputs and triggers. The two Product Planners in the core team collected this information and developed the process.

Throughout the process design it was important to consider what requirements the process would have on other relevant projects and process changes. It was important to establish what these projects were and what timescales they were working to. The review project timescale was planned around the projects it was dependent on, for example the users could not start using the review process until the information system where the planned data would be held had been developed and released.

Time was spent providing communication about the project. An article giving a general overview of the project was published in the PSS corporate magazine. The process change and the results from the pilot testing were presented at all second line management meetings. Presentations were also given around the UK at annual PSS information exchange meetings that were taking place.

A comprehensive education program about the new process was planned. Training in the new information systems was also provided. The users of the process required training and those affected by the change in process required some education about why the process had changed, what aspects had changed and how work would be done differently.

10.4 Results of the Process Analysis

The process analysis found there was a need to provide a process to compare the planned cost structure against actual costs. Where the planned costs varied greatly from the actual costs the planned cost required updating to correct the deviation. However, as there were 8-10 thousand products it was unrealistic, from a time and cost point of view to expect a comparison of actual and planned cost for every product. A process to manage those products costs that most urgently required reviewing was needed.

10.4.1 Pilot Process Walk Through

In accordance with the Implementation Framework to ensure that all aspects of the process had been considered the designed process was pilot tested. The team decided to test the process on six products.

The process and the results of the walk through were presented at the project team meeting in April 1998. The pilot process was considered to be very successful. The process walk-through confirmed that management information systems would be required to support the review process. The process of comparing planned costs to actual costs for one product type took two product planners three days. To review each of the 8-10 000 products manually each month would be impossible. Information systems development was essential for successful process implementation. The human resource and funding to support this development had to be committed to the project.

10.5 Management Review Meeting

The Implementation Framework calls for senior management commitment to the project. In line with the framework the researcher arranged a management review meeting to ensure ongoing commitment and funding for the IS development was provided by the senior management. The IT Development Manager and the Services Development Manager attended the meeting. The findings and results from the process test and the benefits of the process were presented. Both the senior managers understood the importance of the process change. They both agreed to provide funding to the project and commit resource to design and develop the IS.

10.6 Implementation Audit Questionnaire

As stated in the framework a questionnaire was needed to guarantee that the themes of the framework would continue to be considered as the project progressed. The questionnaire was first administered in May 1998 (4 months after the focus group). The purpose of running the questionnaire was to identify aspects of the project that may need some additional work or attention. Where the results and analysis of the questionnaire showed there could be some inadequately developed areas, the project team would address these.

Each of the employees who was closely involved and affected by the review process project was asked to complete the questionnaire. This gave a total population of 12 respondents. An example questionnaire can be found in Appendix 6.

10.6.1 Results of the First Implementation Audit Questionnaire

The mean response for each question and the mean response by theme were calculated.

The sample size was not large enough to do more complex statistical calculations; such as factor analysis. The average score allocated by each respondent over the whole questionnaire was also calculated. This analysis was carried out to see if there were any patterns in the responses from the different groups surveyed. A spreadsheet of the results of each question can be viewed in Appendix 7.

Each question asked a respondent how much they agreed with an assertion. The possible responses that could be chosen for each question in the questionnaire ranged from 1 to 5. 1 indicated a strong disagreement to the question and 5 indicated a strong agreement with the question. Therefore the closer the mean to 5 the more favourable the response indicating that the theme or question has been addressed more thoroughly and may require less additional attention.

As the number of respondents to the survey was small it was important that additional statistical measures should be used to analyse the raw data. The standard deviation of the responses to each question were calculated. Several questions had high standard deviations; these will be highlighted throughout the questionnaire analysis that follows.

A high standard deviation may indicate that there was little consistency in the responses offered. It was important to examine questions with a high standard deviation as this could indicate either a badly worded question (that should be edited or rewritten) or a complete difference in opinion (that may need investigating).

10.6.2 Questionnaire Validity

As discussed in chapter 9, Cronbach's Alpha was used to measure the internal consistency of the questionnaire. Internal consistency is concerned with whether the responses given to the questions are relatively consistent. Cronbach's alpha is also concerned with measuring how thoroughly the questions asked cover the intended subject area.

Possible alpha scores are between 1 and 0. Higher scores indicate good quality of the questions; that is they are likely to have covered the subject area in depth. Scores over 0.7 show good reliability and scores over 0.8 indicate very good reliability (DeVellis 1991).

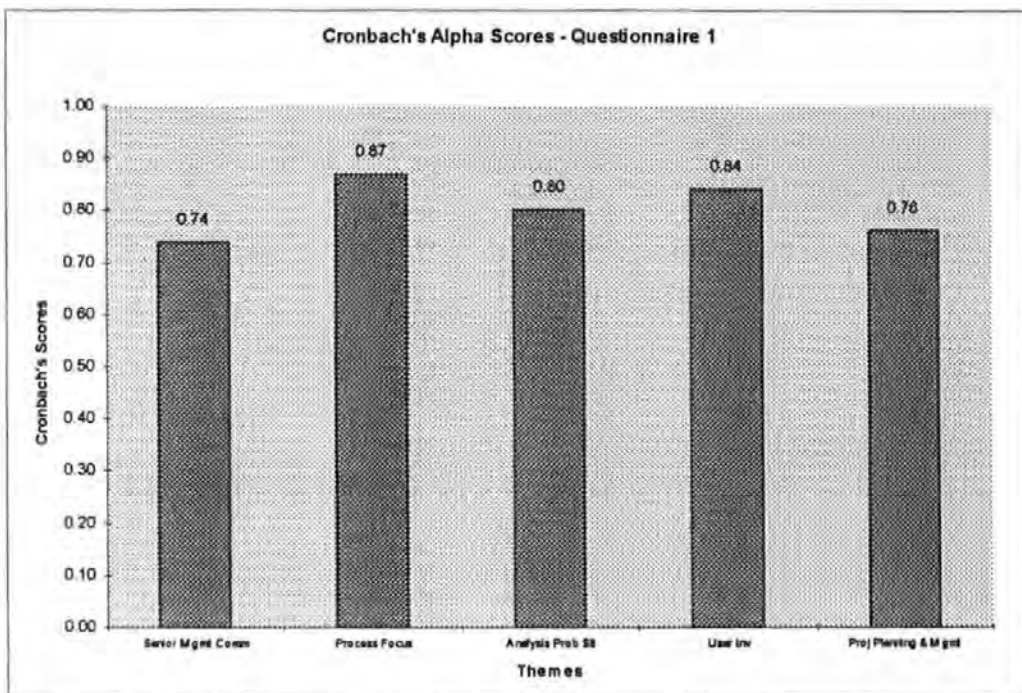


Figure 13: Cronbach's Alpha Scores for each Theme of the Framework

The Cronbach alpha score for each theme was either good (0.7) or very good (0.8) reliability. This indicates that the set of questions for each theme covers the subject area sufficiently and that there was consistency in the responses to the questions. Overall it was possible to say the higher alpha scores indicate a more reliable theme.

10.6.3 Analysis by Respondent

There were 12 respondents to the questionnaire. Each respondent answered all 77 questions. Each one's average score is illustrated below.

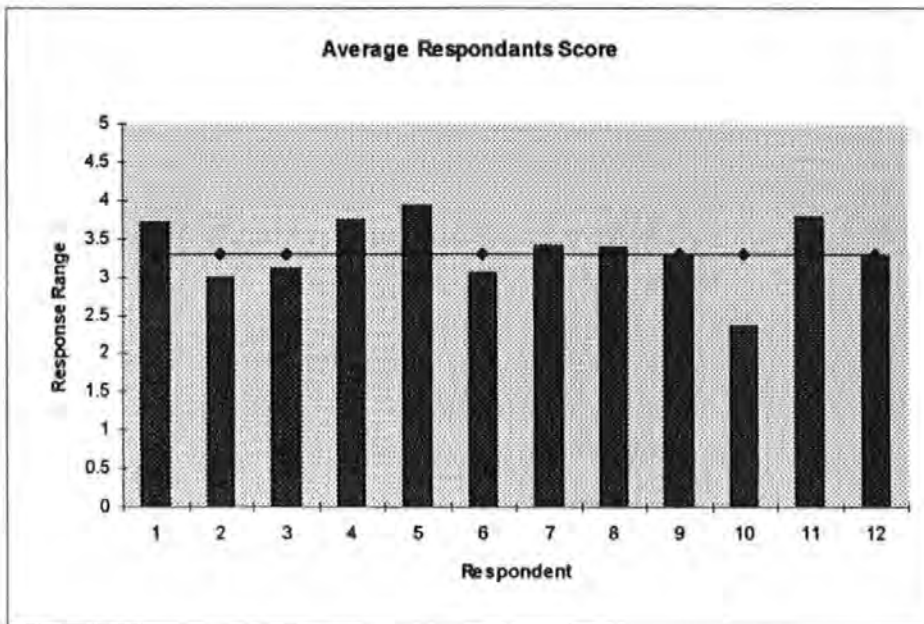


Figure 14: A Graph illustrating Each Respondents Average Response

Results

The average response was 3.34. Respondents 1,4,5,11 tended to have a higher than average response. Each of these respondents were senior management, the sponsor of the project or the team leader. Of the four respondents with a much lower than average reply (2, 3, 6, 10) three were not core project team members.

Analysis

The project team felt that the sponsor and senior management's higher than average scores was a good indication of their commitment and understanding of the project. One project team member suggested it could be possible that the respondents with the lower scores were less knowledgeable about the project. This would lead to a score of 3 (neutral - neither agree nor disagree) being a more frequent reply which might lower the average score.

The lowest average responses were given by a project team member. This could indicate the respondent has concerns about the project, and this was particularly worrying from a core project team member. It was decided that the reasons behind this lower than average score should be discussed with this team member to see if concerns about the project exist and if so how they may be rectified.

10.6.4 Questionnaire Results by Theme

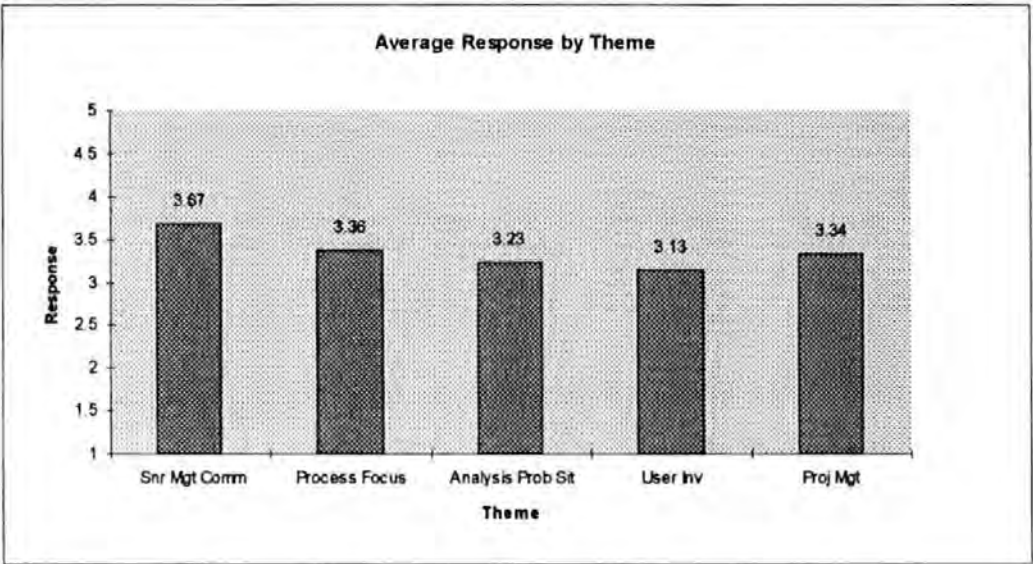


Figure 15: Mean response by theme

The above diagram illustrates that the means for each theme of the framework range from 3.13 to 3.67. The themes with the highest means were senior management commitment and overall satisfaction with the project. The theme with the lowest mean was user involvement. A detailed analysis of each theme follows.

10.6.5 Senior Management Commitment

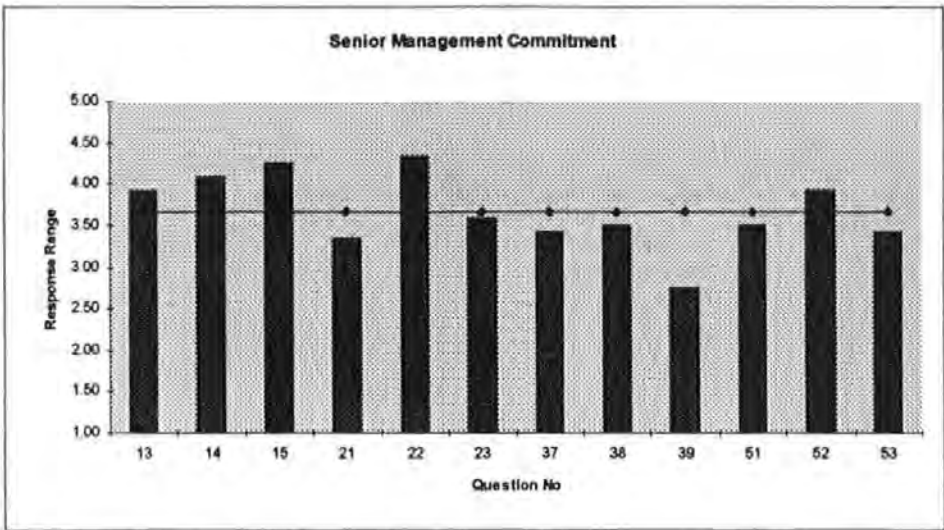


Figure 16: Results from the Senior Management Commitment Theme

Results

The overall mean for the theme was 3.67. This was the highest scoring theme mean. The highest scoring questions were concerned with whether *'the sponsor believes that there is a real need for the change'* and *'the sponsor demonstrates commitment to making the process change happen'*. Three of the questions which scored below the mean were concerned with whether a change agent was leading the change and if they were doing so effectively; for example *'a change agent (e.g. project manager, facilitator, team leader) is leading the change'*. Question 39; *'the change agent is effectively managing the change'* scored significantly below the average. Question 21 *'The sponsor is effectively leading this process change'* had the highest standard deviation (1.23) of the theme.

Analysis

The low score for the change agent questions was thought to be due to confusion over whether there was a change agent or not. There was confusion over whom he/she was and what the role was supposed to involve. The project team felt that the problem with knowing who the change agent was if indeed there was a change agent for the project, was not a problem. The sponsor of the project was extremely closely involved in the project, so

no additional leadership from a change agent was thought to be necessary.

The high deviation of 1.23 from the mean for question 21 was concerning. This indicated a wide range of responses and could mean a differing of opinion. The large range of opinions on whether the sponsor was effectively leading the process change was not considered to be a serious problem as the overall mean for senior management commitment to the project was the highest of all the themes under investigation.

10.6.6 User Involvement

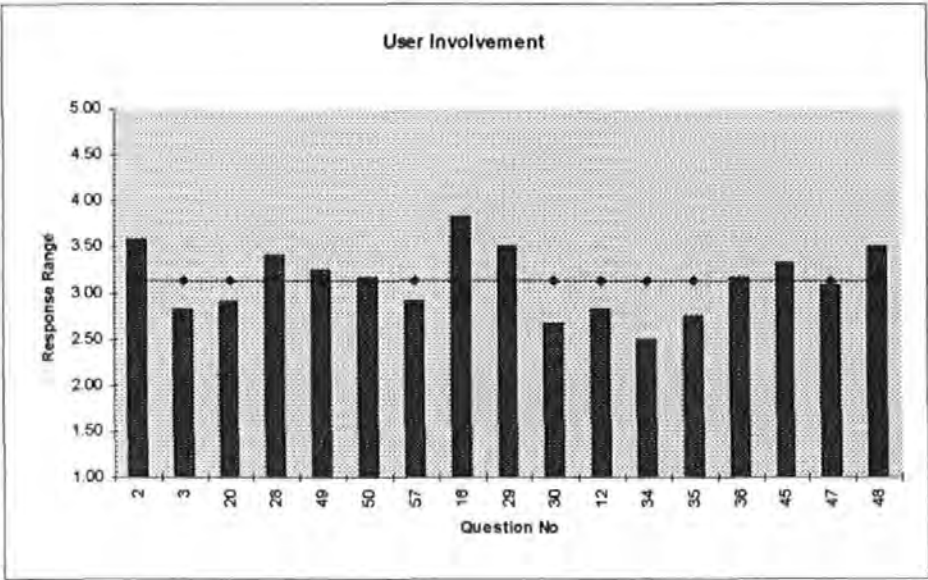


Figure 17: Results from the User Involvement Theme

Results

The questions referring to user involvement in the project have been divided into three separate categories for further analysis. These categories were specific user involvement, communication and teamworking questions. The mean for the theme as a whole was 3.15, this was the second lowest scoring theme mean.

The higher scoring questions were concerned with whether *'those affected by the process change understand clearly the nature of the problem the MOS project is dealing with'* and *'project members feel ownership of the process change'*. Of the questions that fell below

the mean, question 20 had the largest standard deviation from the mean (1.24); *'Input has been solicited from the end users throughout this project'*. Other questions that fell below the mean considered the impact of process change on the end users daily work patterns and whether people were convinced the process change was necessary.

The questions on communication aspects of user involvement (numbers 12,34,35,36,45,47,48) were related to both the internal communication amongst the project team and external communications to PSS. Questions 12, 34 and 35 scored the lowest means. These questions were *'Communications to all those immediately affected by the process change have been planned'*, *'Sufficient information about this project is being communicated in PSS'* (highest standard deviation; 1.09) and *'The information being communicated gives a clear and consistent message'*. The lower than average results indicate that external communication about the project were not as sufficient and consistent as required. The questions concerning internal communication (*'Communication between those directly involved in the project is effective'* and *'There is no co-ordination with other project teams carrying out related projects'*), scored above average, indicating good 'internal' communication.

There were only 3 questions that were directly aimed at collecting data about the teamworking (numbers 16, 29, 30) aspects of user involvement. The highest scoring question asked whether *'the project lends itself to an individual effort rather than a team-based approach'*. This question also had the highest standard deviation of 1.03. The lowest scoring question asked if those working on the project worked as a team.

Analysis

The low scores for user involvement were thought to be an accurate representation for how the project had progressed. Only a select number of users were involved in the process development at the start of the project. Plans to involve more users as the project

progressed were in place. Input from users was to be increased considerably in the information systems development. Thus, the large standard deviation of question 20 was not considered an issue.

It was thought that the results accurately reflected the amount of communications made about the project. Actions were already in place to deal with improving the external communication. Project presentations had been planned.

It was stated that there had not been much traditional teamworking, such as off-site team days to develop the new process. It was felt that teamworking should be improved within the project team. The results indicated that the project had the possibility to lend itself to a teamworking method of working; although the lower score indicated that those working on the project had not adopted teamworking as a way of working as much as possible. This idea was confirmed as the original team of 8 members was reduced to a core team of 5 people. The larger range of responses for question 16 (reflected in the standard deviation) might have been caused by the differing of opinion between the core and extended team.

The project team felt that communication among the core team was very effective, but the communication to the original team was not as thorough as it could have been. An action to address this at the next team meeting was taken.

It was concluded that the external communication of the project and the amount of user involvement required some attention from the project team. The aspects of user involvement were closely linked; for example where communications about the project could be improved then employees affected by the process change would know more about the project and as a consequence feel more involved and/or committed to the change. The risk of not addressing these areas would be that the successful implementation of the

project might be inhibited in the future.

10.6.7 Analysis of Problem Situation

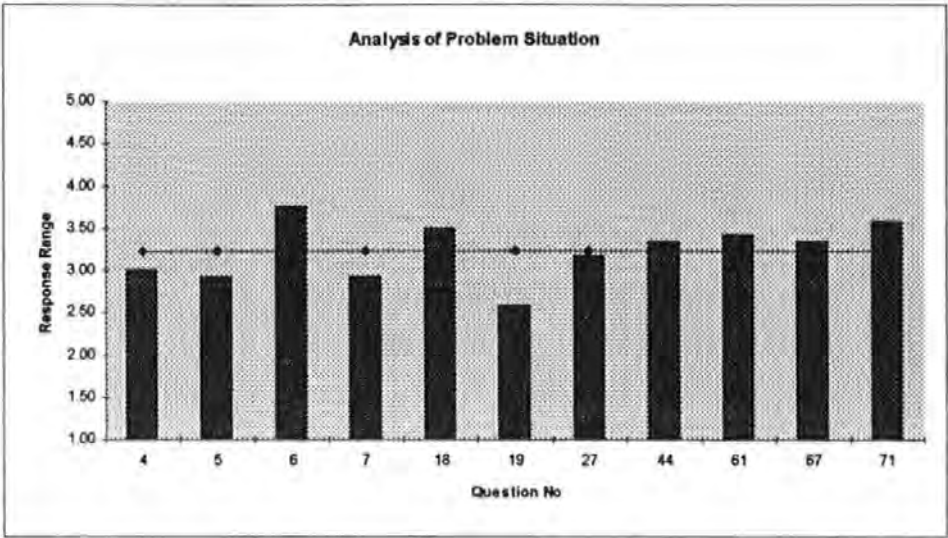


Figure 18: Results from the Analysis of Problem Situation Theme Results

A third theme which scored a lower theme mean was analysis of the problem situation (3.24). The results showed the respondents felt that *'The real problem is being addressed, and not just a symptom of a more complex problem'* (Question 6) and that the technology and human resources that will be affected by the project have been identified. The questions scoring low means were *'All those indirectly affected by the project have been identified'* and *'sufficient time was spent on investigating the problem'*. Question 7; *'Sufficient time was spent on investigating the problem'* had the highest standard deviation (1.16).

Analysis

The large deviation of responses for question 7 indicated that there was a differing of opinion about whether the problem had been addressed enough or not. After discussion the team agreed that not enough time had been spent looking at alternative ways to find a solution to the problem situation, or examining different perspectives on the problem. It was felt that there was not much that could be done to improve this situation for this project as it had progressed too far. It was noted that these were important issues which

should be given more consideration in future projects.

10.6.8 Process Focus

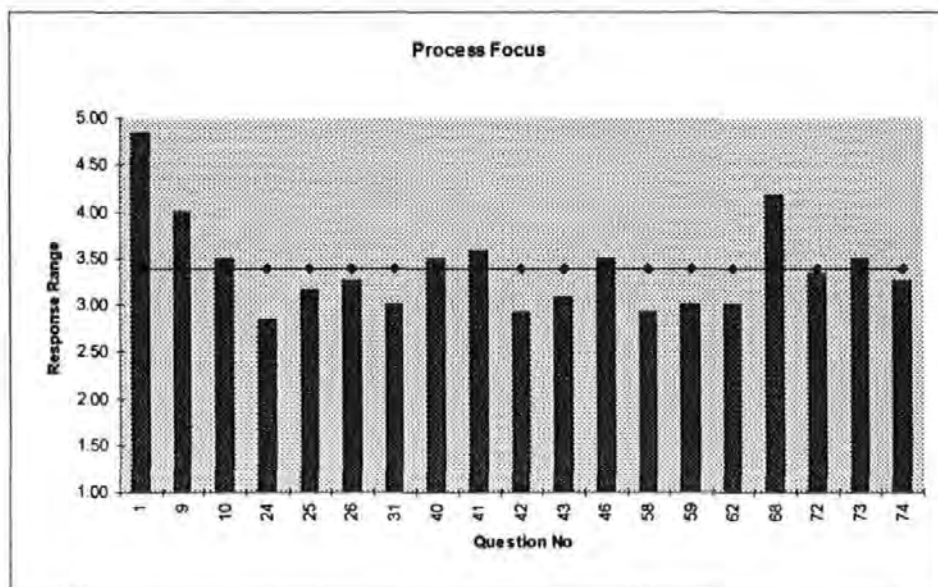


Figure 19: A Graph Illustrating the Results from the Process Focus Theme

Results

The highest scoring question was *'The process change is really needed'*, 83% of responses strongly agreed with this question (5 rating). The second highest scoring question was *'The process change will offer significant tangible benefits, such as faster cycle time, reduced number of delays, less rework, decreased costs, increased customer satisfaction'*. Questions that asked whether *'The inputs, outputs and dataflows of the process have been defined in detail'*, *'..... the process crosses functional or departmental boundaries'* and *'....is being re-engineered/redesigned rather than fixed'* achieved lower than average scores. Questions 75 (*'Once the process is fully implemented I will use the new process'*) and 8 (*'The process change will not enhance by job role'*) had high standard deviations; 1.7 and 1.31 respectively. As did question 10; *'The process owner had been identified'*.

Analysis

The project team was not surprised that where the process fitted into other process changes had a below average rating. The processes in the area of product planning and bid management were not clearly defined. It was unclear what processes provided inputs and

received outputs from the review process.

Other actions taken included identifying the processes that provided inputs or received outputs from the review process. It was also agreed that whether the process owner had end to end responsibility for the process was questionable (Q10). An action was put in place to clarify the ownership of the process at the next team meeting.

Questions 8 and 75 were concerned with whether the process would be used, once it had been implemented. Not all those asked to respond would be using the new process (such as managers) so it was reasonable that responses varied from 1 (strongly disagree (will not be using the process)) to 5 (strongly agree (will be using the process)). The team decided these questions should be separated from the main questionnaire. In addition, four key users of the new process were amongst the respondents. Each of these users (except for one answer to question 8) agreed that they would use the new process and that it would enhance their job role.

10.6.9 Project Planning and Management

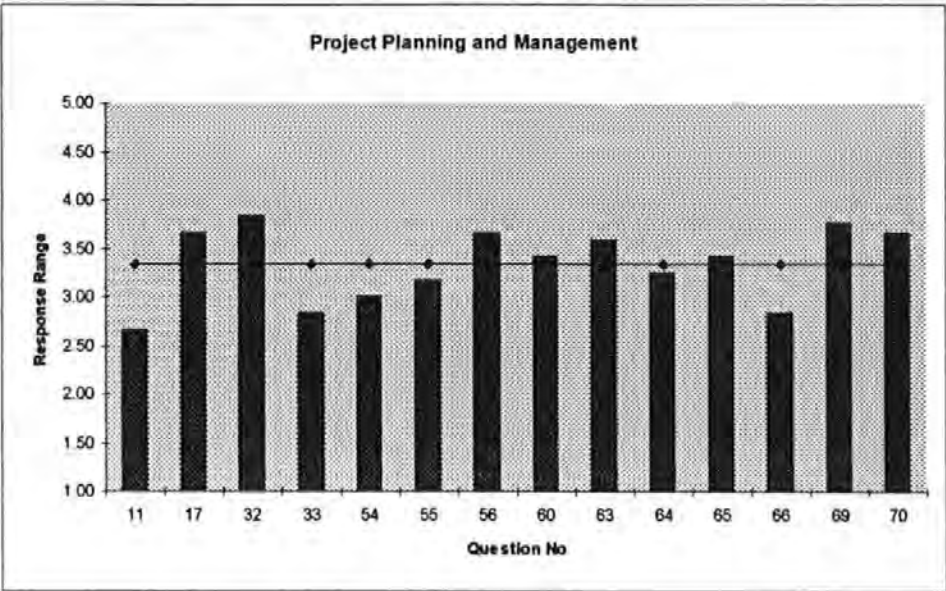


Figure 20: Results from the Project Planning & Management Theme Results

The highest scoring questions asked whether *'Members of the project work group are responsible for achieving the objectives of the project'*. Other high scoring questions asked if the project was being effectively led. Questions about whether the project plan was achievable and the project information was stored and easily accessible also scored relatively high.

The lowest scoring question asked whether *'A business case has been written for this project'*. Other low scoring questions were concerned with whether the project had been planned through to completion, had risks, assumptions and dependencies been highlighted and whether timescales were realistic. Finally, were the original aims and objectives of the project revised periodically? Question 55; *'The project timescales are realistic'* had the highest standard deviation (1.19). Question 66; *'The original aims and objectives of the project are not reviewed and revised periodically'* also had a large deviation (1.11).

Analysis

The benefits of this project had not been addressed prior to the questionnaire results being published. An action to revise the original project definition report to include the benefits had already been added in the project team's actions. The team also put an action in place to ensure the project risks, assumptions and dependencies were regularly reviewed. The lack of a business case was discussed. It was decided that a business case was unnecessary, as the senior management commitment to the project was high.

10.7 Results and Actions from the Implementation Focus Group and Questionnaire

Feedback about the Implementation Focus Group was extremely positive. The focus group was described by one attendee as enabling a *"good outline"* of what the project needed to achieve. A project team member noted that holding the focus group at the beginning of the project meant that the project *"really got off to a fast start"*. In addition, holding the focus group meant that the problem was thoroughly analysed. One attendee noted *"we could have gone off at a tangent. Running the focus group meant this didn't happen"*. Another advantage of the focus group was that the *"project was well planned and thoroughly thought through from the beginning"*. One of the most important advantages of the focus group was that it generated discussion about the problem and then facilitated agreement on a solution or a way forward.

The feedback from the project team about the questionnaire was also positive. The questionnaire was described as an *"added bonus"* as it gave the project team information about the project they would not normally have had. As described by a team member the questionnaire also provided *"a useful guide to the status of project"*. The sponsor of the project commented that *"the questionnaire was very beneficial. It made you stop and think about things like, "have we communicated enough?" "Do we have a wider audience we*

should consider?" I have never worked on a project where we took a consolidated look at where the project was. It helped to show what stage the project was at and helped to guide the project. We took stock of the project and what needed to be done in the future". The sponsor also said that the questionnaire was advantageous as it meant the project was more under "control".

In line with the Implementation Framework the results from the questionnaire were presented by the researcher in June's project team meeting. The results were discussed by the project team. The themes with the lower means were taken to indicate the aspects of the project that were weaker at the time of running the questionnaire. The project themes with the higher means were taken to indicate the aspects of the project that were stronger at the time of running the questionnaire. This led to work items being initiated to deal with weaker aspects of the project, so that success of the project could be maintained into the future.

No actions were put in place to deal with the strongest themes such as; senior management commitment to the project and the overall satisfaction with the outcomes of this project so far. The project team agreed that these aspects of the project were working well.

Actions put in place as a consequence of the questionnaire results to improve the weaker aspects included work to improve user involvement in the project as it progressed. This action included arranging a series of presentations and discussions at team and department meetings. User involvement in information systems testing was planned. Finally, a comprehensive training and education package, for the users was to be developed. Other work initiated included actions to improve the external communications about the project. An action was taken to plan a series of presentations about the process to several management teams and the customer engineer teams. In addition, an article about the

review process, its purpose and requirements was published in the company magazine.

The team considered how the questionnaire could be used in the future without the assistance of the researcher. The questionnaire was part of a framework to improve the implementation of process based change. The framework was intended for use by a project manager, team leader or facilitator to ensure aspects that influence the success of a process change project are considered throughout the life of a project. The researcher agreed that a guide should be designed for other practitioner's wishing to use the framework.

The team felt that the results of the questionnaire accurately represented the status of the project when the questionnaire was carried out at the beginning of April. Several actions were already in place to rectify many of the worrying results that were indicated by the questionnaire; for example actions were in place to improve communications externally in PSS. Where previously unidentified problems had been uncovered, additional actions to deal with them were defined; for example actions to clarify process ownership.

Overall the project team were satisfied with the project progress to date. This was indicated by the results of two project satisfaction questions in the questionnaire.

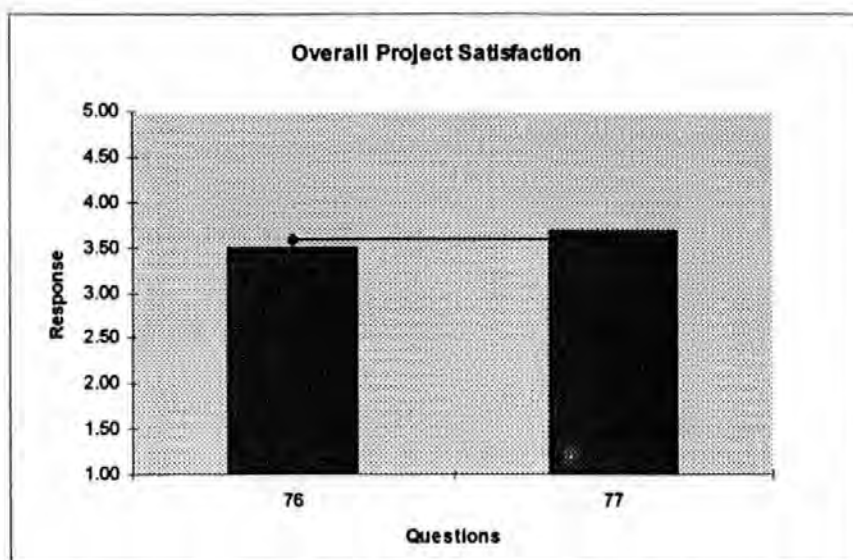


Figure 21: Overall Project Satisfaction Results

Questions 76 and 77 illustrated in figure 18 above were included in the questionnaire as a measure of implementation success. According to Ginzberg (1979) user satisfaction is an important measure of implementation success. Both of the questions concerning user satisfaction with the project scored high compared with the five other theme means analysed. The questions were *'Overall, I am satisfied with the outcomes of this project so far'* and *'Overall, I believe this project will achieve what it set out to'*. The high average score for these questions was encouraging as it indicated that users were not dissatisfied with the project to any great extent.

10.8 Conclusions

The implementation framework and its tools were tested through application to a fourth project as described above. The framework and its tools were used to help manage project set-up and project progress. The project progressed according to plan during its first 5 months.

The focus group was held at the beginning of the project. The purpose of the focus group was to ensure each of the framework themes were considered at the beginning of the project. The focus group was successful initial ideas about what the project goal should be, who should be involved, who was affected by the project and how the project should be managed were discussed. These ideas were later confirmed in the project definition workshop.

In order to satisfy the project planning and management needs of the Implementation Framework a project management system was set up. This was successfully established; a Project Definition Workshop was held where the project goals, objectives and project plan were decided, a project manager was assigned and regular team meetings were set up.

The Implementation Framework calls for user involvement throughout the implementation project. To satisfy this need a project team was formed to work on the process analysis, design and testing. This approach to user involvement worked well as it began to generate commitment to the project.

To ensure that the senior management commitment aspect of the framework was satisfied the researcher called a management meeting. This worked well, the senior managers committed human resource to develop information systems and confirmed their continued

commitment to the project.

The Implementation Framework calls for a process focus to be taken. The process was pilot tested to ensure that all aspects of the process change had been considered. This worked well as weaknesses in the process focus were noticed, such as lack of measurement system.

To ensure that each element of the Implementation Framework continued to be considered as the project progress the Implementation Audit Questionnaire was run. The questionnaire was administered 4 months into the project. The questionnaire provided a quantitative status report on the state of implementation of the process change project. The questionnaire was successful as it accurately indicated aspects of the project that required attention. Work items were initiated to deal with weaker aspects of the project and improve the likelihood of successful implementation.

Chapter 11

Use of the Framework to Manage an Implementation Project

The previous chapter has described the initial validation of the Implementation Framework. In the first six months of the project the Implementation Focus Group and Questionnaire were used to help establish the project. The questionnaire provided a useful status check on the project and as a result of the questionnaire analysis additional actions were taken by the team to address aspects of the project that required attention.

The project continued for another six months until the end of January 1999. Project work included, design and development of supporting information systems and implementation of the review process. The questionnaire was run for a second time once the information systems development was underway. The project progressed considerably from its initial start up and process redesign phases. Different departments, projects and users were involved. The following chapter will describe the progress of the project through its final six months. In addition, how the Implementation Framework was used to manage the project progress will be described.

11.1 Implementation of the Review Process

To ensure the process was completely and successfully implemented as required by the Implementation Framework the next stage of the project was to develop supporting information systems. The information systems were required to automate the planned to actual cost comparisons. Information Systems (IS) development took place from August to October 1998. Two information systems were developed to facilitate the data collection and comparison required by the review process. Six Product Planners, two Business Area Managers and the project sponsor tested the systems for two weeks.

The product planners started using the process as soon as the information systems were ready. The process was fully implemented in the last month of 1998, once the user training was completed. There were two major outcomes as a result of this project; a change in the role of a product planner and the implementation of a review process with supporting information systems, which previously did not exist.

The review process gave product planners the ability to complete the review process in two days, rather than at least a week. This dramatically decreased workload. The sponsor of the project estimated that the 'ultimate time saving could be as much as one man year for the department'. The planners were able to review product costs from the previous month two weeks earlier. Prior to the review process, the previous month's data would not be reviewed until the 25th or 26th of the following month. Product performance could now be reviewed by the 8th or 9th of the following month. The new process also facilitated the review of many more products each month.

At the beginning of the project the Product Planner's job was to 'react' to a bid situation. There was no set methodology to know what cost would be charged in a specific bid and 'The phone was always going. The screen was always full'. The role was very unproductive, work was repeated time after time, and it was a very frustrating and very demoralising role. There has been a fundamental change in the Planner's role. The new role is more proactive, where more time is spent planning. Product Planners now spend 50% of their time managing products. The Product Planners now had the time and the tools to develop their role. The sponsor said there is a 'positive view of the future'. The role was in transition phase at the moment from 'totally frantic to planning'. The team leader summed up the change in role as "the way I work will be more controlled, the output from the department will be more current and lead to better pricing, cost control and

profitability. Another possible benefit will be freeing up of resource from performing certain tasks that were previously very manual”.

The supporting systems were crucial to the successful implementation of the review process. Typically planners said that they had ‘data I never had before’ and that they ‘can see data I couldn’t before’. The new information systems took a maximum of 45 seconds to sort the product cost data in the specific order the product planner has requested. This type and depth of analysis would not have been possible before, as the information was held in a multitude of different database tables.

Above all the planning process is now based less on guesswork and 'gut feel'. One planner was noted saying ‘judgments about product cost are now made from solid data’. The ultimate aim of the Product Planner is to keep product costs down. The review process will help keep these costs to a minimum.

11.2 Questionnaire Two

The second questionnaire was administered in November 1998 (6 months after the first questionnaire). The purpose of the second questionnaire was to audit the themes of the framework, to check they were still being considered and to compare results over time. The same questionnaire and respondents were used to facilitate this comparison.

The format of the questionnaire was altered slightly. The two questions that were only relevant to the users of the process were separated from the main questionnaire. Only users of the process were asked to respond to those questions. A sample questionnaire is provided in Appendix 6.

The same analysis was carried out on the results as with the previous questionnaire. The

following results examine the internal validity of the questionnaire using Cronbach's alpha, analyse the average respondents score and investigate the scores by theme. A comparison of the questionnaire results over time is provided. A summary of the results for each question can be seen in Appendix 7.

11.2.1 Questionnaire Validity

As discussed in the previous chapter the measure of questionnaire validity used was Cronbach's alpha.

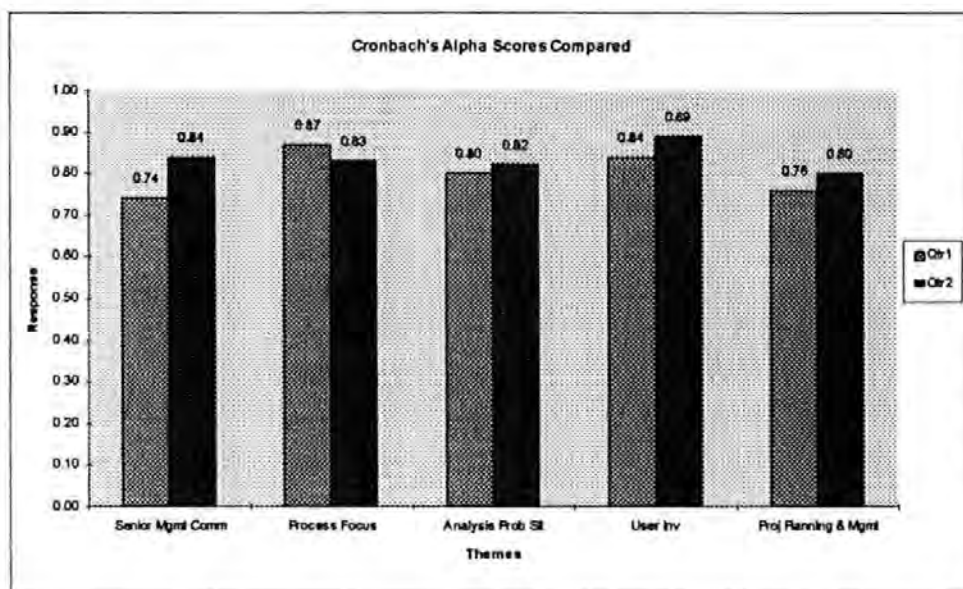


Figure 22: A Comparison of Cronbach's Alpha Scores for Questionnaire 1 & 2

The Cronbach alpha scores for the second questionnaire had slightly improved in comparison to the first questionnaire. Each theme score was over 0.8 (very good reliability (DeVellis 1991)). In four out of five themes the Cronbach's alpha scores had improved. The score for process focus had fallen slightly from 0.87 to 0.84. This was caused by the removal of the two questions relating to process use (*'the process change will not enhance my job role'* (question 8) and *'once the process is fully implemented I will use the new process'* (question 75)) and the subsequent fall in the number of respondents to these questions. As the questions have not been altered the increase in scores indicate that the consistency in responses to the questions had improved.

11.2.2 Analysis by Respondent

The original 12 respondents were asked to complete the second questionnaire. The same respondents were asked so that the results could be compared over time. Four respondents said that their opinions on the project had not changed (respondent 1, 2, 7 and 12). Thus, their responses from the first questionnaire were used in the analysis.

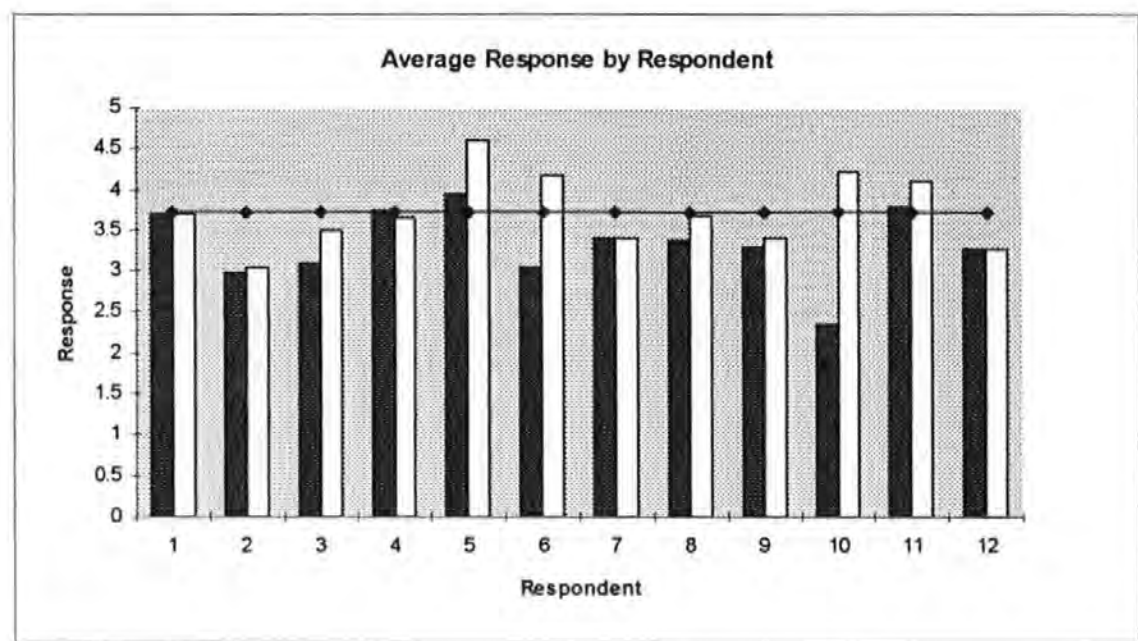


Figure 23: Respondents Average Score Compared

The average respondents score had improved from 3.34 in questionnaire 1 to 3.73. Each respondent's average responses were consistently the same or higher in the second questionnaire, except for respondent 4. Respondent 4 was not a member of the core project team and was not as familiar with the project. The respondents with a higher than average score (5,6, 10,11) were all members of the project team. The lowest averaging scores were from non-project team members.

11.2.3 Questionnaire Results by Theme

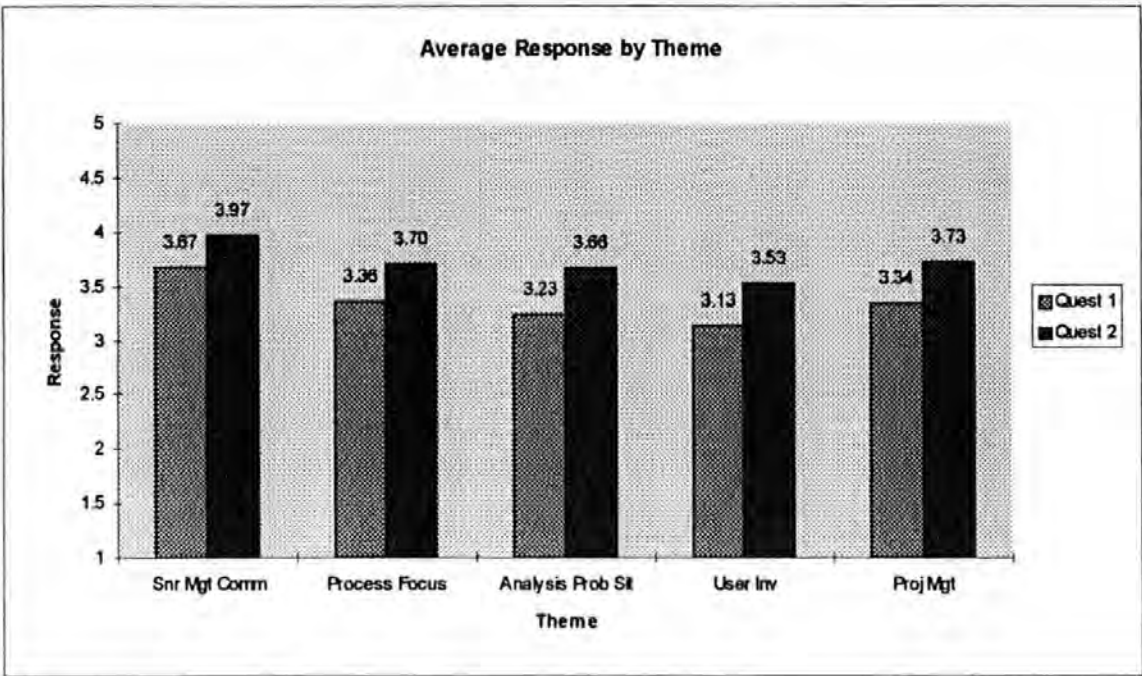


Figure 24: Average Response by Theme Compared

The means for each theme ranged from 3.53 to 3.97. Each theme's average was consistently higher in questionnaire 2. The highest scoring theme was senior management commitment and the lowest scoring theme was user involvement. This was the same as questionnaire 1.

11.3 T-test Analysis

A t-test was calculated for each theme to analyse whether any improvement in the scores between questionnaires 1 and 2 was statistically significant. The t-test assessed the difference in the means of the two questionnaires.

The t-test was a useful analysis as it is appropriate for small samples of less than 30 (Chisnall 1992). A paired two tailed t-test was performed for the questionnaires. A paired test examines the probability that the changes in each individual's scores could have happened by chance. It is more powerful than a non-paired test since the results for each individual before and after are compared rather than the sample mean as a whole. The

paired test is appropriate as two sets of results that have come from the same sample are being compared.

A paired t-test indicates when two samples means are distinct. The null hypothesis (H_0) is that the results from the first and second questionnaire are statistically the same. Table 8 shows that for each theme the probability of the results being statistically the same is considerably less than 1%. The null hypothesis is rejected.

Theme	Probability
Senior Management Commitment	0.000064
Process Based Change	0.0000037
Analysis of Problem Situation	0.00003
User Involvement	0.00000022
Project Management	0.0000044

Table 8: Results of t-test

It can be concluded from this test that the improvements in the questionnaire results from questionnaire 1 to 2 are statistically significant.

11.3.1 Senior Management Commitment

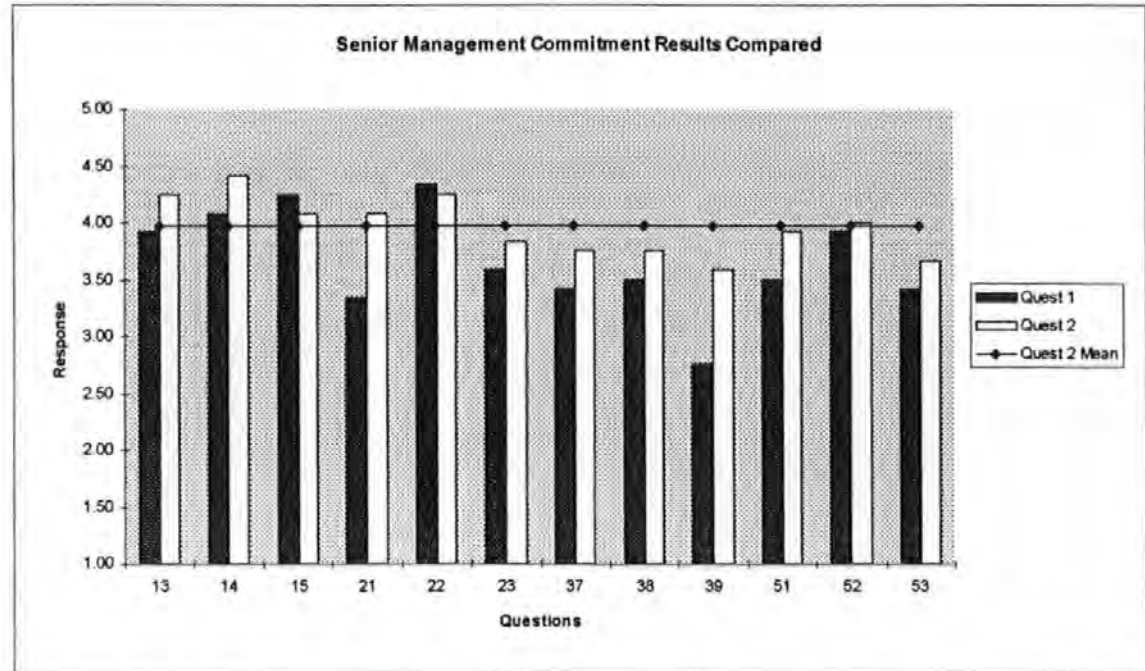


Figure 25: Results of Senior Management Commitment Theme Compared

Results

This theme had the highest overall average score. The theme mean increased from 3.67 to 3.97 from questionnaire 1 to 2. This was statistically significant (see the t-test discussion above). The questions that scored above the mean (13, 14, 15, 21, 22 and 52) were concerned with whether the sponsor ‘...demonstrated commitment to making the process change happen’, if ‘The sponsor was effectively leading the process change’, ‘... believes there is a real need for the change’ and whether ‘The sponsor understands the process change’. As with the first questionnaire the lowest scoring questions were concerned with how well the change agent was leading the change. Question 37, *A change agent (e.g. project manager, facilitator, team leader) is leading the change*) had the largest standard deviation 1.00).

Analysis

The improvement in the theme mean was thought to have been caused by the increased demonstration of senior management commitment. Since the first questionnaire had been administered the project had been included in the management team project portfolio and

the management had ensured the provision of information systems developers time to the project. The management commitment was also proven when commitment was maintained through several management structure changes.

The lower mean for the change agent questions were thought to be caused by the role of the agent being more of a facilitator than a leader or catalyst of change. There was also confusion about the definition of a change agent and who the project change agent was. Overall the improvement in the mean was perceived as being good by the team.

11.3.2 User Involvement

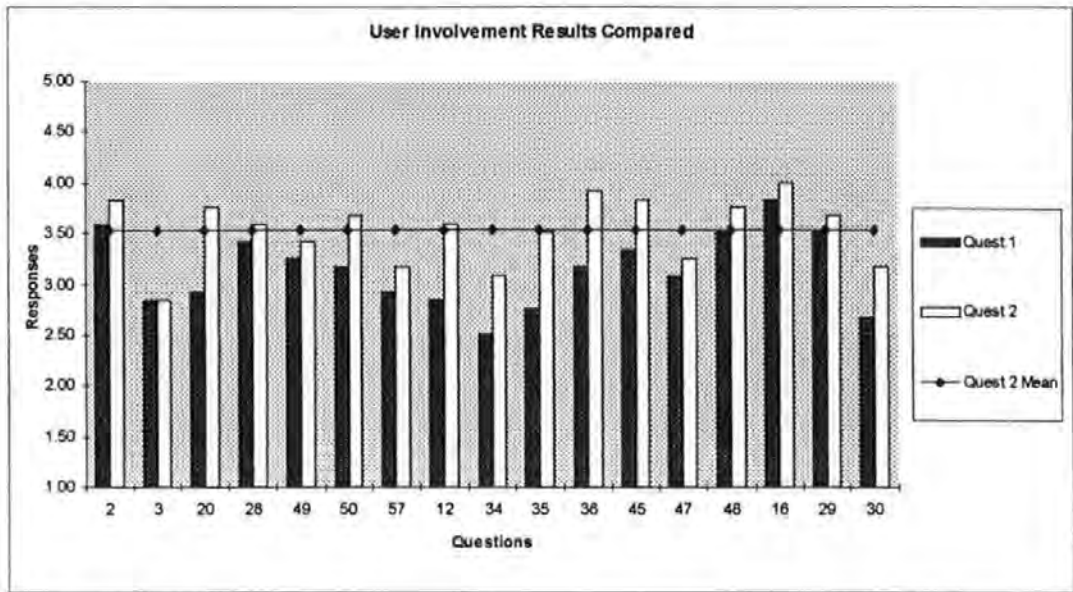


Figure 26: Results of the User Involvement Compared

Results

User involvement had the lowest theme mean in questionnaire 2. The average response for the theme increased from 3.15 in questionnaire 1 to 3.53 in questionnaire 2. The t-test confirmed that the improvement was statistically significant. Questions 2, 3, 20, 28, 49, 50 and 57 were specifically about user involvement in the change. Questions 12, 34, 35, 36, 45, 47 and 48 were concerned with communication aspects of user involvement and questions 16, 29 and 30 were concerned with teamworking aspects of user involvement.

The responses to 6 out of 7 of the specific user involvement questions had improved. The average response to question 3 remained unchanged and well below average. This question asked if *'Some people were not convinced that this process change was necessary'*. This question also had the highest standard deviation (1.19). Questions 49 and 57 were also below average. These questions were *'The financial resources needed to implement this process change are available'* and if *'The impact of this process change on the end users' daily work patterns has been adequately considered'*. The questions with higher than average results were about *'Project members feel ownership of the process*

change' and whether *'Input has been solicited from the end users throughout this project'*.

The average response to the communication questions improved considerably. The questions with a higher than average score were concerned with internal communications within the project team; such as *'Communications to all those immediately affected by the process change have been planned'* and *'Communication between those directly involved in the project is effective'*. The lower scoring questions were concerned with the quality of communication externally to PSS; whether *'Sufficient information about this project is being communicated in PSS'* (this question also had the highest standard deviation of the theme at; 1.08) and if this information *'gives a clear and consistent message'*.

Question 16 and 29 had higher means than the overall average. These two questions were *'The project lends itself to an individual effort rather than a team-based approach'* and *'Project work group members understand their roles in the process change project'*.

Question 30 (*'those working on the project work as a team'*) fell below the mean and also had the highest standard deviation of 1.08.

Analysis

The team felt the user involvement had been successfully improved since the first questionnaire for several reasons. The new process and supporting information systems had been demonstrated to the department and systems education and training had begun. In addition, the product planners were following the new process. The team were unsure why there should be a large range of opinion about whether the people were convinced the process change was necessary.

The average response to the communication questions had improved. Several communications had taken place since the first questionnaire, an article had been published in the PSS magazine and several presentations to the management board and the product

planners had taken place. The team agreed that communication beyond the core team were still not very effective. Typically, the wider project team were informed of project progress using the meeting minutes. It was felt that the minutes were an inappropriate method of communication and a report summarising the meeting would have been more useful. Much of the communication had been planned but not actually completed at the time of administering the questionnaire. The project team would have known about these plans but other respondents may not. This may account for the large range of opinion about whether sufficient communication had taken place or not.

The teamworking had not improved greatly. One possible reason the project team cited for this was that the extended team contributed very little to the project and the core team felt this lack of contribution. There was occasionally a difference of opinions between the core and extended team. The relationship between the core and extended team needed to be very carefully managed.

11.3.3 Analysis of the Problem Situation

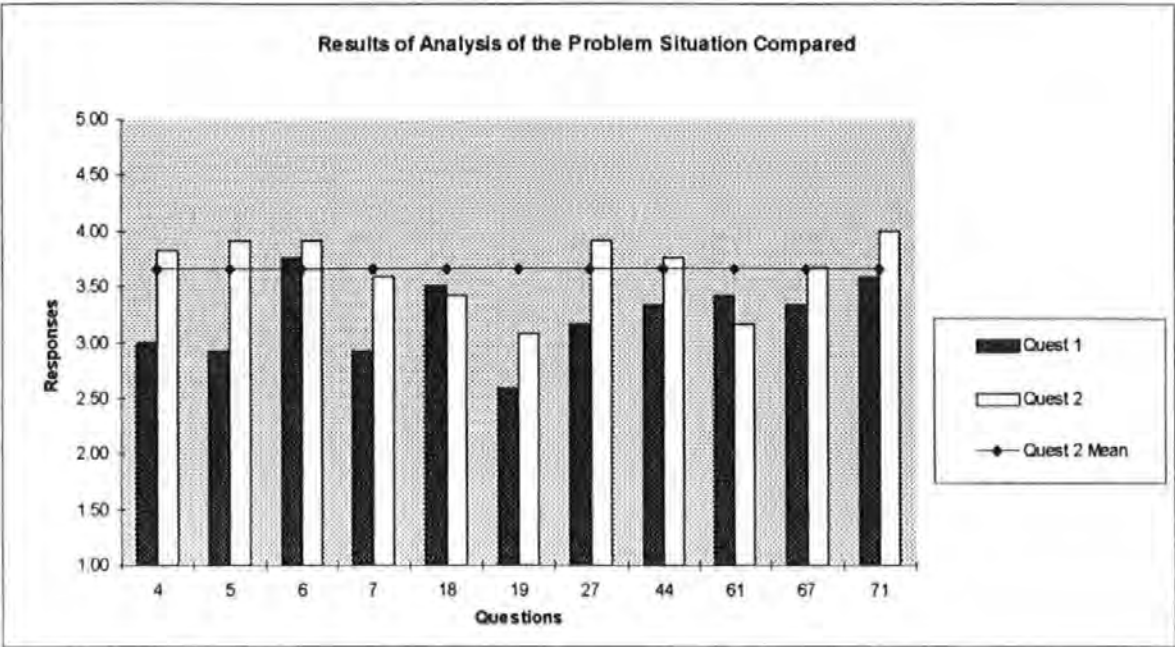


Figure 27: Results of Analysis of the Problem Situation Compared

Results

The overall mean of the theme increased from 3.23 to 3.7. As with the other themes the t-test confirmed the improvement in this theme was statistically significant. This theme had the second lowest scoring theme mean. Questions 4, 5 and 6 were above the mean. These questions examined whether *'Different and alternative perspectives of the problem have been considered'*, *'Alternative approaches to solving the problem have been considered'* and *'The real problem is being addressed, and not just a symptom of a more complex problem'*. Other high scoring questions were about where the project fitted into other changes. Question 27 (*'It is not clear where this project fits into other projects occurring in PSS'*) had a higher than average score and had the highest standard deviation of 1.23. The lower scoring questions were concerned with whether those *'directly'* and *'indirectly affected by the project had been identified'* and *'The effect this process change will have on other projects has been considered'*.

Analysis

The team thought the improvement in the original scores for this theme might have been caused by an increase in understanding about the initial problem investigation. The implementation focus group was the first meeting held about this problem. Much problem investigation and exploration occurred in this meeting. Only two members of the project team contributed to this meeting. It was felt there was a lack of communication about the focus group outputs. It was not until the project progressed that people began to understand the type of problem analysis and investigation that had been done.

11.3.4 Process Focus

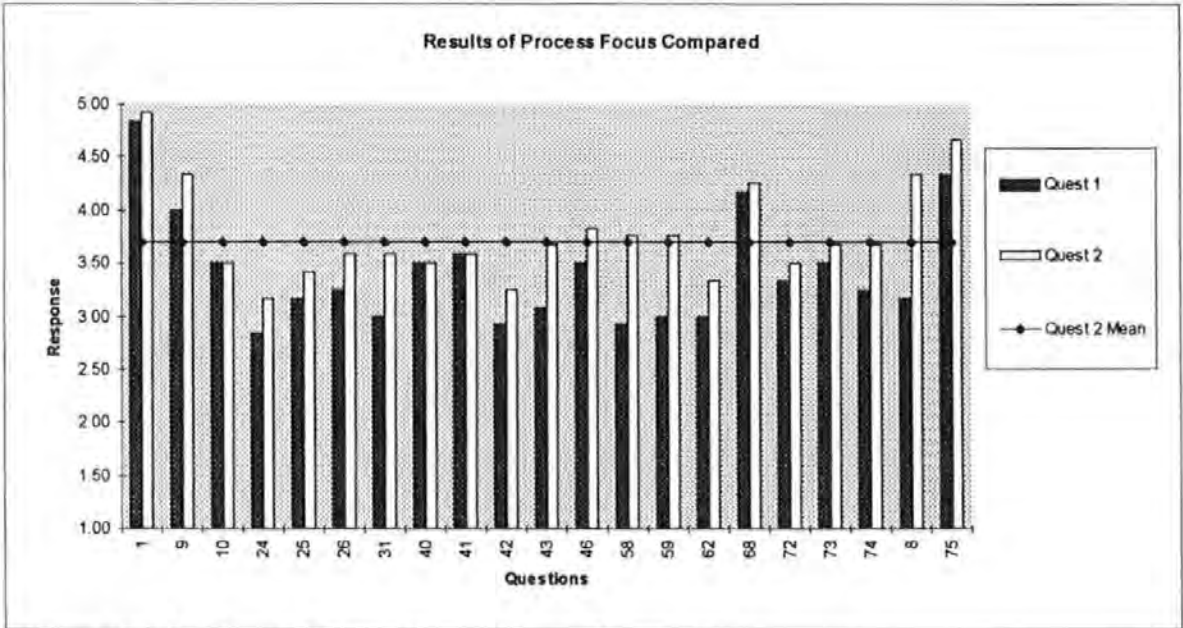


Figure 28: Results of Process Focus Theme Compared

Results

This theme had the second highest theme mean. The theme mean had increased significantly from 3.36 to 3.7. Questions that scored above the theme mean concerned whether *'the process change is really needed'* (Question 1), whether *'the process owner has been identified'* (Question 9), if *'the education and training required to use the process change will be provided'*, (Question 46) and *'Measures of how well the process is performing are being established e.g. end-to-end process cycle time'* (Question 59). Questions below the mean included; the process change is compatible with existing

processes and other planned process changes, inputs, outputs and process boundaries have been identified and the IT and IS support will be provided. Questions 10 and 72, (*'The process owner has end-to-end responsibility for the new process'* and *'There is no provision for the IT and IS requirements that will be needed to support the process change'*) had the larger standard deviations; 1.16 and 1.15 respectively.

Analysis

The process questions with the lower than average scores dealt with detailed aspects about the process. It was a natural reaction for those who do not know the process in detail to tend towards a more neutral response. On the other hand, questions with the higher means are those that are more generally understood and more widely communicated, such as whether education and training will be provided.

The question of who was the end-to-end process owner was debated throughout the project. This may have led to the large standard deviation for question 10. An owner was not chosen until December.

The process focus scores would have improved overall as many of the product planners had begun to use the process. This meant their understanding of the process had improved as the project progressed which helped the scores to improve.

11.3.5 Project Planning and Management

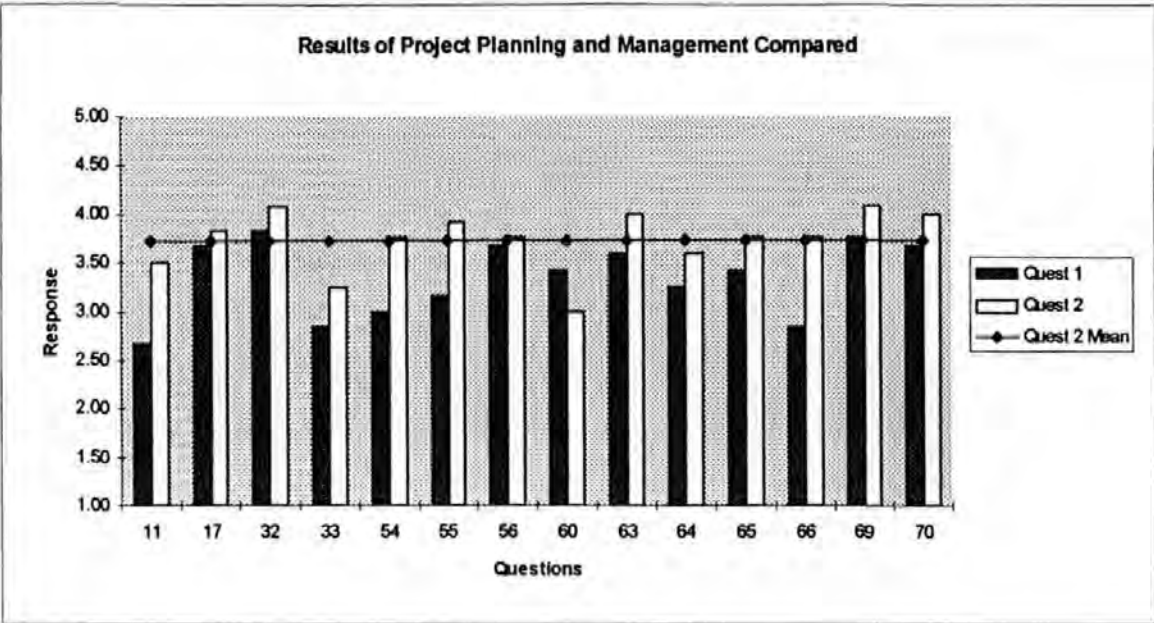


Figure 29: Results of the Project Planning and Management Theme Compared

Results

The overall mean for this theme increased from 3.34 to 3.73. This was the third highest scoring theme. Questions 54, 55 and 56 were all above the theme mean. They were concerned with whether *'The project has been planned through to completion'*, *'The project timescales are realistic'* and *'The project plan is achievable e.g. sufficient human resource, IT, finance etc.'* Other questions that had average scores above the theme mean were concerned with the project management documentation, the project managers and project teams effectiveness. The lower scoring questions were about writing a business case, assessing the risks and dependencies of the project. The scores for Question 60 (*'Project work group members are reliable about carrying out duties and responsibilities assigned to them'*), had worsened since the first questionnaire. Question 66 (*'The original aims and objectives of the project are reviewed and revised periodically'*) had the highest standard deviation of 1.31.

Analysis

As the project progressed the respondents became more familiar with the project management that was being used to plan and monitor the project. This may have helped in improving the average scores from questionnaire 1 to 2. The team felt that the scores could have been improved with closer management, including reminders of actions to be taken. The high deviation for question 66 indicated that the aims and objectives of the project were still not being reviewed regularly.

11.4 Project Completion

At the end of January 1999 the project had reached closedown stage. The information systems had been tested by the planners and business account managers. Education about the new process and training on the supporting information systems was provided in early December 1998. The product planners were educated and trained first. Education and training to other professionals was provided as and when it was required. In November 1998 the new information system was switched on.

The review process had been analysed, designed and implemented. The process facilitated the capture of the call reporting and inventory data. This enabled actual data to be compared to planned, estimated data, so that any deviation could be adjusted. The review process project put the 'pipework' in place to absorb call reporting and inventory data as soon as it became available. The 'pipework' that was enabling the capture of the data was provided by the two supporting information systems.

By January 1999 the process was in use; it had been completely and successfully implemented. Additional support of the successful implementation is illustrated by the improvement in overall user satisfaction (figure 26).

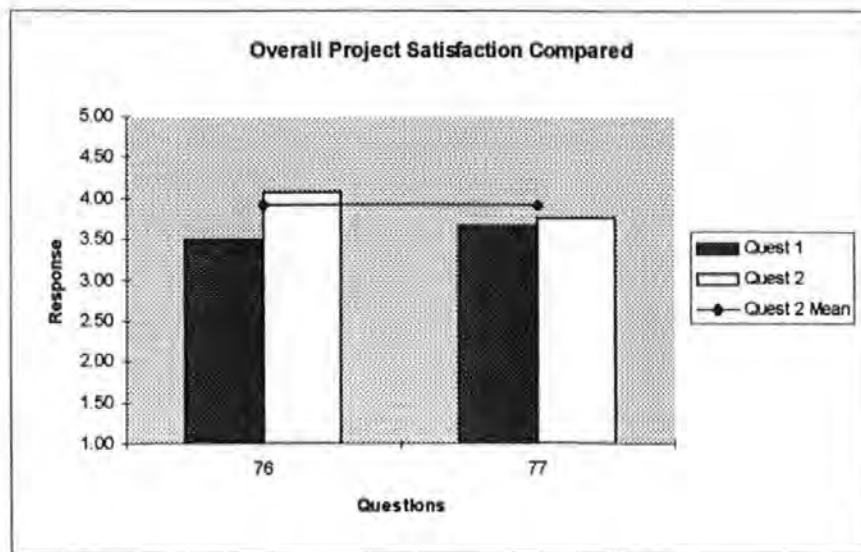


Figure 30: Results of Overall Project Satisfaction Compared

The questions average increased from 3.58 to 3.93 from questionnaire 1 to 2. As mentioned in the previous chapter user satisfaction may be used as a measure of implementation success.

11.5 Analysis

This fourth process-based change action research project was completely and successfully implemented. This implementation was managed using the implementation framework. Specific aspects of the framework that helped the successful implementation of this process-based change are explored below.

In line with the Implementation Framework there was senior management commitment to the project. This commitment was demonstrated by inclusion of the project in the management team project portfolio and provision of information systems developers to the project. The management commitment was also proved when commitment was maintained through several management structure changes.

The senior management commitment to the project was not extremely active. However, this did not affect project progress as it was never doubted that commitment would have

been demonstrated if required. In addition, the project team noted that they always felt that senior management were behind the project.

“The sponsorship of the project was excellent”. The same manager remained as sponsor throughout the project. The project team members felt this gave the project stability throughout the year. The sponsor took a very active and supportive role, attending all team meetings. It is unusual for the sponsor to attend working meetings, however the team felt, *“his attendance ensured the project happened”*. In addition it meant the business needs and requirements were understood and the team *“kept the ball rolling and the focus maintained”*. Overall the team members felt that without the sponsor’s leadership the project probably would not have succeeded.

The problem was explored initially in the Implementation Focus Group. The sponsor said the planners took a very logical approach. They were clear about what they wanted and they did the right amount of analysis to define the problem and a practical method to solve the problem. The problem analysis meant that the need for an information system was realised at the outset of the project. This meant the development time required was booked and organised in advance. Had this requirement not been realised, development time would not have been available and it would not have been possible to complete the project.

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The immediate users of the review process, the product planners, were very involved in the project. Other planners who were not on the team were regularly updated and involved in the analysis, design and implementation of the process, for example ten product planners tested the information systems. This led to a feeling of ownership and commitment to the project. In addition, it meant that a process that was exactly what the planners required was designed and developed.

The sponsor commented that the *"project team worked very well. All the right people were willing to help. They were not forced to join the team"*. The team was kept small and focused; the original team of eight was reduced to a core of five. This meant that people's time and resources were used well. The sponsor also noted that the characters in the team worked well together; *"When a member of the main team attended a team meeting it gave the project a different point of view, which worked very well"*. The team were sufficiently motivated and did not have to be forced to work as they could see the benefit that the process would bring in the future.

Generally it was felt that the teamworking of the core team was very good. Indeed, a team member noted that the teamworking was a *"major reason for the results so far"*. At the same time it was felt that members of the extended team members should have contributed and been involved more.

Other employees who were indirectly affected by the change were involved in the project (Business Area Managers (BAMs) and engineers). Involvement was usually through presentations, workshops and communications via articles in the corporate magazine. Publicising the process change and ensuring the users affected knew about the project played a very important role in developing commitment to the project.

The Implementation Framework ensured that a process focus was taken so that the process was thoroughly analysed. Inputs (inventory and call reporting) and outputs (detailed planning information) and customers and suppliers were investigated, understood and accounted for. This meant a practical process was designed that the planners started to follow immediately even before the information systems had been designed. The process was designed and tested by planners. This meant that the implemented process was extremely relevant and appropriate to the planners' needs.

Applying the Implementation Framework ensured that project progress was managed using project management disciplines. A project manager was assigned, project plan developed, project goals, objectives, boundary, risks and dependencies defined and regular team meetings held. This meant the project was kept to time as planned.

No business case was written for the project. The sponsor said that the *“clear direction and management commitment”* to the project and the fact that management wanted the project to be done meant the need for a business case was not great. The sponsor said *“sometimes writing a business case is a waste of time, as it just gathers dust”*. The sponsor also noted that the project was an *“in-house project, so it wasn’t costing IBM any extra money”*. The sponsor and team did not feel there was a need for a business case.

A project plan was developed for the complete project. It evolved and developed as the project progressed. The plan was practical and allowed the project to be monitored as one team member described the project *“was not planned to death”*. This was perhaps as the team were confident that they could achieve the end result and knew what this result was.

The Implementation Audit Questionnaire aspect of the framework significantly affected the project work. Actions were taken by the project team to rectify weaknesses in the project that had been identified by questionnaire 1. Each theme of the implementation framework was improved on through project work initiated as a result of the questionnaire. In support of this conclusion the t-test for each theme that the improvement in the questionnaire results is statistically significant (table 8). The measure of questionnaire validity; Cronbach’s alpha also improved between questionnaires.

The project management element of the Implementation Framework improved significantly as a result of the questionnaire. The benefits of completing the project were discussed and written into the project definition document and a regular review of the *'original aims and objectives'* of the project was introduced. These improvements are reflected by the low t-test scores for questions 11 (*'A business case has been identified for this project'*) and 66 (*'The original aims and objectives of the project are not reviewed and revised periodically'*), of 0.017 and 0.026 respectively.

The user involvement in implementation was improved by taking several actions; for example, the questionnaire indicated that there was not as much communication about the project externally to PSS as there could have been. The project team took several actions; presentations about the project were given in management team meetings and engineer team meetings and an article was published in the company magazine. As a result communications improved, this was reflected in the t-test results from questions such as; *'information being communicated gives a clear and consistent message'*. The t-test result (0.032) meant that the improvement in the scores were statistically significant. The internal communication within the project team also improved; for example question 36 *'communication between those directly involved in the project is effective'* t-test score (0.043) indicated the change was statistically significant.

User involvement in the project was also improved through taking actions concerning the teamworking. The questionnaire indicated that the teamworking was not as good as it could have been; for example before the questionnaire was run the process design had been carried out by two team members. As a consequence members of the wider team were included in team meetings and additional members of the project team were involved in the process design. These improvements are reflected in the t-test scores for questions such as 31; *'a team is designing the process'* (t-test = 0.046).

Little additional work had to be done to improve the senior management commitment aspect of the framework as this was the highest scoring theme. However, the questionnaire did highlight an issue of not knowing who the change agent was and if he/she were effectively leading the change. This issue was resolved when the project team identified the sponsor as being the change agent. This was reflected in the t-test score for questions such as 39; *'the change agent is effectively managing the change'* (t-test = 0.044).

The problem situation theme had one of the lower scoring theme means. One cause of this low score was attributed to using a focus group to define the problem. Not all of the project team members were involved in the initial discussions and decisions made about the problem. This led to some team members feeling uninvolved in initial decisions and even uncommitted to the project at first. The results from questionnaire 1 indicated that respondents had the perception that the problem situation had not been analysed fully (figure 20). An interviewee said that this was because the outputs of the focus group were not shared widely enough. As a consequence of the questionnaire results a discussion about the initial problem identification carried out in the Implementation Focus Group was carried out in the June team meeting. The improvement in Questions 4 and 5 *'different and alternative perspectives of the problem have been considered'* and *'alternative perspectives of the problem have been considered'* reflects the increase in information exchange. T-test scores for these questions were 0.005 and 0.006 respectively indicating that there was a significant improvement.

Aspects of the focus on process were improved; for example, as a consequence of the questionnaire it was realised that the process performance measures had not been identified. Appropriate process measures were identified and put in place to rectify this weakness. This improvement was reflected in questions such as 59 (*'measures of how well*

the process is performing are being established e.g. end-to-end process cycle time') where opinion was proved to have improved significantly in the t-test result of 0.056.

11.6 Conclusions

To validate the Implementation Framework it was applied to a fourth action research project. The purpose of the validation was to test whether the framework effectively managed an implementation project from project set-up through to complete successful implementation.

The project was successfully established using the Implementation Focus Group and the Implementation Audit Questionnaire. Actions were taken as a consequence of the results of questionnaire 1 where weaknesses in the project were revealed. The need for these improvements would not have been noticed had the questionnaire not been run. The project management, teamworking, communications, user involvement, senior management commitment, focus on process and information exchange about the problem analysis were all improved. The framework led to greater awareness of the factors affecting implementation and improved implementation of these factors. Information systems were developed and the process implemented.

In contrast with the three action research projects described earlier in this thesis and in contrast to implementation projects reported in the literature (as discussed in Chapter 2 and 3) this process-based change was completely and successfully implemented. Action research projects 1, 2 and 3 were not completely implemented, the users did not use the process, the benefits the process was predicted it would produce were not generated and the objectives of the project were not satisfied.

In the fourth action research project, the process-based change was successfully

implemented; for example the project goal (*'to provide the business with an accurate, constantly reviewed and up to date set of planned costs, so that profitable contract processing is ensured into the future'*) was met. In addition the benefits the process was planned to produce began to happen; for example process improvements occurred; such as decrease in the time to review product sets from a week to 2 days and product performance reviews being held two weeks earlier in the month. Other benefits of the process implementation included provision of data unavailable before at a level of detail that had not been possible previously. Most importantly the users were using the process. Indeed, a team member stated that their role was now *'living and breathing the review process'*.

The framework was successfully verified. Application of the framework caused increased awareness of the factors that affect implementation and even caused improvement in the attention paid to the themes. The framework also ensured that the project was managed throughout. The attention paid to the themes of the framework improved between questionnaires as proved by the t-test results for each theme. The main additional variable in the project, not present in the other action research projects was the application of the implementation framework. Thus, it is possible to say that the Implementation Framework did help to improve the implementation of process-based change.

Chapter 12

Conclusions

12.1 Summary of Results

This research has proposed a framework for improving the management of implementation of process-based change projects.

The purpose of the research was to understand and then improve the problems of implementation of process-based change projects. There is much evidence, both theoretical and empirical, to suggest that there is a high percentage of implementation failures (as discussed in Chapter 2 and 3). Thus, the purpose of this research was to understand how process-based change projects were implemented and what was affecting this implementation. The researcher took part in three action research projects in IBM PSS (as explained in chapters 5, 6 and 7) in order to develop an understanding of implementation.

12.1.1 Action Research Project Results

The data generated from the empirical research (Chapters 2 and 3) found that no matter whether the project was complex or simple, in terms of number of people or extent of change implementation still failed. Many factors were found to affect implementation. It was not possible from this study to attribute unsuccessful implementation to one factor or to say that one factor was more inhibiting than another. It was not that one project was more organisationally complex than another or one project was larger than another or that it affected or involved more users than another that was leading to implementation failure. In the initial 3 implementations no matter what factors were encouraging or inhibiting implementation or what characteristics a project possessed implementation appeared to

fail.

12.1.2 Data Validation

The data that was gathered from the action research projects was validated by method and data triangulation; focus groups and semi-structured interviews were used. This data was then analysed using the 'grounded theory' approach of theory generating. The dominant factors that affected implementation arose from a synthesis of the literature reviewed and empirical data findings from the action research projects.

12.1.3 Implementation Framework Development

The dominant themes that evolved from the data analysis formed the basis of the implementation framework. The five themes crucial for successful implementation were senior management commitment, analysis of the problem situation, user involvement, process focus and project planning and management. The data analysis appeared to show that it was more likely that the problem of unsuccessful implementation was complex, with a systemic property that may only begin to be improved when all the themes are addressed together. This idea is discussed in Chapter 8. The implementation framework was intended to address this idea.

The purpose of the framework was to ensure that each theme could be monitored and audited throughout the project. Two tools were developed to support the framework. These were an Implementation Focus Group and an Implementation Audit Questionnaire. It was also recommended that the framework and its tools should be used in conjunction with a formal project management system.

12.1.4 Validation of the Implementation Framework

The framework was tested on a fourth action research project in the product planning area of PSS. The project ran from January 1998 to January 1999. The researcher took control of this project as full-time project manager.

The process change was completely and successfully implemented. The change in process led to a complete change in working practices and in particular, in the role of the product planner.

Several process improvements were gained as a consequence of the implementation. The product review cycle time was reduced from one week to two days. Product reviewing was also possible two weeks earlier than previously. Other benefits of the process implementation included process analysis at a greater level of detail (this was explained in Chapter 9) and more accurate data.

The focus group was run at the outset of the project, so that the themes of the framework were understood within the context of the particular problem situation being investigated. A project management system was established once senior management commitment and sponsorship to the project had been achieved. To monitor and audit the themes throughout the project the implementation questionnaire was administered twice (month 4 and month 10 of the project).

Applying the framework ensured that the five themes were monitored and considered throughout the project. Indeed, the results from the questionnaire indicated that the attention paid to the themes had improved in the six months between administering the first and second questionnaire. This improvement was calculated to be a statistically significant

increase. This showed the value of the framework in the management as well as in the establishment of the implementation project.

In contrast to the original three action research projects, this process-based change project was successfully and completely implemented. The project was completed on time and to budget; the process and supporting information systems were completely implemented and the process was producing the benefits it set out to achieve.

The variable in the fourth action research project that was not present in the other action research projects was the application of the implementation framework. Thus, it is likely that the implementation framework helped improve the process of implementation and ultimately led to a more successful process-based change project implementation.

12.2 Reflections on the Implementation Literature Review

IS Implementation is a relatively new subject of research. The majority of implementation literature used in this research is from 1970's and 1980's work. The amount of literature generated on IS implementation in the 90's appears to have decreased; research becomes more focused upon Business Process Re-engineering.

This research has attempted to stay focused on the Information Systems implementation literature and where possible process-based implementation literature. Maintaining this focus was difficult as implementation literature is found in many domains; Management Science/Operations Research, information technology, management information systems. On one hand the large amount of data available made it difficult to distinguish the relevant information from the irrelevant. On the other hand this also provided a rich field of information for research.

To throw additional light on the research questions a wider study could have looked at literature from other areas such as organisational culture, political dimensions, project management or organisational development.

Organisational culture has been noted as a factor that could have affected implementation. Revenaugh (1994), in his examination of the level of effort required to implement a process change states that 'corporate culture is a key variable in implementing any major business change'. Similarly Bettman (1993) discusses the idea that the implementation of a change needs to be accompanied by an appropriate change in culture for implementation to be successful. Deeper investigation into this literature could help broaden the understanding of implementation and the factors that can influence the success of implementation. Organisational culture writers that would be important to consider

include, Schein (1984), Kotter & Heskett (1992), Hofstede (1994), Hofstede et al (1990), Bate (1994) and Smircich (1983). Recent authors on the implementation of organisational culture to consider would include, Avison and Myers (1995), Cooper (1994), Emery et al (1996), Pliskin et al (1993) and Westbrook et al (1995).

‘The importance of power and political action has also received significant attention in the information systems literature’ (Walsham, 1993). Indeed Keen (1981) describes information systems development as ‘an intensely political as well as technical process’. In addition Kwon and Zmud (1987) define the political research stream as understanding how stakeholders with vested interests can influence the direction of implementation efforts. The principal finding from this stream of research was that ‘many seemingly irrational or inconsistent implementation behaviours and outcomes can be understood when all of the consequences of IS implementations on all stakeholders are considered’. If the conclusions drawn by Kwon and Zmud are correct it is possible investigation of the political literature by authors such as the ones noted above may help understand implementation from a political perspective.

The topic of implementation could also be investigated from a project management perspective (see section 2.2.2). The use of project management techniques to implement projects is common. Project management is becoming a popular approach used by organisations to achieving organisational change. The work of Lock (1996), Partington (1996), Gilbreath (1986), Morris (1988), Cleland and King (1988), Buchanan and Boddy (1992) and Bernstein (1983) could help to shed some additional light on the research questions posed in this area.

An additional collection of literature touched on in section 3.1.1 that may have helped to understand the research questions from another perspective is early organisational

development literature. It is important to understand this literature as the original implementation literature is founded on this work. For example the early implementation models of Lucas (1981) and Ginzberg (1979) are based on Lewin's (1951) model of change. Early authors on organisational development that would be important to understand include Taylor (1967), Weber (1947), Lewin (1951), Argyris (1957, 1964), McGregor (1960), Likert (1967), Leavitt (1964) Emery & Trist (1965) and Trist & Bamforth (1951). More recent authors on such as, Kanter (1983), Peters and Waterman (1982), Senge et al (1990), Burke & Litwin (1992) and Tranfield (1990) may be helpful in providing an organisational change and organisational development perspective of implementation problems.

Early implementation models could help understand the factors affecting implementation and could help in the development of a better way to manage implementation. These models include participative systems design and socio-technical systems approach. Participative systems design (see section 2.2.4) is considered an important concept, as 'user involvement in the development of information systems has been claimed to be the key to successful system implementation' (Ives and Olsen, 1981). Thus, deeper investigation into the participative systems design work of Mumford & Weir (1979), Mumford (1983), Mumford & Beekman (1994), Hirschheim (1983), Ives and Olsen (1981) and Wong & Tate (1994) could enhance the understanding of how to improve implementation.

Socio-technical systems is an additional approach which may be used to implement operational improvements. The socio-technical approach originated from the work of authors such as Emery & Trist (1973) and Trist (1971). The socio-technical approach is based on systems thinking and was developed using action research. The socio-technical approach is a concept that considers both the people and technical resources in a project

and how they interact. As these areas are all concerns of this research taking a socio-technical perspective may be particularly useful in shedding additional light onto both the research questions. Other work of Taylor (1990), Cherns (1976, 1987) and Trist (1981) may also be helpful.

Recent discussions in Information Systems may also help understand implementation. One collection of relevant helpful Information Systems literature is Human-Computer Interaction (HCI). HCI's goal is to 'facilitate the design, implementation and communications systems that satisfy the needs of those who own and use them' (Buckingham, 1999). The HCI work of authors such as Clegg (1994), Frese (1987), Gaines and Shaw (1986) and Suchman (1987) is complementary to the implementation literature already investigated as similar problems have been noted in both fields. Recent work on the direction of Information Systems and the disciplines that provide the foundations for Information Systems may also add to the understanding of implementation. Useful articles include Myers (1994, 1997), Gosain et al (1997) and Avison and Myers (1995).

Whilst it is recognised that these other perspectives can influence the outcome of implementation, the primary aim of this research is to create a framework useful to improve the management of implementation. It was not within the boundary of this research to create an approach to manage a change from these other perspectives. However it is possible that further investigation into alternative perspectives and how they affect implementation may enhance the Implementation Framework.

Using the wider view of implementation or similarly taking implementation to be synonymous to a process of change was beneficial. This widened the boundary of research; any factor that affected change could be investigated no matter when or where it

occurred in the process change project. To investigate factors that affect implementation across the life-cycle was an important part of the research. An 'holistic approach' to analysing the factors could be taken, which appears to be an 'important gap in the existing body of knowledge' (McGolpin & Ward, 1997).

Although there is no de-facto definition of the wider view of implementation the majority of the definitions refer to similar characteristics, such as that implementation begins when the idea for the change is conceived and the implementation is complete when the benefits that were predicted from the change are being produced and users are using the system.

Successful implementation is a difficult concept to measure as the typical units of measurements are qualitative rather than quantitative; such as user satisfaction, meeting objectives. The success of the projects was also difficult to measure as, typically IBM internal projects do not have the benefits which projects are likely to produce identified. Thus, 'user satisfaction' was used as an additional measure of success. User satisfaction with the project was measured in the Implementation Audit Questionnaire. Ginzberg (1979) suggests that user satisfaction with a project can be used to indicate likely implementation success. Implementation success was also measured by assessing whether the project had met its objectives and produced the benefits it was designed to achieve.

Factor research looks at the factors affecting implementation. Much of the factor research reviewed was based on reviews of past empirical and non empirical studies; for example, Meredith (1981), Lyytinen & Hirschheim (1987) Lucas (1981) and McGolpin & Ward (1997). Land et al (1989) based their factor research on empirical evidence gathered via interviews in four host companies. The researcher has not found any factor research that is based on in-depth, longitudinal action research in one company. This was the focus of this research.

Authors such as Swanson (1988) suggest that investigating the relationships and dependencies between the factors would help develop a solution to improve implementation. This research has not focused on investigating these relationships. The view taken in this research was that unsuccessful implementation is complex and may only begin to be improved when all the themes are addressed together as a whole. There was no evidence in the implementation literature review that one factor was more inhibiting than another or that the dependency between any one factor and another was more important than other relationships.

Most of the implementation projects reviewed in the literature had been developed from previous empirical and non-empirical studies; for example Kwon & Zmud (1987), Lucas (1981), Schultz and Ginzberg (1984) and Lucas et al (1990). Ginzberg (1979) based his research into the process of implementation on his own empirical studies. His research involved questionnaire research in 11 organisations. This research has not found any implementation process research that has evolved from and been founded upon empirical in-depth, longitudinal research in one company.

Completing research into implementation theory, factors and processes brought together the research. Combining these areas of research was useful as both the factors that affect implementation and an implementation process must be considered in planning for implementation (Lucas 1981).

The literature seemed not to give much help or provide solutions from research that was based on long-run, in-depth implementation factor research. In addition the literature appeared to be insufficient in research that was founded in both academic and industrial work. Thus, this researched focused on doing more work in these areas as discussed in

12.3 Reflections upon the Research Question

The specific area of implementation that the researcher sought to address was defined by two research questions. The first research question was;

What are the factors that affect the implementation of process-based change projects?

Focusing research into the area of factors that affect implementation was useful, as little long-term, in-depth action research based investigations into this area had been found. It was obvious from the first three process-based change projects that implementation was not completely successful. The focus of the first research question allowed investigation into possible factors that may be causing the implementation problems.

One of the key concerns of this research is that it should provide a solution to the implementation problems currently being faced by managers in industry. The second research question focused the research into this direction:

How can we develop an improved process for implementing process-based change projects?

The question was helpful as it ensured the researcher developed an implementation framework. Developing the framework meant that the findings from the research were presented in a practical, useable format. The results and findings from the research could be more easily exploited, as the framework could easily be used by other practitioners.

The research questions were very useful in planning the direction of the research over time. The questions also meant that the research took a very practical, industry focused direction.

12.4 Reflections on the Research Method

Action research was a very useful method for addressing the research questions. By becoming a full time Business Improvement Team (BIT) member and becoming actively involved on projects the researcher was able to build up an in-depth understanding of the factors that were affecting implementation.

As suggested by several authors (Lyytinen & Hirschheim 1987, Gill & Johnson 1997, Meredith et al 1989), action research was found to be applicable to solving the practical problems faced by managers in organisations today. The continuous involvement in change that action research demanded was fundamental in ensuring the area under investigation remained industrially relevant throughout the research.

By being a full time BIT member the researcher established trusting working relationships with other employees. As a consequence it was possible to gather deep, rich findings from colleagues; for example, typically contributors would share their thoughts, feelings, perceptions and opinions on what was being researched. It would have been difficult to collect these types of findings without being completely trusted by these individuals. In addition, it would have been difficult to understand this type of data without being immersed within the context of the change.

The limitations of action research are well reported and have been discussed in Chapter 4. To ensure the validity of this research, the twelve contentions of Eden and Huxham (1996) have been considered throughout.

The issues faced when addressing each of these contentions, the advantages of using the Eden and Huxham framework and some of the ways that the research could have been done differently on reflection, are set out below:

Contention 1

'Action research must have some implications beyond those required for action or generation of knowledge in the domain of the project'. 'It must be clear that the results could inform other contexts, at least in the sense of suggesting areas for consideration'.

Reflections

The framework has not been tested in other company contexts; it was tested on a fourth process-based change project in the host organisation. As discussed in the introductory chapter the process change projects were diverse; for example the number of users affected, the cost, the extent of the process change and the number of employees involved all differed. The framework has been tested on a fourth process-based change project, that possesses different characteristics from the previous three projects. However, it is recommended that future research (section 12.6) should include testing of the framework in different organisational contexts; such as, in a different industry.

Contention 2

'As well as being usable in everyday life action research demands an explicit concern with theory. This theory will be formed from the characterisation or conceptualisation of the particular experience in ways which are intended to be meaningful to others'.

Reflections

Action research demanded the researcher's continuous involvement in change in the host organisation. In this respect action research was a very useful research method for ensuring the research was industrially relevant and useful. Contention 2 was also useful for reminding the researcher that in addition to industrial relevance the work had to be strongly underpinned by theory. The final output of this research was a framework for implementing process-based change. This contention helped ensure the framework was designed so that it was easily understandable by others. Indeed, a practitioner's guide to using the framework has been provided in Chapter 9. The research process that was used

to develop, test and refine the framework is explained in Chapters 8-11. This process is explained in terms understandable to academics and those in industry to comply with this contention.

Contention 3

'If the generality drawn out of action research is to be expressed through the design of tools, techniques, models and method, then this, alone, is not enough - the basis for their design must be explicit and shown to be related to the theory'.

Reflections

This contention ensured the framework was firmly grounded in theory. Chapters 2 & 3 described in detailed the factors that affect implementation, implementation processes and other implementation theory that the framework is based upon. Grounding the framework strongly in literature gives the research academic rigour.

Contention 4

'Action research will generate emergent theory, in which the theory develops from a synthesis of that which emerges from the data and that which emerges from the use in practice of the body of theory which informed the intervention and research intent'.

Reflections

Action research was a useful method to collect data for theory generating. Rich insights into employee's feelings, perceptions and ideas could be gathered as a consequence of the close contact action research allows. This contention was helpful in suggesting that theory should emerge from a synthesis of the data from theory and practice. As the process of analysis developed and theory developed from the synthesis of the data and theory action research was flexible enough to be focused in the appropriate direction. Although action research is more appropriate for theory generating than testing, action research was also used to test the developed framework. Although the conditions of the project were not identical to any of the previous projects, testing was a very useful approach for enhancing

and validating the framework.

Contention 5

'Theory building, as a result of action research will be incremental, moving from the particular to the general in small steps'.

Reflections

This contention was useful in reassuring the researcher that developing theory was a long process. Understanding and developing theory did happen incrementally as the researcher worked on the action research projects. Action research on each project allowed theory generating and testing. As action research enables continuous involvement this process was iterated until the emergent theory was stable.

Contention 6

'What is important for action research is not a (false) dichotomy between prescription and description, but a recognition that description will be prescription (even if implicitly so). Thus the presenters of action research should be clear about what they expect the consumer to take from it and present with a form and style appropriate to this aim'.

Reflections

As suggested by this contention the factors that affect implementation began to emerge from the descriptions written on each project. This contention also reminded the researcher that the framework should be appropriate for its intended audience. As a consequence the research ensured team leaders and project managers were consulted throughout the development of the implementation focus group and questionnaire. The implementation focus group was tested on a project by another project manager and the complete framework was tested on a fourth action research project.

Contention 7

'A high degree of method and orderliness is required in reflecting about, and holding on to, the emerging research content of each episode of involvement in the organisation'.

Reflections

The researcher kept log books to record any relevant events such as interviews, meetings, focus groups, workshops. On reflection it is felt that being allowed to tape record interviews and meetings would have increased the value of the data. The same action research process was used for each project. The process was not made explicit to the host company; it would have been useful to do this so that the process could have been used more formally.

Contention 8

'For action research, the process of exploration (rather than collection) of data, in the detecting of emergent theories, must be either replicable, or demonstrable through argument or analysis'.

Reflections

As recommended by contention 8 a process for developing theory from the qualitative information was defined. The analysis was rigorous using triangulation to validate findings and a grounded theory approach to code the data. In addition this contention ensured a detailed explanation of how each category of the framework evolved from and is supported by theoretical and empirical evidence.

Contention 9

'Adhering to the eight contentions already described is a necessary but not sufficient condition for the validity of action research'.

Reflections

Adhering to the previous 8 contentions has ensured excellent internal validity of the action research.

Contention 10

'In order to justify the use of action research rather than other approaches, the reflection and data collection process - and hence the emergent theories - should be focused on the aspects that cannot be captured easily

by other approaches. This, in turn, suggests that having knowledge about, and skills to apply, method and analysis procedures for collecting and exploring rich data is essential'.

Reflections

Action research was not the only research method that could have been used to investigate the area of implementation. However, action research is the only method of research that could have led to the depth and richness of findings presented in this research; action research allowed a deep understanding of the problems affecting implementation, over 3 years within the context of the IBM PSS.

Contention 11

'In action research, the opportunities for triangulation that do not offer themselves with other methods should be exploited fully and reported, but used as a dialectical device which powerfully facilitates the incremental development of theory'.

Reflections

Triangulation was a very useful method to enhance and substantiate findings. Triangulation was used on several occasions to validate the emerging theories. Triangulation of both research method (focus groups and semi-structured interviews) and data (literature, company documents, interview and focus group notes) was used.

Contention 12

'The history and context for the intervention must be taken as critical to the interpretation of the likely range of validity and applicability of the results'.

Reflections

The researcher has recognised that the results of this research are based specifically on IBM PSS. This research claims to have value in IBM PSS it does not claim to be valid another area or culture. However, it can be argued that many process-based changes could be like the process-based changes in IBM PSS. Action research is an ideal method to develop a thorough and deep understanding of the context of the research. Over three

years of research the researcher has learnt much about the history, culture and objectives of IBM world-wide, UK and in PSS. The researcher has developed a good understanding of the corporate wide reengineering projects that the process changes being researched were being driven by. The depth and amount of understanding would not have been possible using other research methods.

12.5 Reflections upon the Implementation Framework

The main output of this research has been the development of a framework to improve the implementation of process-based change. The framework is based on the five themes that emerged from the data analysis. The five themes found to be crucial for successful implementation were, senior management commitment, analysis of the problem situation, user involvement, process focus and project planning and management.

To ensure each of these themes was considered throughout implementation two tools were developed; an Implementation Focus Group and a Process Based Change Implementation Audit Questionnaire.

For action research to be valid it must be usable in different contexts (Eden & Huxham 1996). Although the framework was developed from action research carried out in IBM PSS, the themes that evolved were not just relevant to IBM. The literature that each theme was supported and underpinned by illustrates that the implementation themes were issues faced throughout industry, for example, encouraging the involvement of users in a change so that commitment develops has been noted by many authors such as Alexander (1985), Terez (1990), Mumford & Beekman (1994) and Lucas et al (1990).

Research to identify the factors that affect implementation is very important. However, as Walsham (1993) describes it 'has a rather static feel to it, with no consideration of the dynamics of the process of organisational implementation'. The implementation framework seeks to provide a solution to this dilemma. Firstly, this research has investigated the factors that affect implementation. Then secondly, the factor research has been built on and a framework to manage the implementation process, (particularly of process-based change projects) has been developed.

The framework plays a very important role in setting the factors that affect implementation within the context of the particular change project. Walsham (1993) states that the factors affecting implementation are only 'simplistic concepts' that 'may be helpful to include in a broader analysis'. Walsham recommends that understanding the context and management of the process is far more important. This was the purpose of the process-based change implementation framework.

12.5.1 Reflections on the Implementation Focus Group

The purpose of the focus group was primarily to understand the themes of the framework within the context of the particular problem situation being investigated. In addition the output of the focus group is for use as input to the questionnaire design. The focus group was tested on the fourth action research project.

Initially the need to run the implementation focus group was perceived as unnecessary; for example one attendee said *"I must admit that I was a mite sceptical about the need for a focus group"*. The feedback from the focus group attendees was very positive. They said that many different areas were discussed, that there was a good balance of contribution from all attendees and the meeting was the right size, with the right attendees. Overall, the feeling was that running the focus groups was a *"good idea"*.

One benefit of holding the focus group at the beginning of the project was that the project *"really got off to a fast start"*. The focus group enabled a *"good outline"* of what the project needed to achieve to be defined. In addition, the focus group meant that the problem was thoroughly analysed. While one attendee noted *"we could have gone off at a tangent"*, one of the benefits of running the focus group was that this didn't happen. Another advantage of the focus group was that the *"project has been well planned and*

thoroughly thought through from the beginning". One of the most important advantages of the focus group was that it generated discussion about the problem and then facilitated agreement on a solution or a way forward.

The disadvantage of using a focus group to establish the project was that very few of the project team members can be involved in these initial discussions and decisions. This leads to some team members feeling excluded from the initial decisions and perhaps even uncommitted to the project at first. In addition the questionnaire results indicated a perception that the problem situation had not originally been analysed fully (figure 28). One interviewee said that this could have been caused by not publishing and communicating the outputs of the focus group widely enough.

On reflection, more time should have been spent in the project start-up meeting explaining clearly and then discussing the focus group findings. This may have helped to improve the involvement of the non focus group attendees and led to better initial commitment to the project.

The focus group was a very useful approach for understanding the themes of the framework within the context of the specific project. Other methods could have been used to gather the information, such as interviews. However, the focus group approach is relatively inexpensive and less time-consuming, particularly where the pre-designed agenda is used. Most importantly a shared understanding of the problem was established.

12.5.2 Reflections on the Implementation Audit Questionnaire

The purpose of the questionnaire was to maintain the awareness of the themes that affected implementation throughout the project. In addition the questionnaire provided a quantitative status on the state of each theme. Overall it was felt that the results of the questionnaire accurately represented the status of the project at the time when the questionnaire was administered.

The feedback from the project team about the questionnaire was extremely positive. The questionnaire gave the project team information about the project they would not normally have had. As described by a team member the questionnaire was an *"added bonus"*. This kind of status checks throughout a project was not normally carried out.

The project team stated the questionnaire provided *"a useful guide to the status of project"*, at the time the questionnaire was run. The questionnaire indicated which aspects of the project required attention. This led to work items being initiated to deal with weaker aspects of the project, so that success of the project could be maintained into the future. The sponsor said this was advantageous as it meant the project was more *"under control"*.

The low number of users meant that the number of people who could respond to the questionnaire was low. This limited the analysis of the results. In hindsight, if it had been possible it would have been useful to test the questionnaire on a larger audience, so that more complex statistical analysis could be carried out and the results exploited further. Additional analysis of the results (such as standard deviation) was completed to ensure validity. Cronbach's alpha was also calculated to ensure the internal validity of the questionnaire.

The comparison of the questionnaire results over time was useful as it allowed assessment of project progress. In hindsight it is recommended that the questionnaire be administered at regular intervals to ensure the focus on the factors that affect implementation is maintained and that a comparison of what is possible. It is possible that some questions

may have to be modified depending on or what stage of the project the questionnaire was being run. Different user groups may be appropriate to answer the questionnaire as they become involved at different stages of the project, although this would mean that results were not as easily comparable.

From experience of using the questionnaire it is recommended that the results should always be discussed with the project team. It is discussion about the results that leads to actions being put in place to address weak areas. Typically the discussion about the results prompted thought and actions about possible solutions and additional improvements to the project. Most importantly a sense of ownership and commitment to the results was generated.

Awareness has been raised and consideration has been made of the main factors that affect implementation, throughout the project. On reflection it may be useful to run the questionnaire in conjunction with a cultural and political questionnaire so that more information about the environment in which the change is taking place can be gathered.

Other methods could have been used to obtain the information sought by the questionnaire, such as interviews or focus groups. A questionnaire is one of the most appropriate methods for surveying a large number of users. In addition it is probably the most cost effective and least time consuming way to survey many people and obtain a large quantity of data.

12.6 Future Research

There are several areas where continued research could help organisations to improve the management of their implementation projects even further. The researcher was prevented by time constraints and other issues, (such as organisation structure changes) from pursuing these areas. The areas of possible future research are:

- To use the framework in different organisational contexts.
- To investigate the dependencies between the themes of the framework.
- To investigate implementation from alternative perspectives
- To develop a workbook and associated training package so that the framework could be disseminated throughout the company.

The framework has been tested completely on a process-based change project in the product planning area of PSS. Whilst it can be argued that many process changes could be like those in IBM PSS it is not yet possible to claim that the framework would be valid in another area or culture. Thus, one follow on research project that it would be useful to further this research would be to test the framework in different types of organisations so that its appropriateness in different contexts may be assessed.

This research has focused on the factors that affect implementation. It is suggested that these factors must be considered 'holistic'; that is all factors should be considered together. The relationships and dependencies between the factors were not thoroughly examined. This type of research may be important when considering the context of each project; for example altering the project planning and management system may be particularly important in one project, but not another. The unchanged themes may be affected as a consequence of altering the emphasis of other themes. A follow on project to assess the relationships between themes and their affect on implementation would be useful to understand implementation in greater detail.

There are many different ways to look at this implementation problem as noted in Section

12.2 Reflections on the Literature Review. These perspectives include, cultural, political, project management, organisational development, Human-Computer Interaction, participative systems design and socio-technical approaches to implementation. Each of these perspectives may develop a slightly differing set of issues that affect implementation. Each of these different perspectives will have to be understood in order to understand implementation in totality.

A series of potential follow on projects taking different perspectives is recommended. Projects should be from the organisational culture, political dimensions, project management and organisational development perspectives. The same research questions developed for this research (see section 3.3) would apply to these projects. A literature review into these domains should be completed. Then action research and data analysis should be completed using the research approaches prescribed in Chapter 4. Completing these additional projects will lead to a broader understanding of implementation that will enhance and develop the Implementation Framework.

To ensure that this research is as useful to the practitioner as possible a workbook and training package should be compiled. The compilation of an education and training package would maximise the use of the research. It would aid the transfer of knowledge gained through this research to industry.

12.7 Summary of Contribution

The contribution of this research is twofold. Firstly factors that affect the implementation of process-based change have been identified. The contribution is in the process of analysis that was used to identifying these factors. While many authors have carried out implementation factor research (Meredith 1981, Lucas 1981, Kwon & Zmud 1987, Lyytinen & Hirschheim 1987, Swanson 1988, Land et al 1989, Grover 1995, McGolpin & Ward 1997), the factors are generally being identified from surveying organisations or literature reviews, this research differs as factors were identified from in-depth action research in one company over three years. In addition, theory evolved from rigorous data analysis that involved a synthesis of theoretical and empirical evidence using a 'grounded theory' approach. This approach to identifying the factors that affect implementation has not been found in the literature.

A framework that a practitioner can follow to improve the management of implementation of process-based changes projects has been developed. The second and main area of contribution is in the process developed to use the framework. Particularly in the ability of the framework to adapt to the specific context it is being applied to. The process for running the focus group and developing and administering the questionnaire within a project management structure are the most important aspects of the research.

The framework was tested on a fourth action research project. The use of the framework raised awareness of the factors that affect implementation and ensured that these factors were audited throughout the project. This gave some striking evidence of the practical success of this approach.

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Appendix

Appendix 1

Action Research Characteristics (Gummesson, 1993)

1. The action researcher has two roles; to contribute to the client company and to make a contribution to science. The researcher should try to satisfy both the goals of the management of the company and the interests of the scientific community. The researcher may have to compromise personal goals for that of the company they are working within. The research goals may have to be compromised in place of the practical results that are being sought.
2. Gummesson says that 'The action scientist takes action.' Action research requires the researcher to be actively involved and have some influence on the project they are participating in. As noted above Checkland would suggest that the researcher and the client company must be involved in change. Observing the change is not enough.
3. The action researcher should interact closely with those involved in the change. All involved should learn from each other. The researcher in particular should be able to reflect on the changes using explicitly stated theories to create and develop new improved theories.
4. Action research should take a holistic view of the change under investigation. This means that all factors that are involved in the change should be examined. The effect of these factors in total, on the change should be considered. That is to say a reductionist approach should not be taken where each factor and its effect is considered independently of the others. This point complements the hermeneutic underpinning of this research, as the 'social whole cannot be understood independently of its parts, and vice versa' (Burrell and Morgan 1979)
5. The researcher and the client personnel must co-operate and work together. This co-operation should lead to feedback between those involved, which in turn could lead to continuous improvements.
6. 'Change processes are usually complex'. Gummesson states that being an 'actor on stage' in an organisation gives the researcher an invaluable insight into understanding, planning and implementation of change. This is an important point as investigating the inhibitors to implementation will involve examining the whole process of change.
7. It is important that the ethical framework that is applied to a research project is understood. Rapoport's definition of action research above goes further than this, to say that it must be a 'mutually acceptable ethical framework'.
8. An understanding of the area of business and type of industry the researcher is based in is important. This will be important to understand the process changes within the context of the organisation and other process changes that are taking place.

9. Action research should be led mainly by hermeneutics, although some elements of positivism may be utilised. Action research should be characterised by a cycle of preunderstanding, understanding, preunderstanding. Understanding is developed when the researcher steps back from the action and using appropriate frameworks analyses and reflects on the change. The purpose of reflecting is to develop and enhance understanding of the change with an aim to develop new knowledge and theories and to develop 'new analytical concepts, tools, frameworks, which are apparently more appropriate, or more useful, to the understanding of this kind of problem.' (Warmington, 1980). Equipped with this and other preunderstanding the researcher should then step back into the change and become involved in action again. Argyris et al (1985) also states that action research is based on an iterative cycle. This cycle is of problem identification, planning, action and evaluation, where it is important to focus on applying problem solving techniques, communications and feedback mechanisms.

APPENDIX 2

IBM Report

Dr Roger Maull, Zoe Nash
22 July 1996

Background

This project was set up as a joint collaboration between the University of Plymouth and IBM CSD. It began with a meeting between Roger Maull, Chris Buckland and Neil Corder in January 1996. At this meeting there was an agreement for Roger Maull and Zoe Nash to work on a project area which was an immediate IBM need. Such a project would provide the University staff with good practical experiences from which to write a research paper. For IBM it would take as a starting point the Coopers and Lybrand report and investigate in more detail the nature of the process problems.

Objectives

To identify the extent of change required to improve the provision of central support i.e. in the ESSG, Software, networks, assist and AS400 areas.

Introduction

This report has been produced as a result of data gathered from over 30 interviews. The people involved include;

Chris Buckland, Brian Checker, Adrian Judge, Chris Lockhart, John Steadman, Tony Dunc, Peter Priest, Bill Cullum, Bruce Edwards, Dave Walden and Colin Grieves.

Process Summary

This section is a summary of the process models.

The scope of this information gathering project has been confined to five support areas, these are:

- Enterprise Systems Support Group (ESSG)
- Enterprise Systems Software Support Centre
- Enterprise Assist
- Assist AS400
- Network Support Group

and their integration with the National Call Management Centre.

National Call Management Centre (NCMC)

When a customer first places a call to a support centre they are connected to the NCMC. The NCMC is a central call handling group who act as the first point of contact for customers when they are reporting a problem. The process that the NCMC use is illustrated on page 2 of the IDEF0 diagrams.

The process is initiated when a customer voice call is received. The NCMC staff take the customers name and brief details about the problem. NCMC staff determine the problem type and these details are then entered on a database called Retain. The problem is entered on Retain as a PMR (Problem Management Record). More specific terms that are used are a PMS (Problem Management Record for Software) and a PMH (Problem Management Record for Hardware). Retain routes the problem to the relevant queue in the relevant support area.

An important piece of information that the NCMC collect is the severity level of the problem. There are 3 levels:

- Severity 1 - Companies system down
- Severity 2 - Applications down which is effecting business
- Severity 3 - Any other problem

If the problem is a hardware (H/W) problem then the details are automatically transferred to another database called RCMS (Retain based Call Management System). RCMS is the system that is used to track CE calls, availability and work allocation. The PMH is then routed to the relevant queue in the relevant support area, at the same time the customers relevant Customer Engineer (CE) is automatically paged when the PMH is completed and sent. The CE is paged so that they can be kept up to date with the problems that their customers are having.

The NCMC also carry out a certain amount of entitlement checking which verifies whether the customers are entitled to the service they are requesting.

Hardware Support Centre Process (HSC)

The process by which the H/W calls are resolved can be viewed in diagrams A61, A613 and A614.

Diagram A61 (p.4) illustrate the high level process. The process begins when a PMH is received into a H/W queue. The support centre specialists calls the customer back. Further problem details are collected from which the specialist either starts to fix the problem, decides that the problem should be passed to another support centre i.e. the problem is not a H/W problem or no action is required and the call ends.

In the case of the specialist starting to fix the problem (as illustrated in A613) there are several issues which the specialist has to assess. Firstly the need for a CE is considered, the specialist spend 30 minutes trying to fix the problem remotely i.e. from the IBM support centres in Warwick, Portsmouth or Basingstoke, after this time it should be know if a CE is required to go on site. If a CE is required the HSC send a copy of the PMH to the NCMC so that a CE can be paged and all the available information on the problem passed on.. The specialist may also decide that there is a need for some parts, these can then be ordered at this time. Finally it may be decided that the problem can not be fixed without more information, therefore there may be a request for additional dumps and traces from the customer.

The problem may be fixed remotely without the need for a CE through searching for fixes and similar problems on Databases (Freddy, Retain). Alternatively it may be possible to put a series of procedures in place which will enable the customer to by-pass the problem.

If the problem cannot be fixed then it is escalated to a specific specialists or development area.

The HSC specialists may also receive calls direct from CE's when they are on customer sites asking for additional help with the problem.

Enterprise Systems Software Support Centre

Diagrams A62, A621 and A622 illustrate the problem handling process in the software support centre. This process is initiated when a PMS is received at the software support centre. The call is first dealt with using the Enhanced Call Routing (ECR) process. If the problem cannot be fixed here it is passed on to the application specialist, and then it is escalated to a change team if required.

The ECR process (A621) is initiated when a PMS enters a queue, the customer is called back by a specialist so that additional problem details can be gathered. The process of the specialist dealing with the call from the outset is know as ECR. The specialist spends 30 minutes attempting to find a part time fix (PTF) for the problem, where necessary additional information is requested from the customer, such as dumps and traces. If an appropriate fix is found the fix is dispatched to the customer from IBM's distribution site. When a PTF is not found the problem (PMS) is passed on to a applications specialist (it is sometimes possible that this may be the original person who took the call, in which case, they continue to work with the problem).

The application specialist deals with the problem using the same process as for ECR. If a fix cannot be found then the problem (PMS) is escalated to the change teams. In most cases change teams or other escalation routes usually comes from the original product or service provider.

Enterprise Assist (EA)

Diagram A63 illustrates the process for dealing with an EA customer call. EA take about 66% of their customer calls live. Those calls that are not taken live enter a queue, and a specialist returns the call within an hour of the time the call was logged. The support centre staff deal with the problem or they pass it on to another support groups if it is decided that the problem is not an EA problem. If no fix is found the problem is escalated to international technical support. When the problem is solved the PMS is closed.

Once the support centre staff receive a live call they try to solve the problem using the process shown in diagram A631. The problem is first dealt with using the support staffs past experience and knowledge, databases and manuals. If the call is an assist call then a solution is sought straight away and assistance given. If the call is a defect problem then a PTF is searched for on Retain. If no fix is found the problem is passed to the software support group.

Assist 400

The Assist 400 problem handling process (A64) begins with either a direct customer call into the centre or a customer call via the NCMC. If a call comes in directly to the support centre the first activity is to check whether the customer is entitled to the service they are requesting. If entitlement is verified, appropriate action is identified which may be either resolving the problem, or passing it back to the NCMC to be routed to another support centre or flagging the problem as severity 1.

A call that comes from the NCMC enters the Assist 400 queue as a PMR. The support centre staff call the customer back to collect the problem details, they then seek a fix to the problem. In order to resolve the problem a CE, parts or additional dumps and traces may be required.

Diagram A643 illustrates that a severity 1 problem must either be resolved or escalated immediately. Other severity problems are routed to 1 of 3 specialist teams. These specialist teams are either systems, connectivity, or hardware teams.

A6432 illustrates the process for dealing with an PSS400 systems problem. A PMS is sent to the systems team, their first task is to identify appropriate diagnostics that are required from the customer. Once the customer has been contacted, an action plan for fixing the problem is agreed. A PTF is sought, if no fix is found additional diagnostics are requested. If however the problem is still unsolved then it is escalated to the change teams.

The process for dealing with a connectivity problem (A6433) starts by the support centre contacting the customer. If the problem is a high-end PMR (WAN based technology) then the IBM systems dial into the customers systems remotely. The IBM systems diagnose the problem remotely then support centre staff use this information to search for a fix on Retain, the Internet and forums etc. For a low end problem (LAN based technology) the problem has to be isolated first before

the IBM systems can dial in.

In order to deal with a hardware problem A6434 a PMH has to be received by the H/W team. The H/W team decide if a CE is required, if the problem can be by-passed or fixed then no CE is called. When a CE is required a copy of the PMH is made and sent off to the NCMC so that a CE can be paged. Finally if the problem cannot be fixed by the H/W team, then the problem is escalated.

Network Support Group

The process responsible for supporting network products (A65) starts when a PMR is received into the network queue. Network problems are split into hardware low-end, hardware high-end and software problems. In some cases a CE may be required in which case a copy of the PMH is sent to the NCMC so that a CE can be paged.

The process for dealing with a hardware problem (A652) starts by the support centre contacting the customer. If the problem is a high-end PMR (WAN based technology) then the IBM systems dial into the customers systems remotely. The IBM systems diagnose the problem remotely then support centre staff search for a fix on Retain, the Internet and forums etc. For a low end problem (LAN based technology) the problem has to be isolated first before the IBM systems can dial in.

In order to solve a networking software problem (A653) the support centre staff start by phoning the customer back. Additional information about the problem is collected for problem determination. Retain is then searched for a suitable fix. Additional dumps and traces may be requested from the customer. If the problem is still unsolved, it is escalated.

Process Improvements

The IDEF modelling has been difficult. Not least because most groups do not have a written description of the process. In addition, the activities are essentially problem solving, it is intuitive and does not render itself to over formalisation.

During the model building process four immediate areas for process improvement arose.

1. There are so many groups owning parts of the process that I would find it difficult to define it as a process - a classic case of functional specialisation. Few people described the process in the customers terms i.e. from a problem being raised to a problem being solved. Most groups described it differently and placed different emphasis within the process. Consequently, getting numbers or measures that matched up across the whole process is very difficult.
2. There are a series of highly ambiguous hand-offs in the process. Principally, this occurs when a hardware fault is logged in NCMC. It can involve ESSG, Networks or AS400. From the models we can see that a hardware call can be passed directly to the CE, paged to the CE and sent via retain to ESSG or simply sent to ESSG. This leads to confusion, with ESSG calling the customer whilst the CE is there or even after the CE has fixed the problem. This urgently needs some clarity.
3. A number of groups deal with Network problems i.e. Network Support Group, AS400 and ESSG. This must lead to some confusion to the customer, however it seems well dealt with internally.
4. There is also some ambiguity in dealing with Enterprise software calls, particularly if they enter as Assist calls. Approximately 15% of Assist calls are defect calls and it is clearly in some cases a fine line between and assist and a defect fix call.

Process Improvement Recommendations

I would recommend we begin by further investigating the NCMC ESSG hand over with the aim of designing a more robust process with clearly defined procedures. This should lead to more calls being dealt with centrally and probably more efficiently.

I would also propose that a standard set of measures be adopted across each of the processes, providing the necessary data for future process improvements.

Process Re-design Recommendations

The Coopers and Lybrand report indicated that IBM provides very good service but at a cost base which is, at best, average for the sector. The areas for improvement seemed to centre around efficiency gains whilst maintaining or improving service levels. Substantial changes are unlikely to be achieved on both fronts without a radical re-appraisal. In all our research the evidence is clear, those that aim higher achieve more.

In my view the whole process is ripe for a radical re-appraisal. The means to achieve that should be an amended version of the IBM ten step approach. Amended, because it is clearly a local initiative approach.

Taking best practice as a model I would focus change on six dimensions; strategy, human factors, IT, performance measures, scope of change and process architecture. In view of the extensive work already carried out elsewhere on IT, performance measures, scope of change and process architectures I will focus on strategy and human factors.

1. Strategy

I would begin with a strategic review. If we were to choose a reasonable time frame eg five years what would the market place look like? A useful framework is to think in terms of three strategic options;

- To identify customer requirements in the key order winning criteria. Eg lead time to fix, price, service quality, product quality etc.
- To match and beat the competition on key benchmark criteria eg those outlined in the Coopers report
- To identify core competencies and use these competencies to provide alternative services.

The first two are traditional strategy making modes but are classic *follower strategies* the competency model is a *leader model*. A thorough going strategic review of this process using all *three* models would move the organisation from a incrementalist to a more radical approach. It would also indicate the appropriate process configuration, not just for now but to meet future customer needs.

2. Human Factors

It is clear that IBM has gone through a number of major change programmes in recent years. However, I am unclear to what extent these have really changed the organisation. For example, two very strong cultural issues in IBM are the role of the CE and the importance of the "big blue box". The importance of these issues often underpins peoples perceptions. However, future strategy might point to a diminishing role for the CE and a more multi-vendor small machine environment. The dissonance between future strategic role and low level cultural assumptions should be investigated At some point, in the near future, I would suggest that IBM try to gather data on the organisational culture for the purpose of comparing cultural "taken for granted" with the organisational strategy.

3. Information Technology

I am aware that a substantial amount of effort is going into the technological re-design of this process. This includes SPOE, CRM developments supported by SAP and many others. The impact of these upon the re-design would need to be assessed.

4. Performance Measures

I am aware that a substantial effort has been made to apply the ideas of the 'balanced scorecard' in IBM CSD. It would be good to see a set of stretch goals emerging from a strategic project associated with these common measures.

5. Scope of Change

This is closely associated with strategy. Strategic re-designs invariably aim for a more radical approach, with improvement initiatives aimed at local level. All our research within 32 lead edge BPR companies has pointed up the importance of radical re-design based around a process approach.

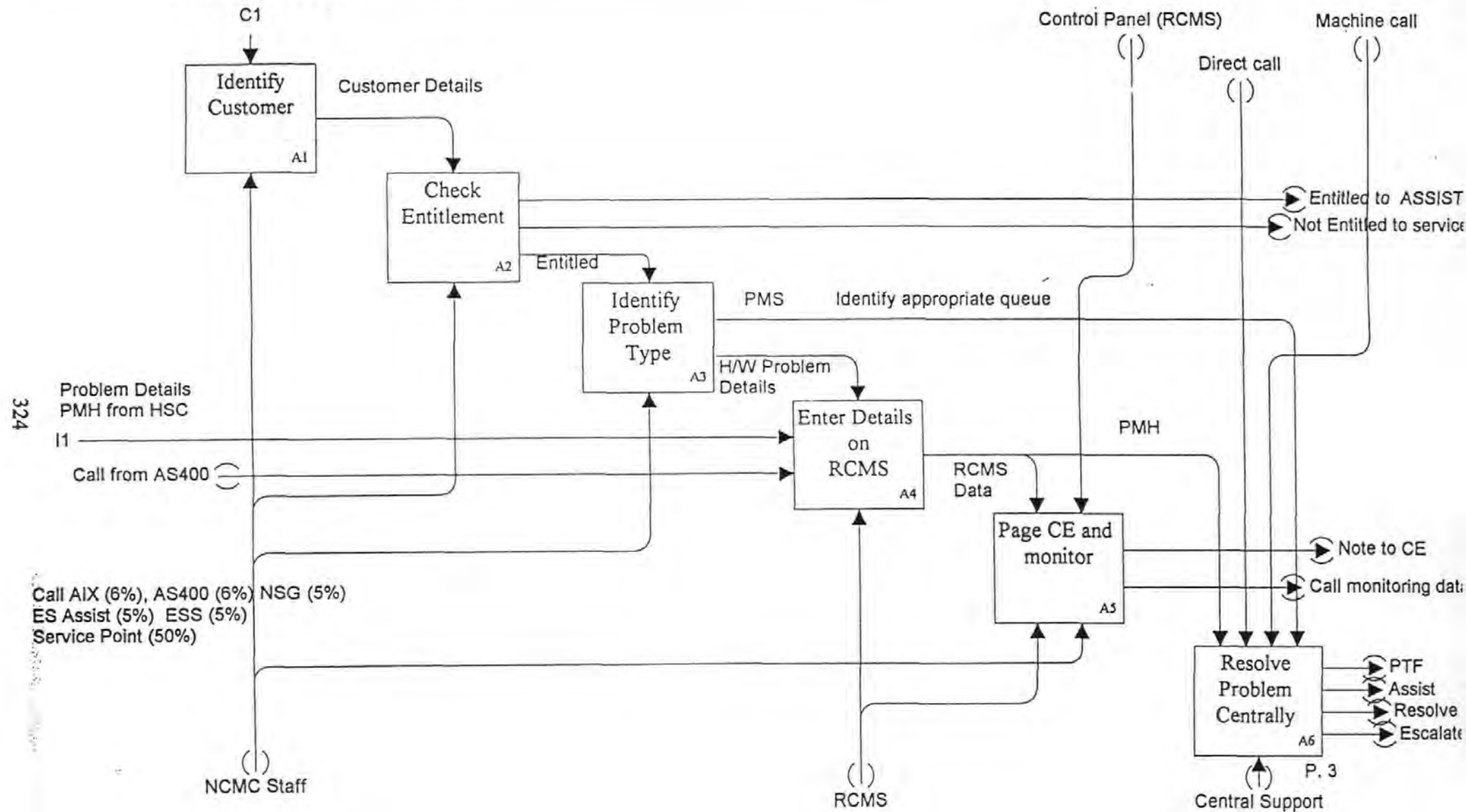
6. Process Architecture

The CRM model provides the high level architecture. However, it is debatable as to what extent this has permeated through to the central support provision. The core question is what constitutes a whole process? what are its boundaries? and what are its objectives?

Conclusions

The potential for a radical approach to re-design is high. Service levels are high and efficiency is about average for the sector. A strategic look out would give central service provision a focus around which process re-design should take place. My only qualification is that we should begin by knowing the current state. We now know about the complexities in the process, we also need to know the complexities in the various organisational 'taken for granted's'. A strategy which aligns culture and processes is a recipe for success followed by Rover, ICI, Milliken and Xerox. My reservations are a hesitation in ever providing IBM further grounds for procrastination. A two-fold approach may be best, begin now on improving the NCMC/ESSG link, get the benefits from that change and then look to the more radical re-design in the near future.

Customer Voice Call



PMH
()Assist Direct Call
()Machine call
C3Assist
O2PTF
C4O1
C1Direct call
C2Manage ES
Hardware

A61

P. 4

Manage ES
Software

Calls

A62

P. 7

Manage ES
Assist

A63

P. 10

PMS

Manage
AS 400

A64

P. 12

Manage
NSG

A65

P. 17

Manage
Service Point

A66

Resolved Problem

PTF

Assist

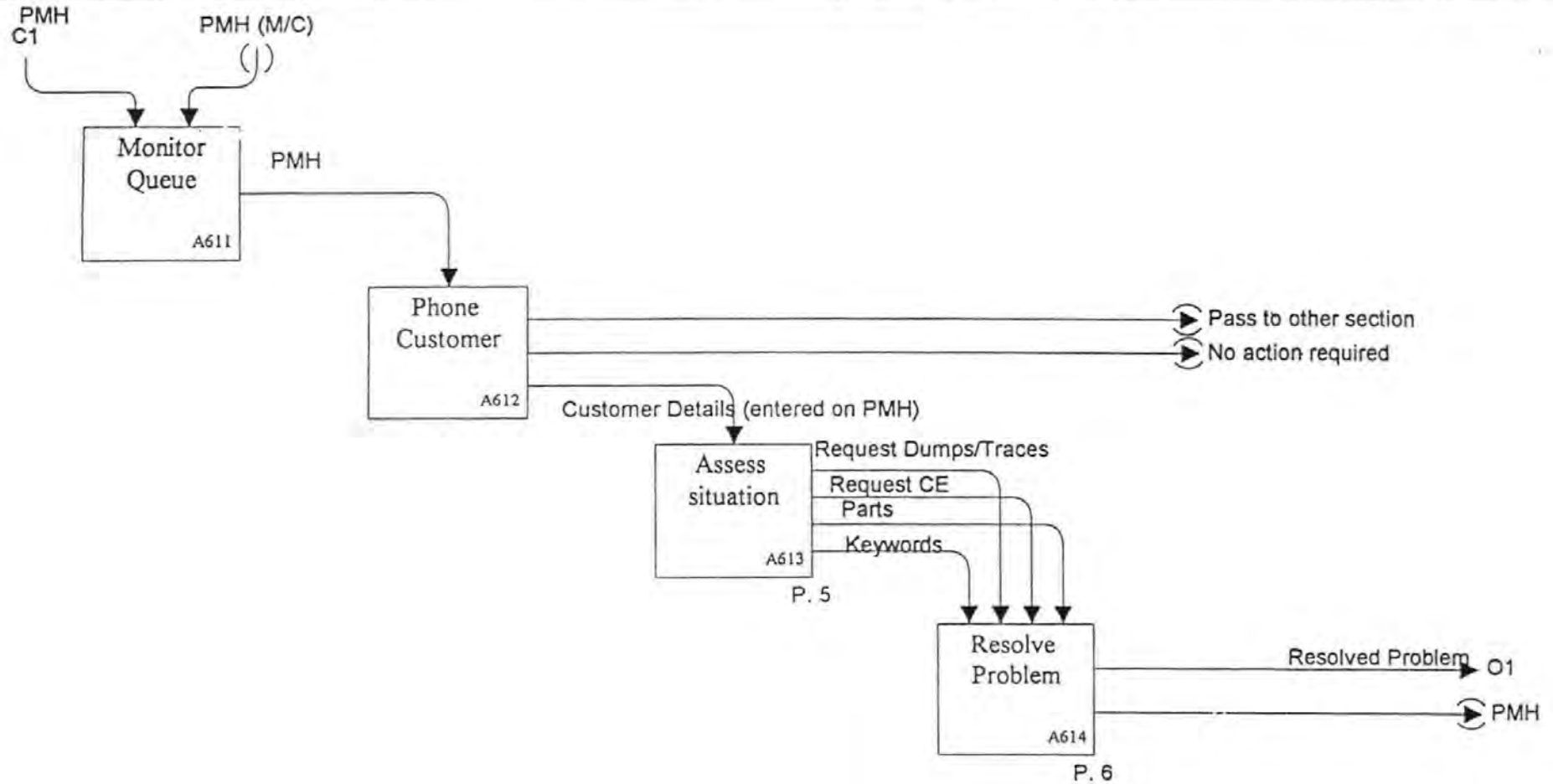
Resolved Problem

Resolved Problem

Resolved Problem

M1
NCMC StaffM1
Central SupportResolve Prob
O3Escalate
O4

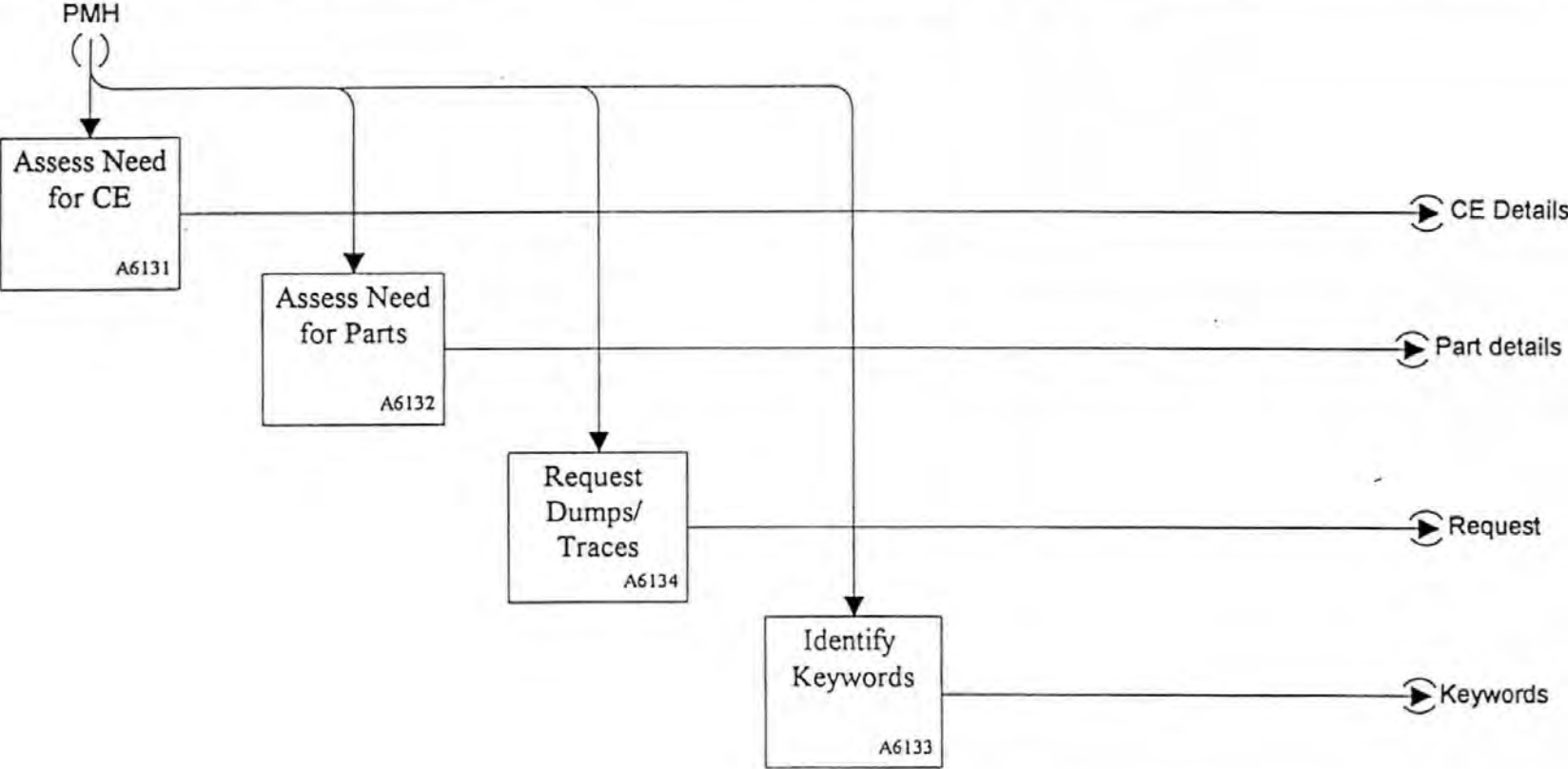
325



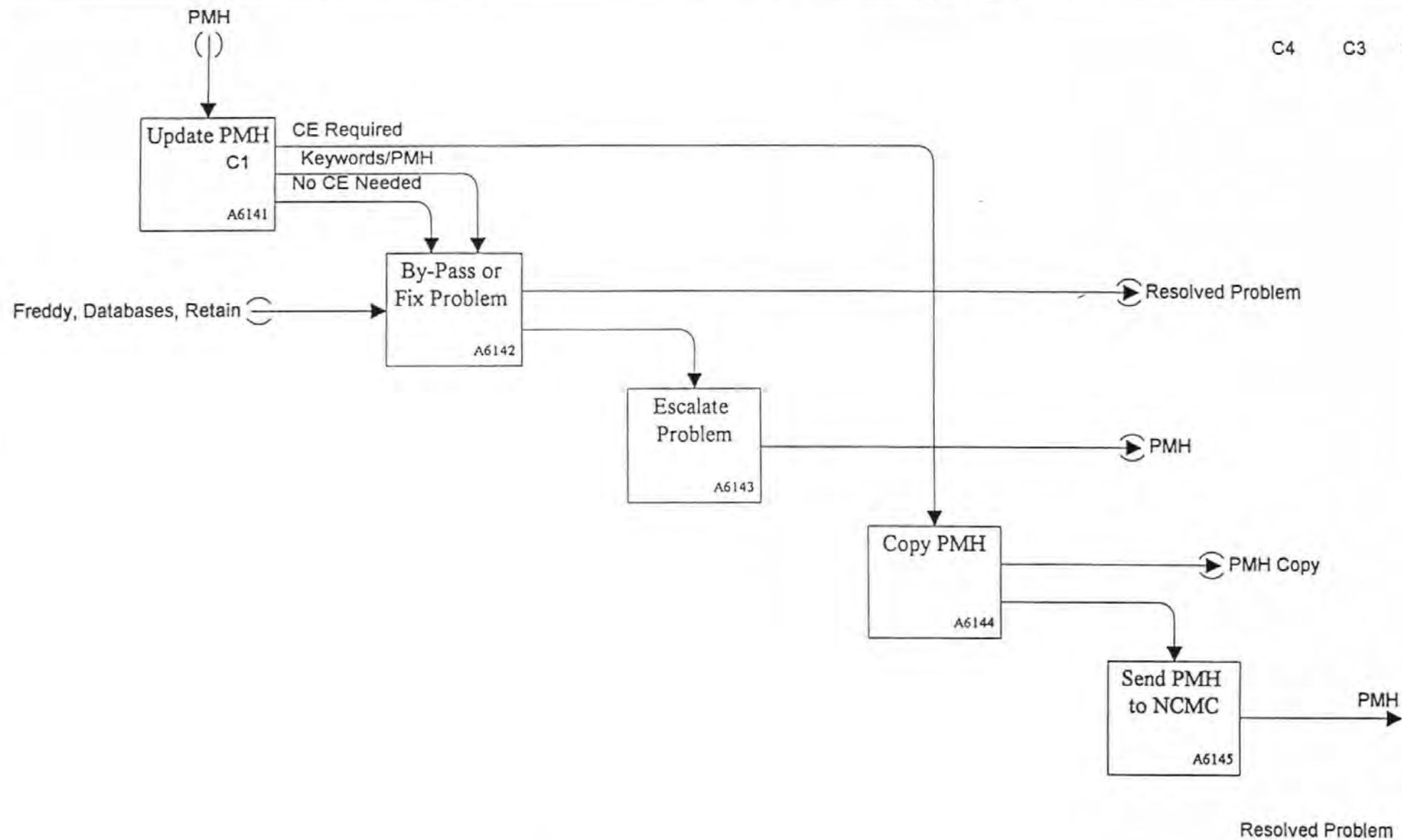
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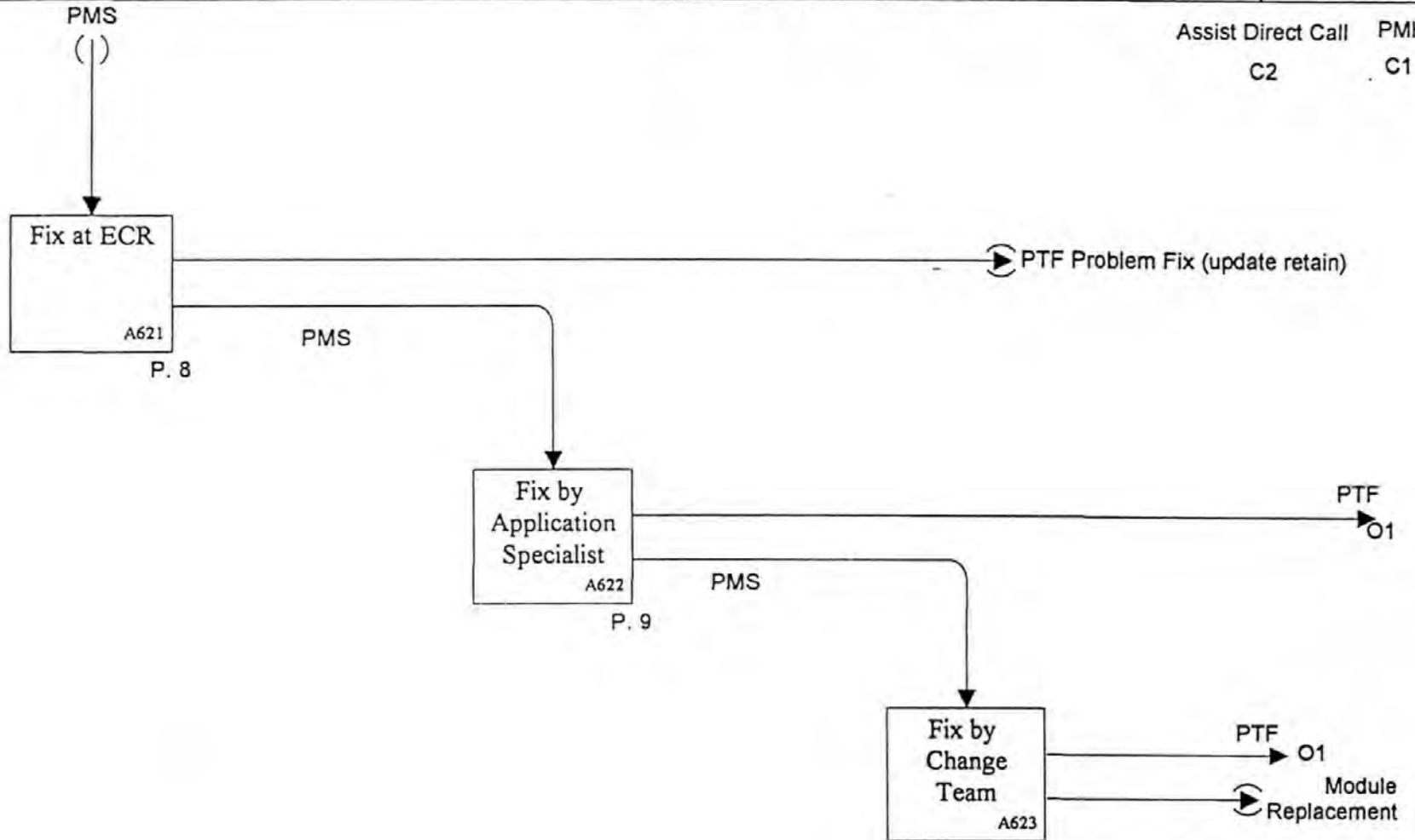
M1
NMC Staff

PMH Resolved Problem
C1



327

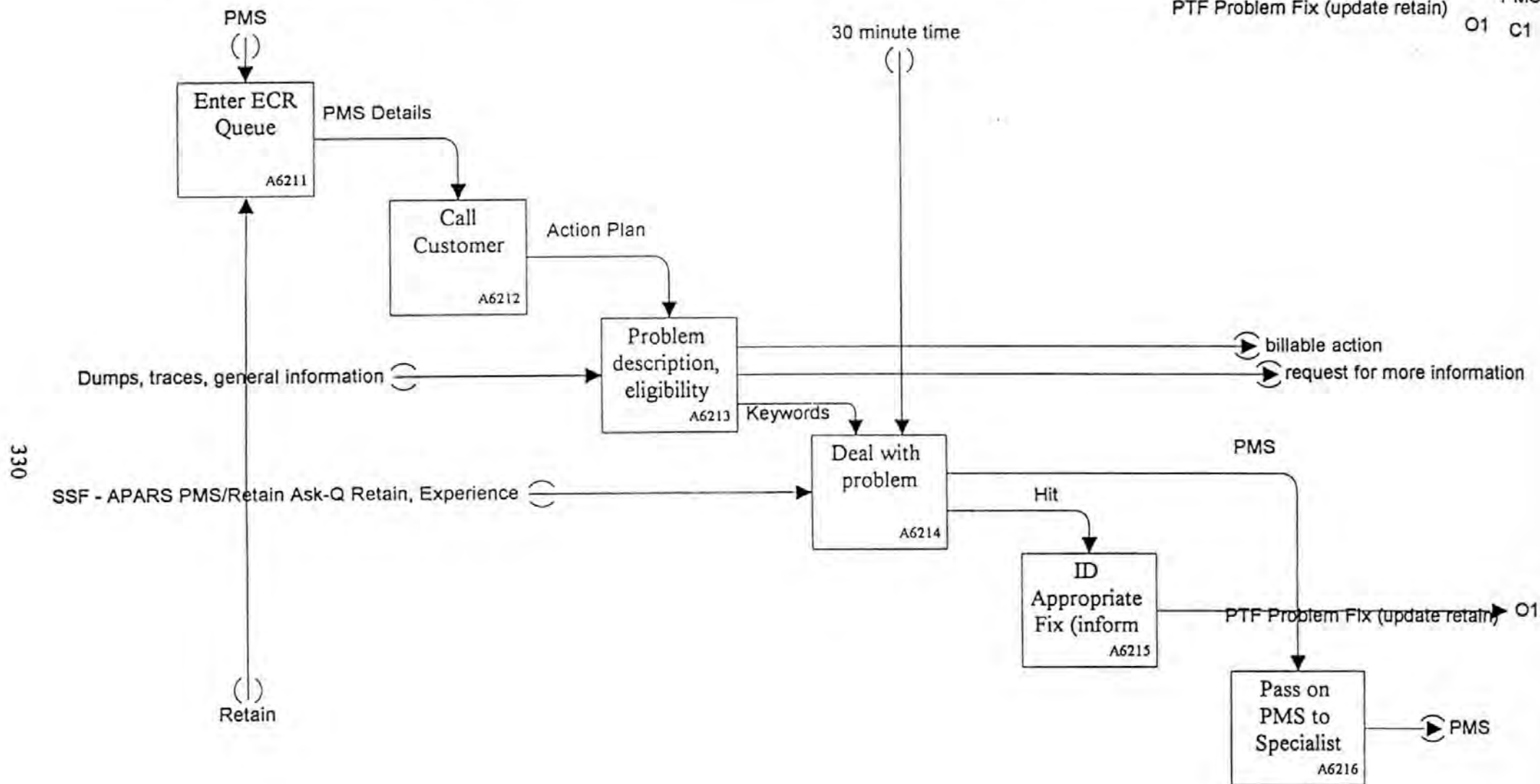




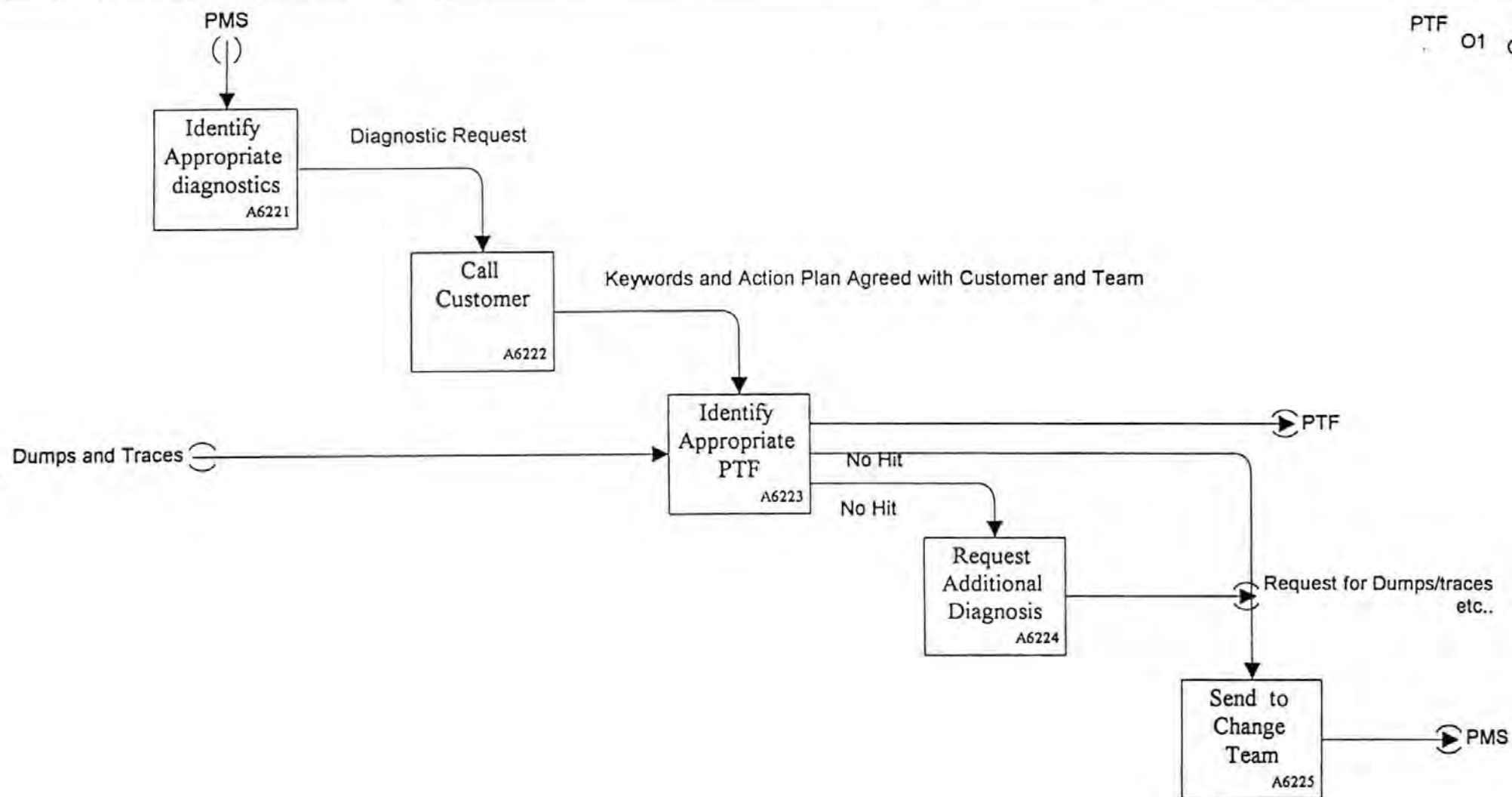
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M1
NCMC Staff

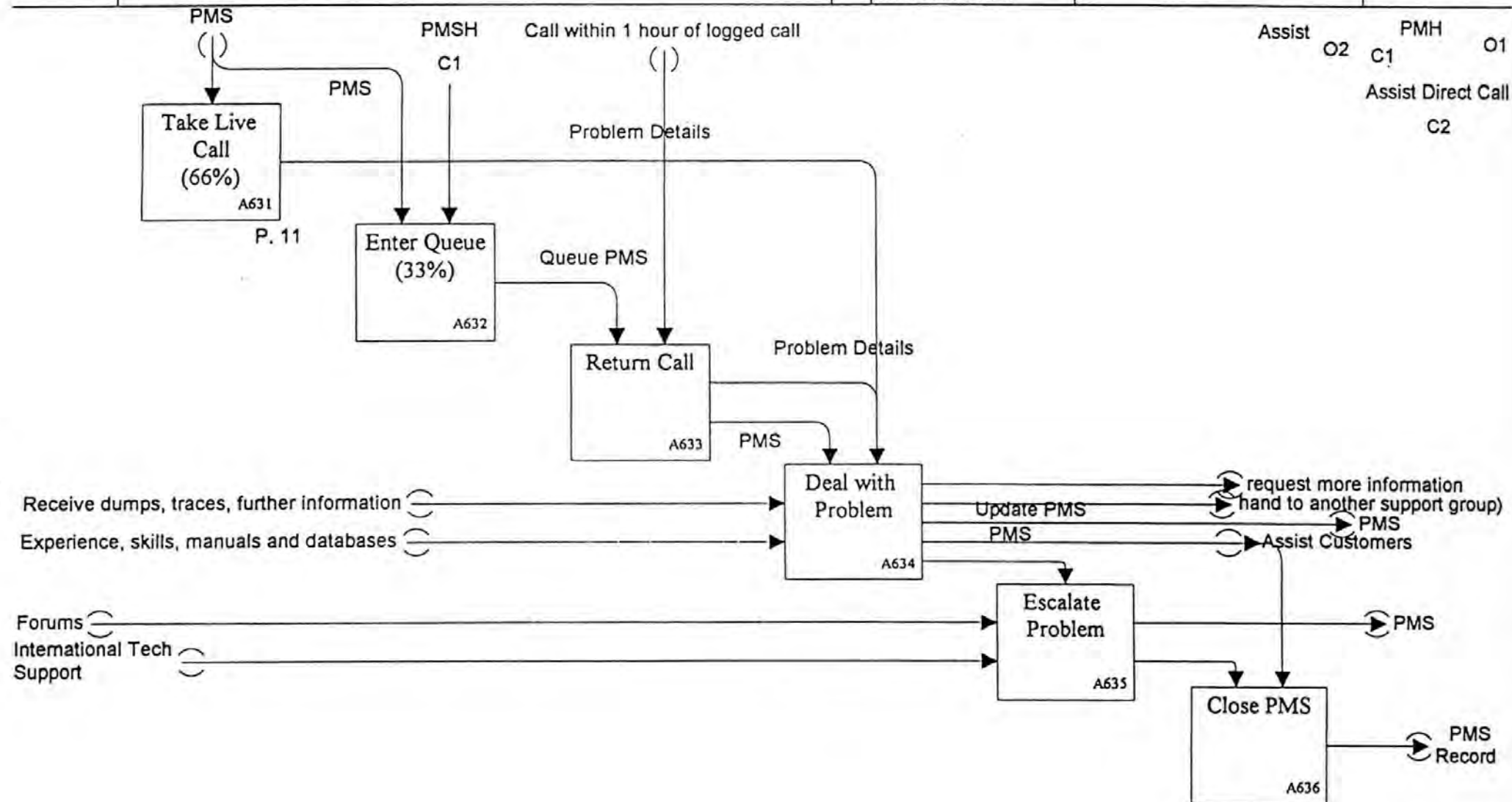
I2
I1
O2
P. 7



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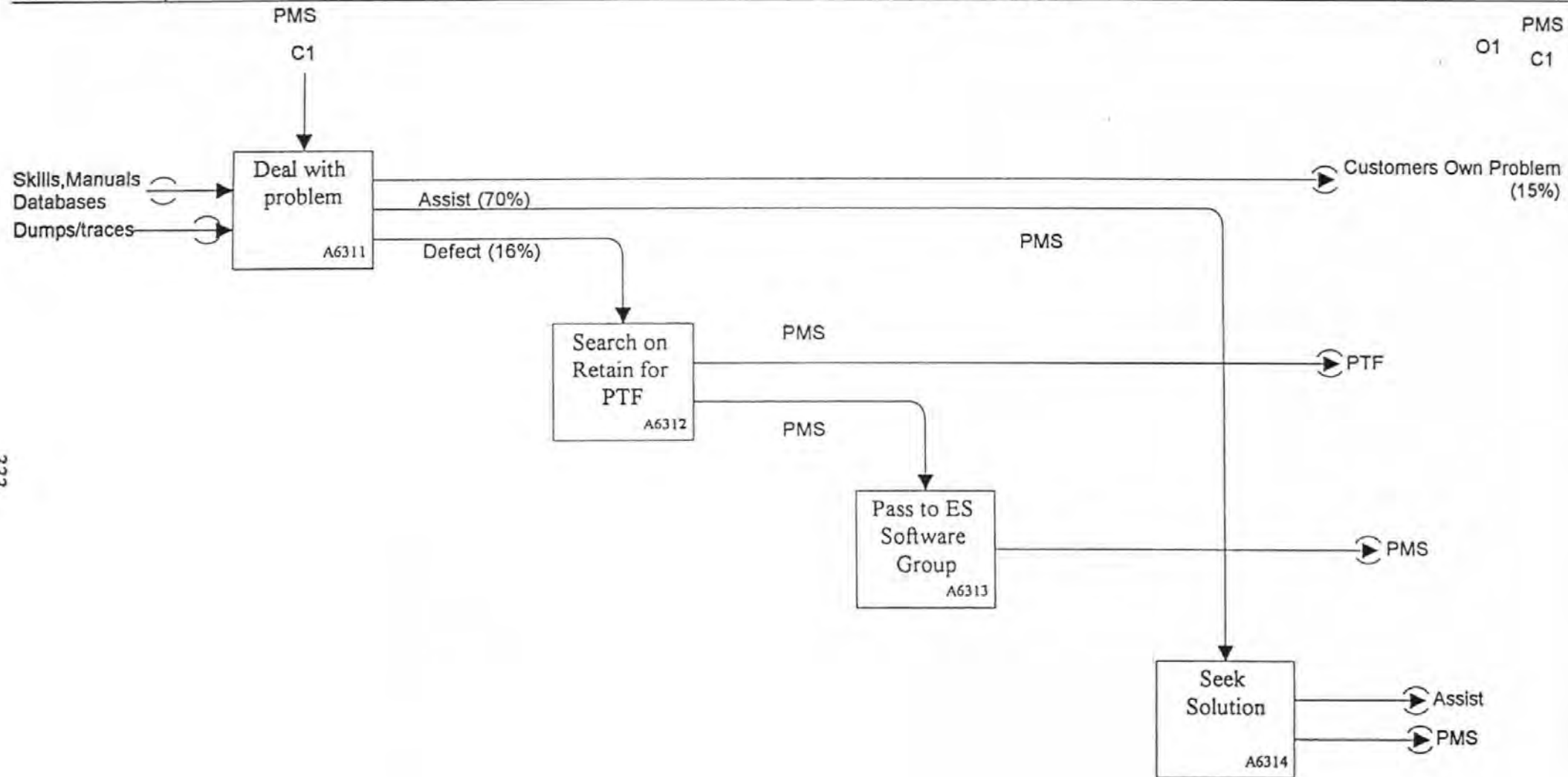


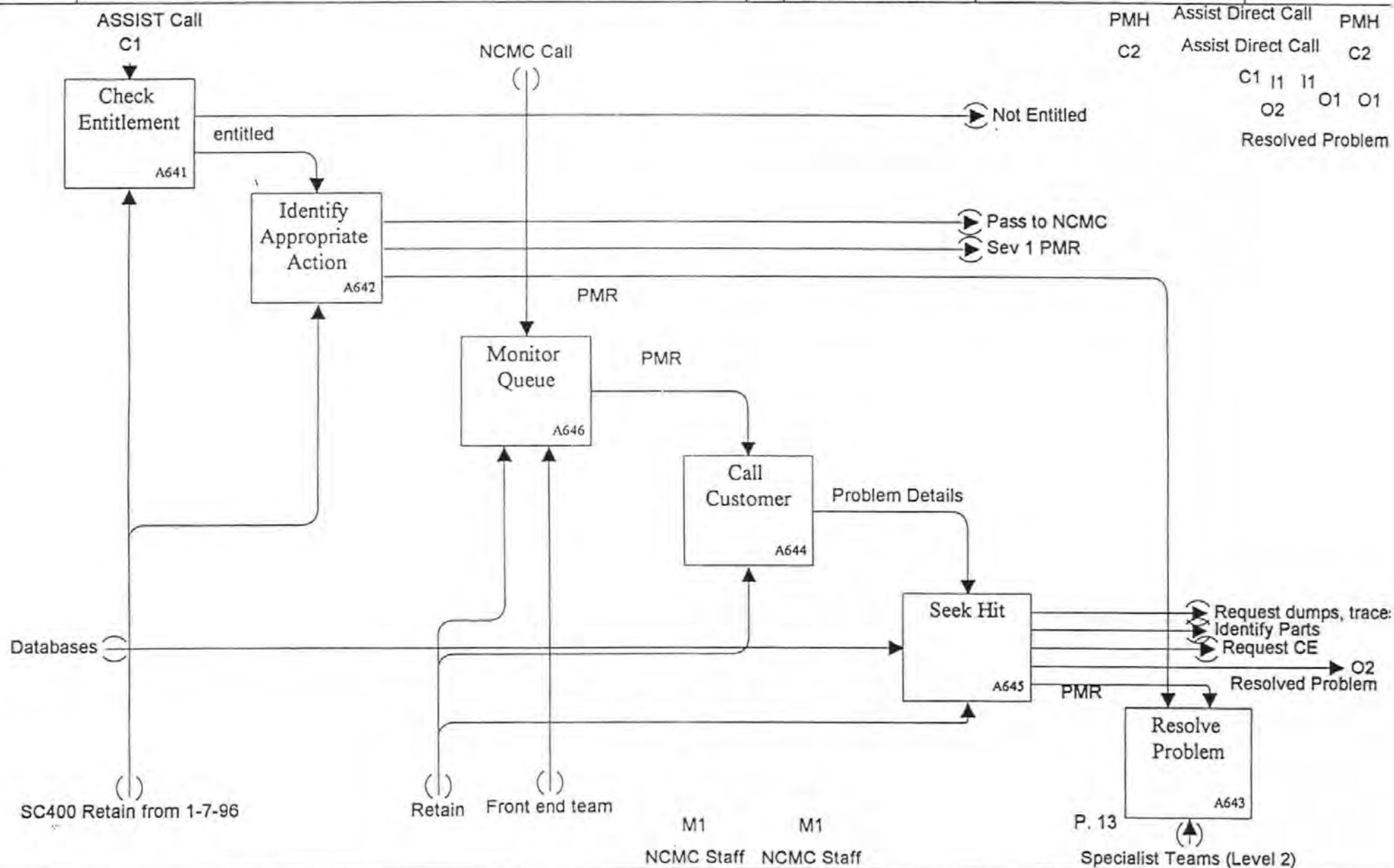
M1

NMC Staff

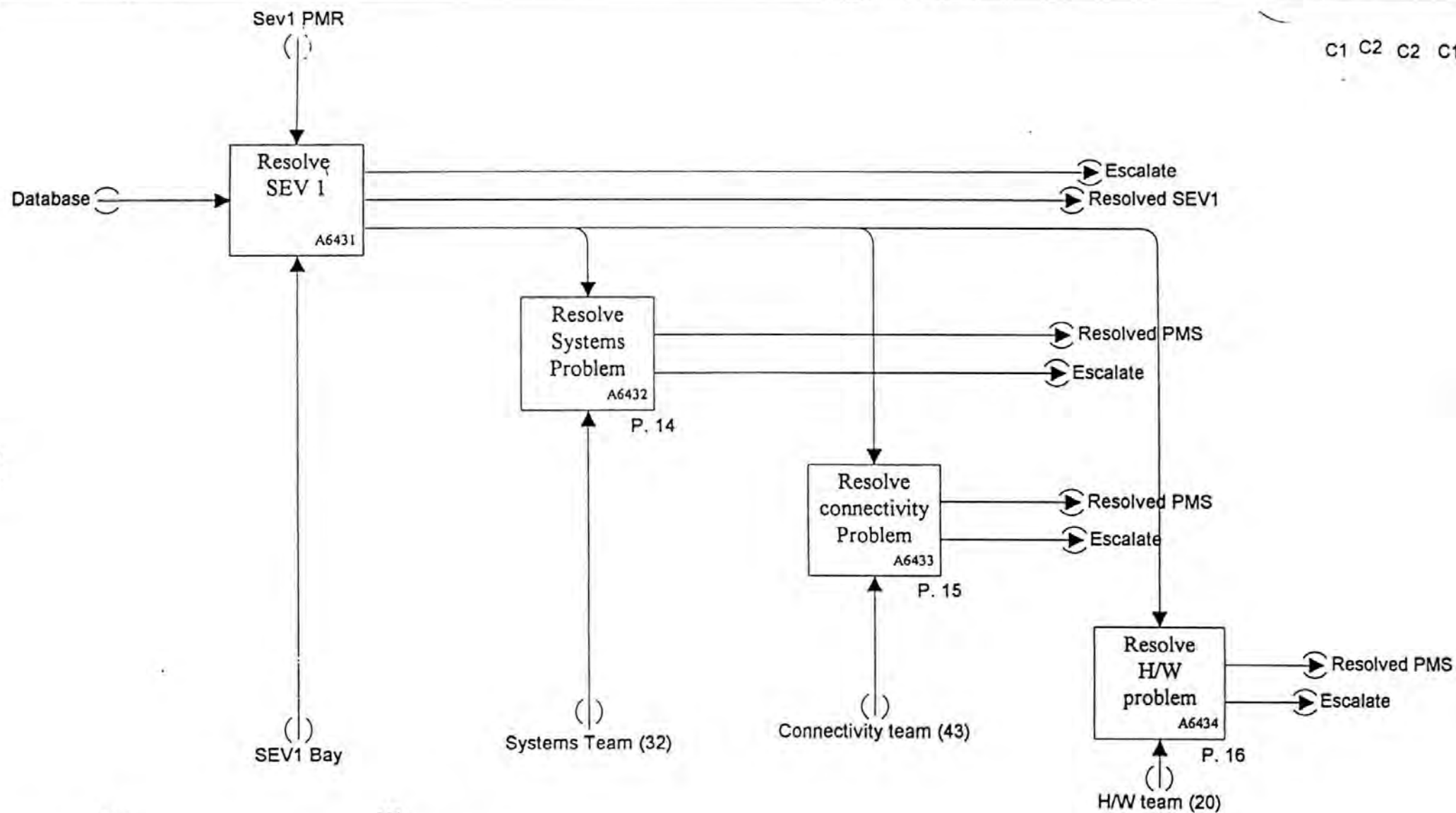
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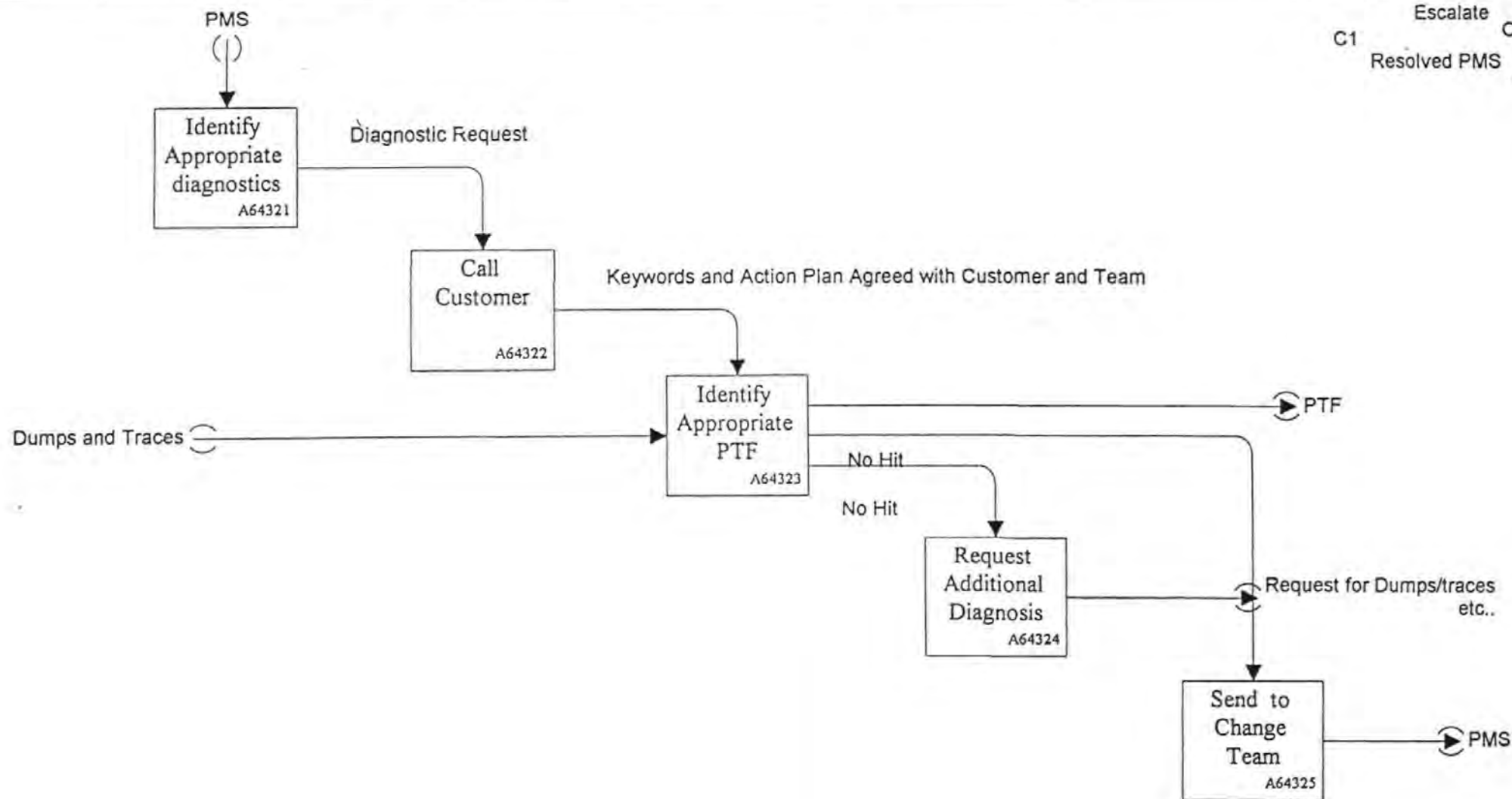


M1

Specialist Teams (Level 2)

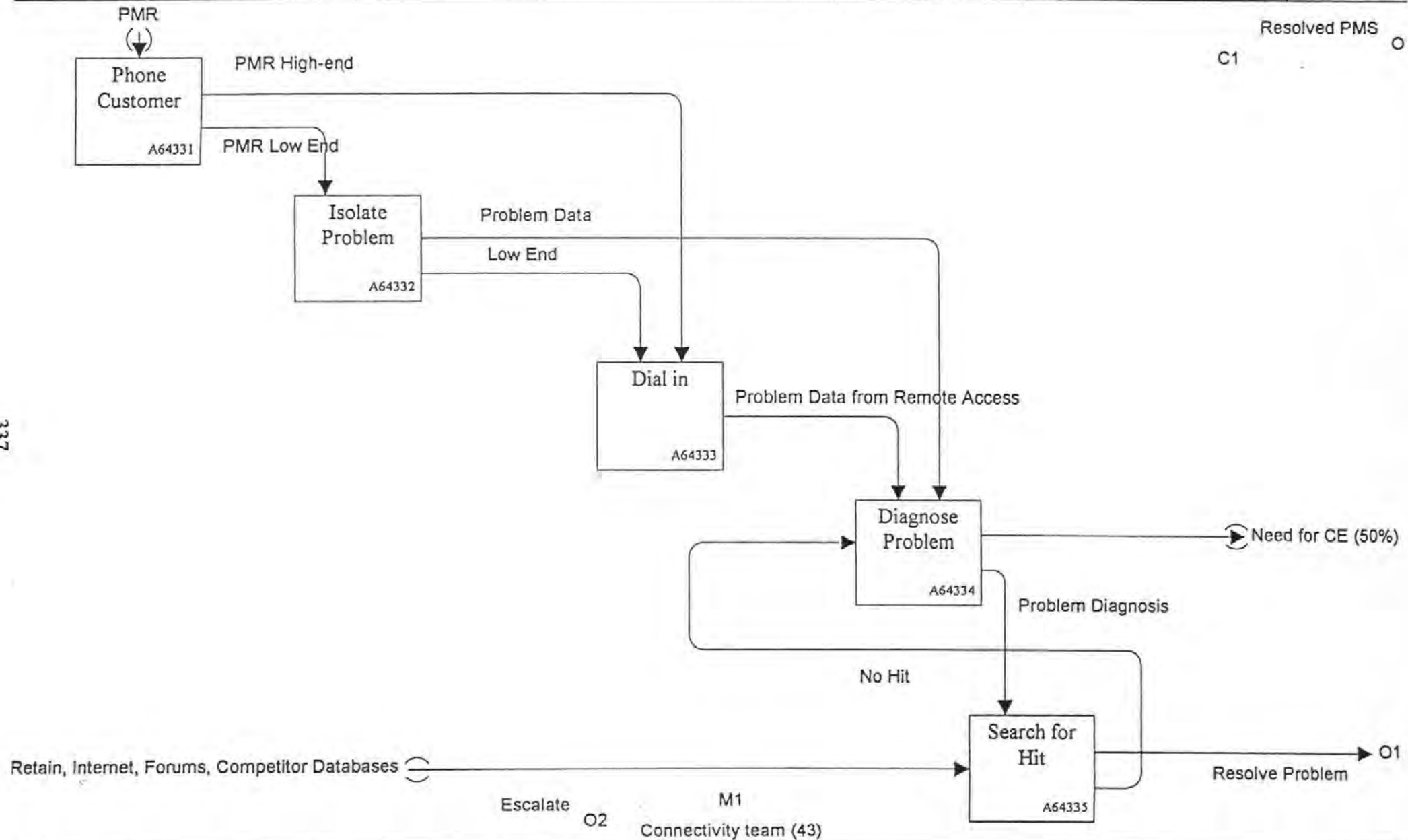
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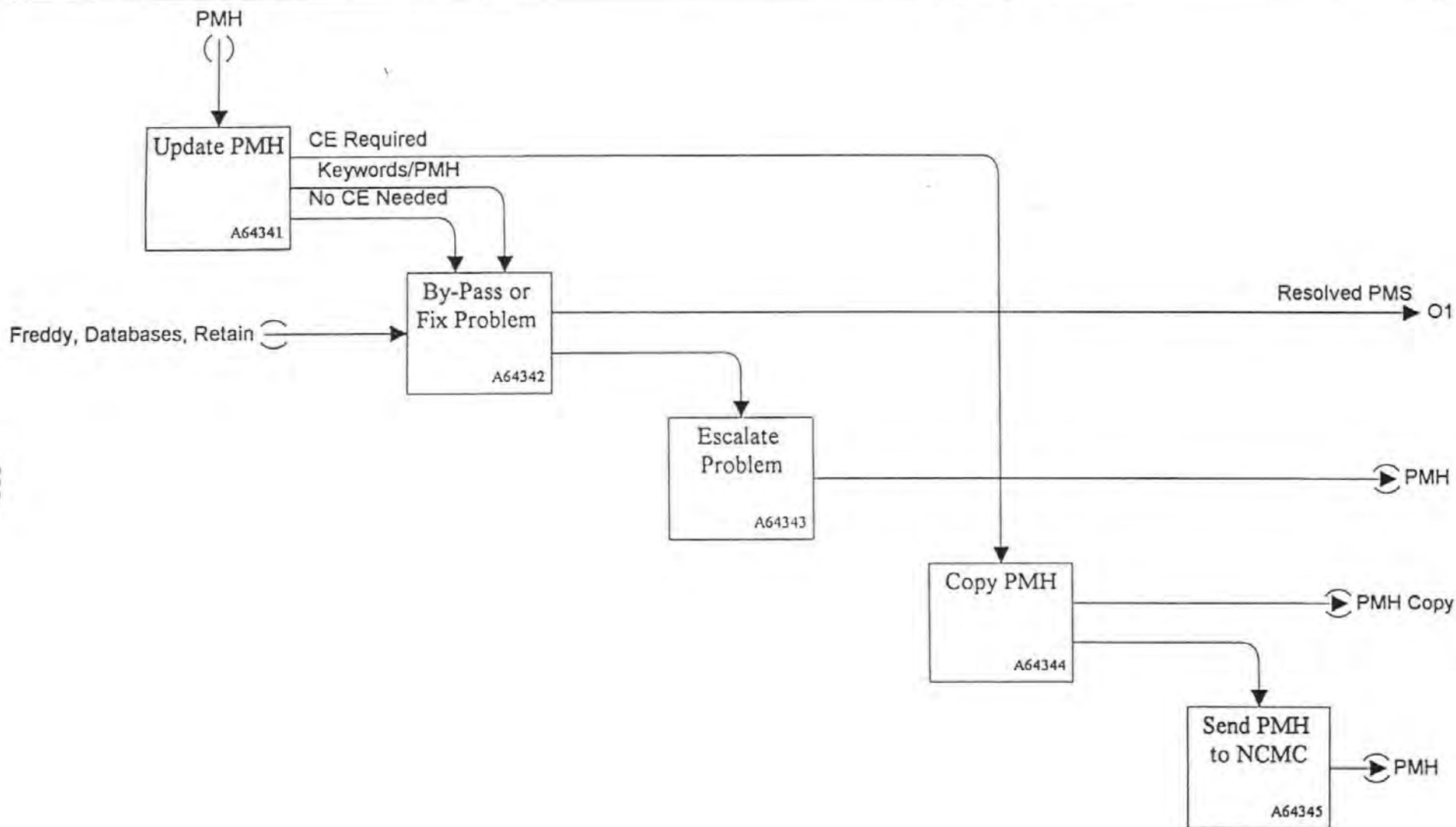
Specialist Teams (Level 2)



M1
Systems Team (32)

337





Escalate
O2

M1
H/W team

PMS (50 Calls/week)

H/W Highend PMH (20 Calls/week)

H/W Lowend PMH (30 Calls/week)

Need for CE

Resolve Problem

Copy of PMH

PMH

Resolved Problem O1

339

Rota ed Personnel

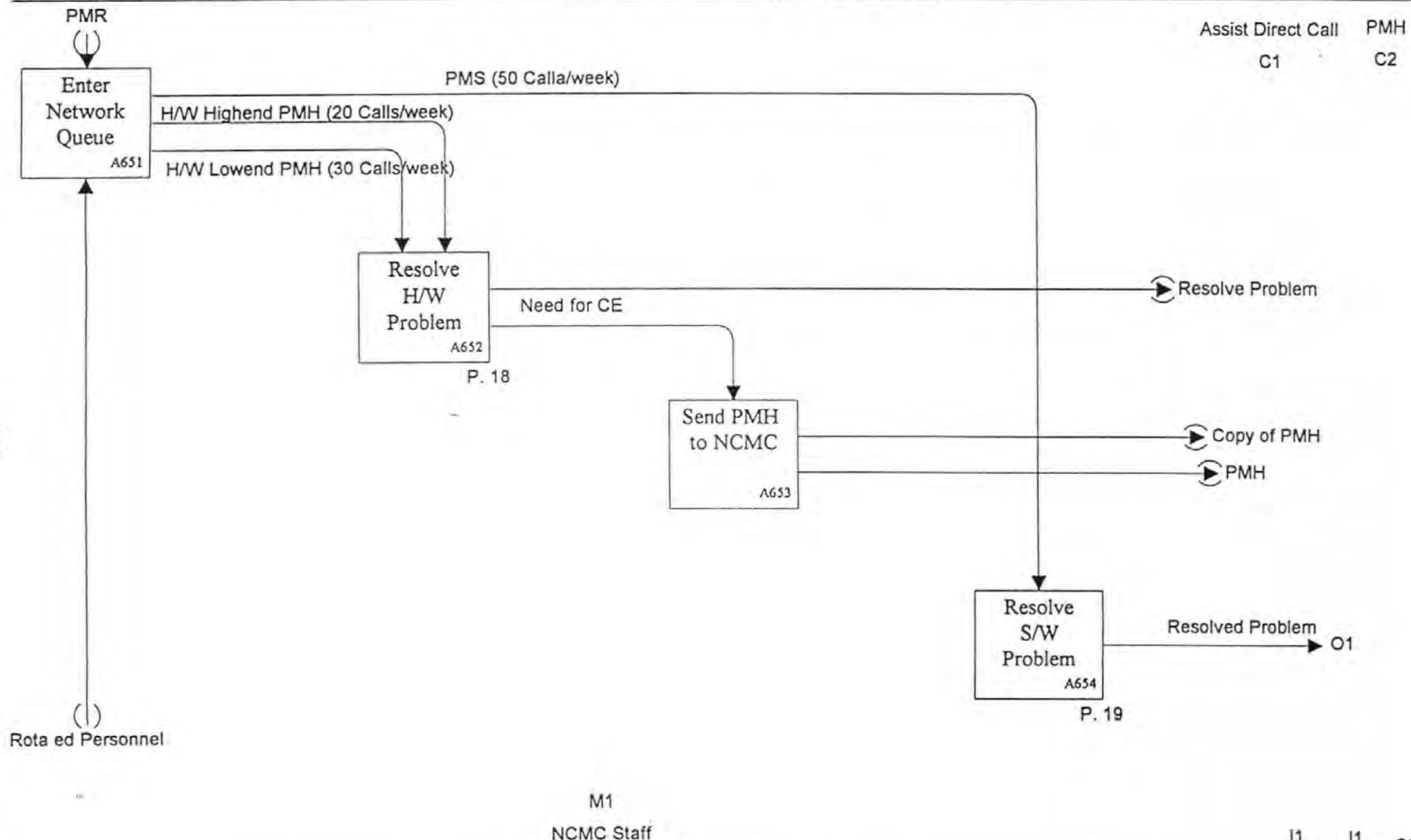
M1

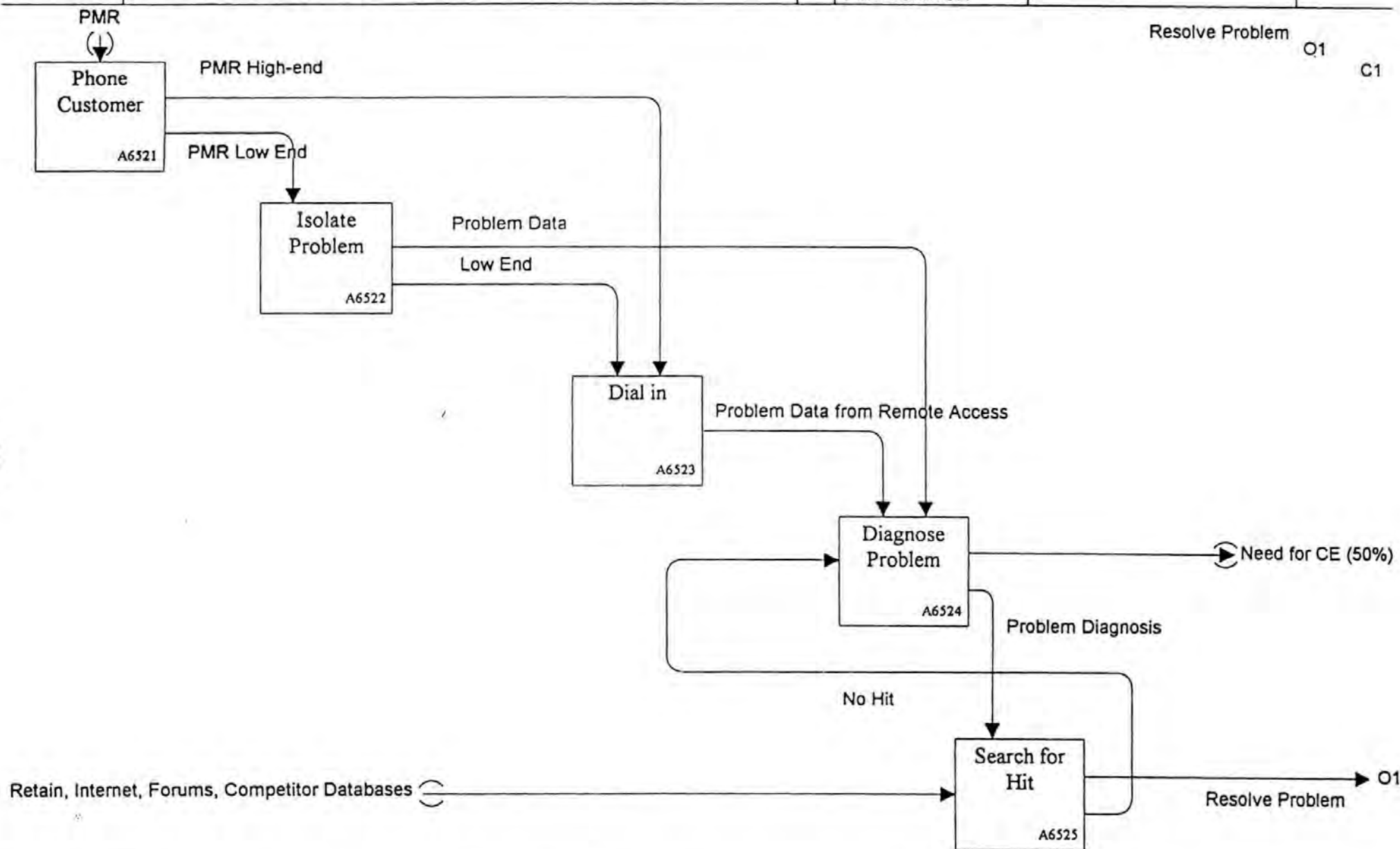
NCMC Staff

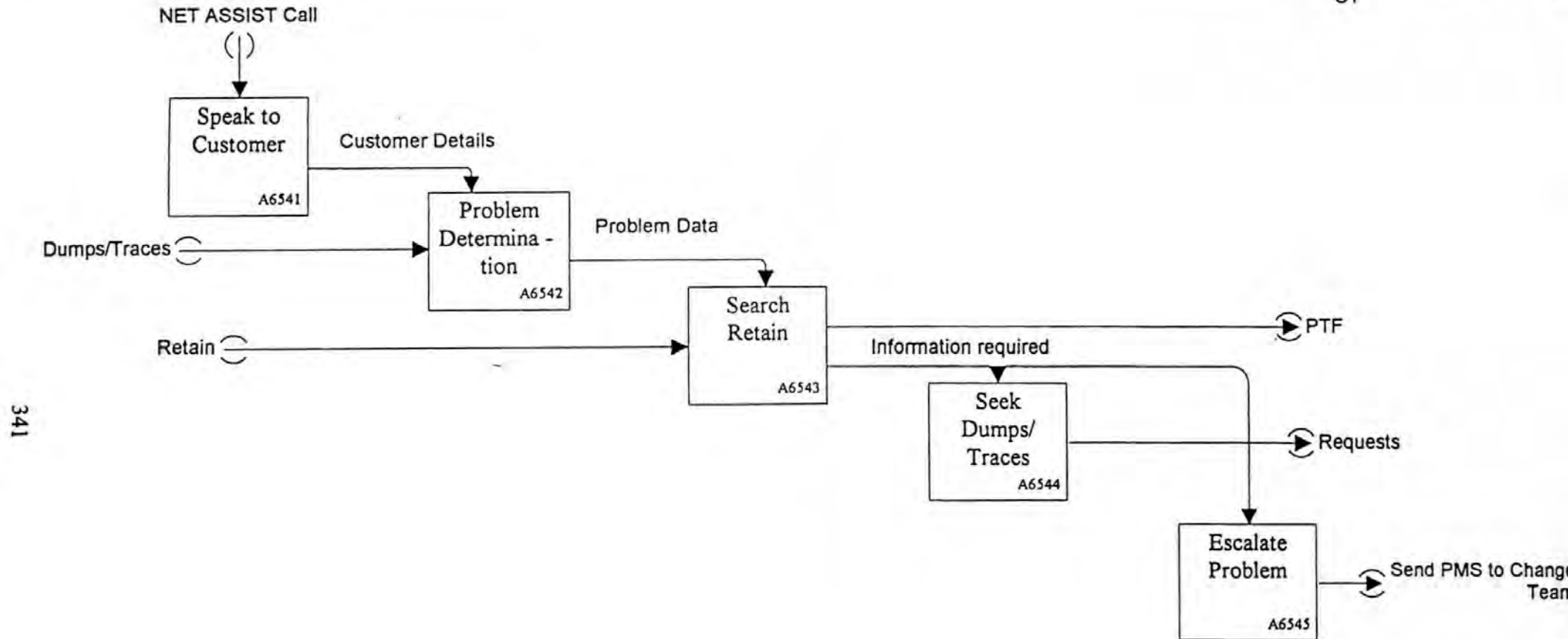
I1

I1

O2







APPENDIX 3

Services Development Project

Services Development Process Models and Explanation

The Services Development process is split into three phases. The process starts with a request from the bid manager for a new product or service. Phase one is then concerned with how a request for a new product or service is bought into being.

Phase two is monitoring and reviewing the product or service once it has been introduced. The main task in this phase is the task that manages out of line situations.

Phase three is concerned with managing the product or service to the end of its life. The phase starts with a request from the customer stating there is no longer a need for the product or service and it should be withdrawn.

Phase one within the service development involves several roles. The evaluator acknowledges the receipt of a request for a new service offering, they then seek to understand the customers requirements completely. The evaluator ensures that the request is feasible in respect of whether it is in line with IBM's strategic direction.

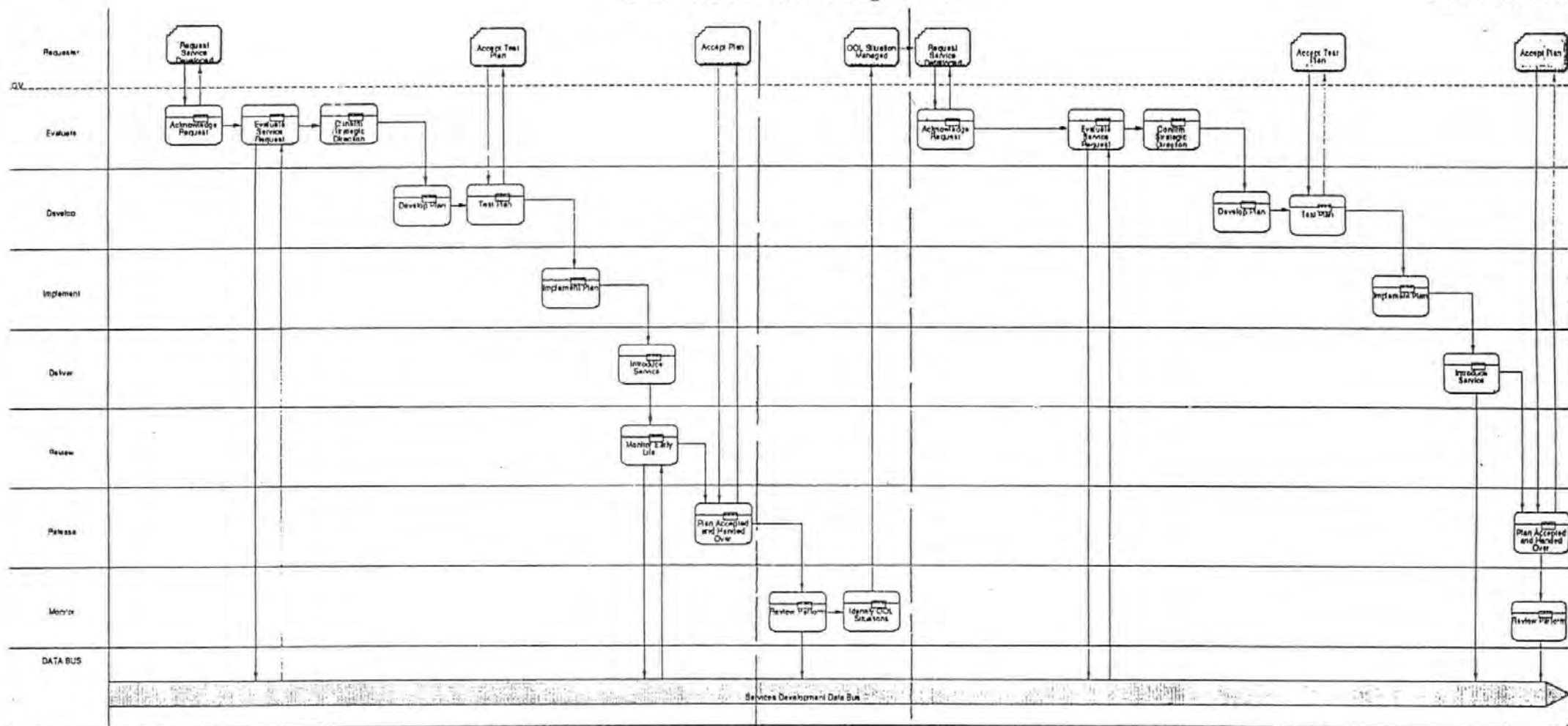
Once the service plan is accepted development of the plan commences, vendor requirements and business forecasts are collected. The plan is then tested with the customer to assure it meets the customer requirements. Once the service is implemented the plan is monitored, it is then verified and handed over to the customer.

Once the service is implemented the plan is monitored, then verified and handed over to the Phase two deals with monitoring and reviewing the service once it has been introduced. The main task in this phase is managing out of line situations i.e. where a service is making excessive profit, which could indicate that it is uncompetitive or where a service is making a loss and costing IBM more money to maintain than it collects in revenue.

Phase three is concerned with managing the product or service to the end of its life. The phase starts with a request from the customer stating there is no longer a need for the product or service and it should be withdrawn. This phase involves the same activities as phase one.

Services Development

Servsdev1

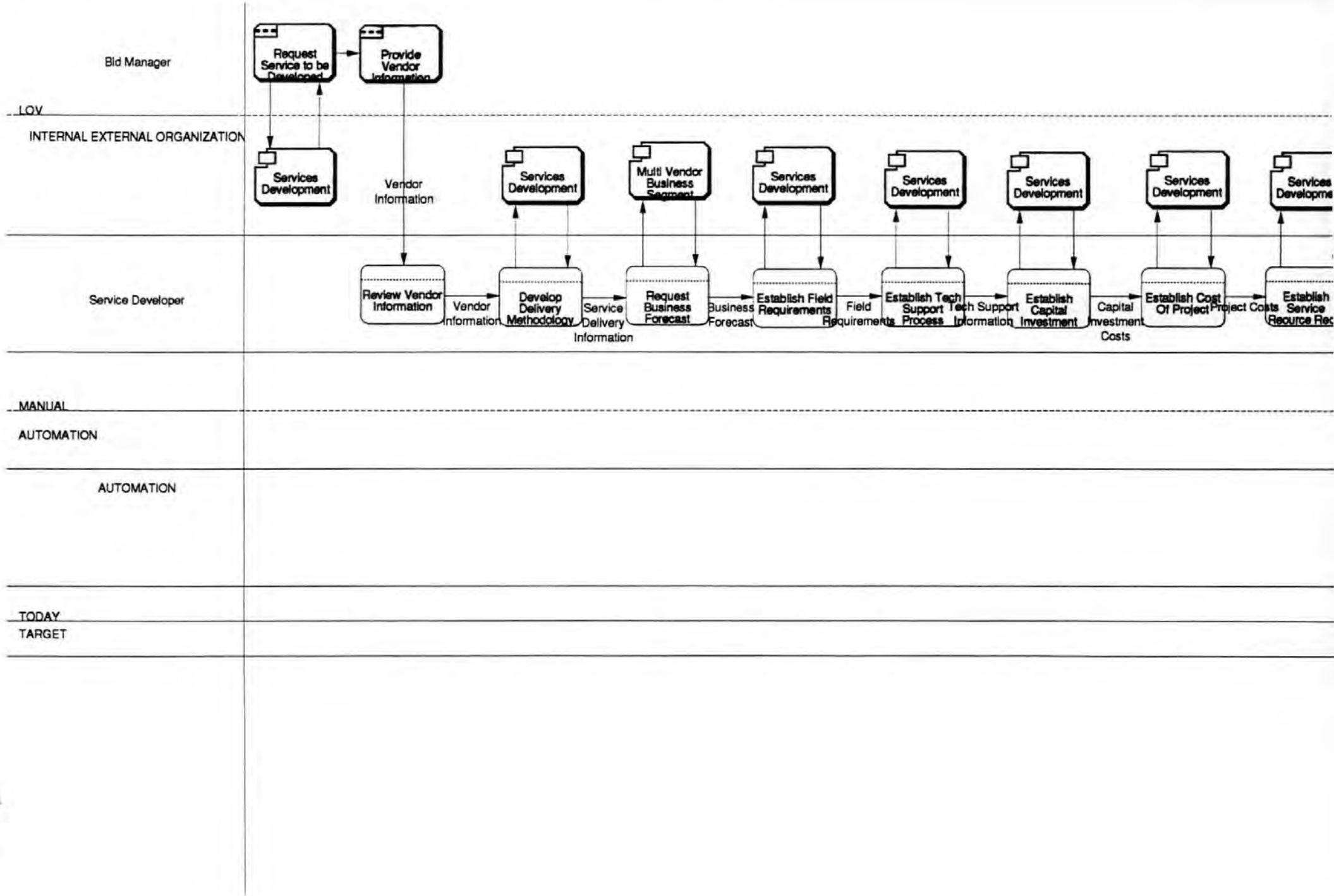


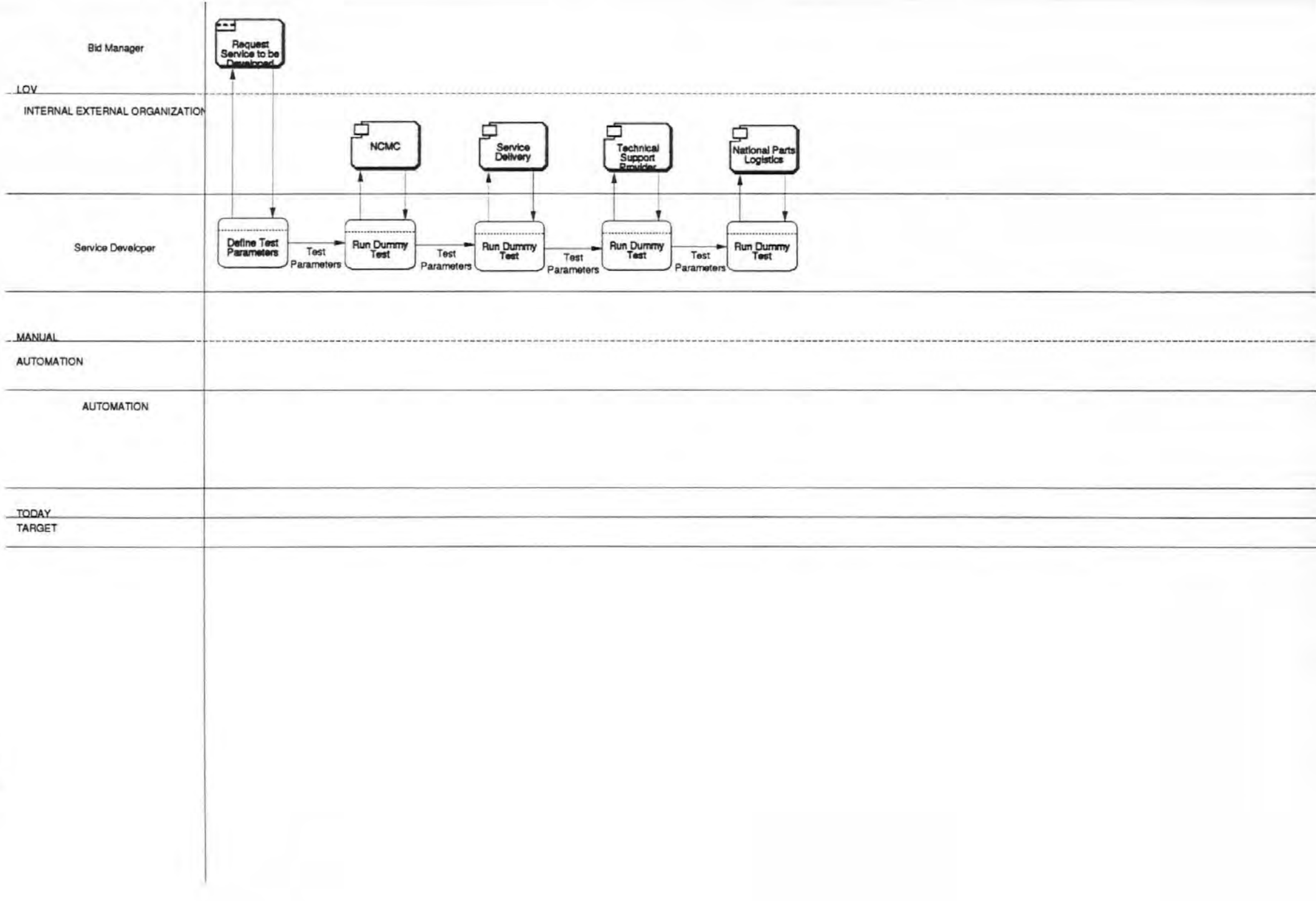
Phase 1

Phase 2

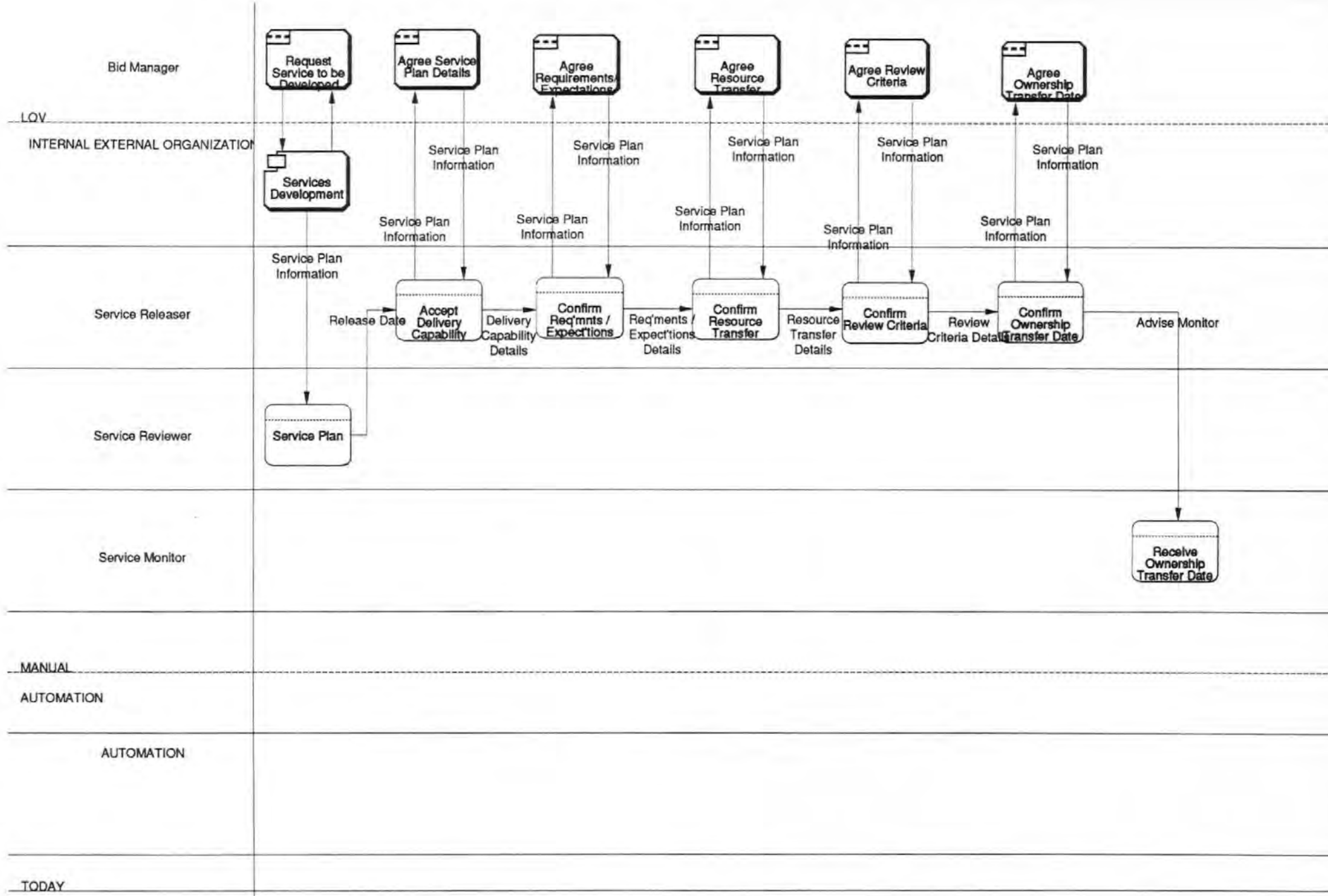
Phase 3

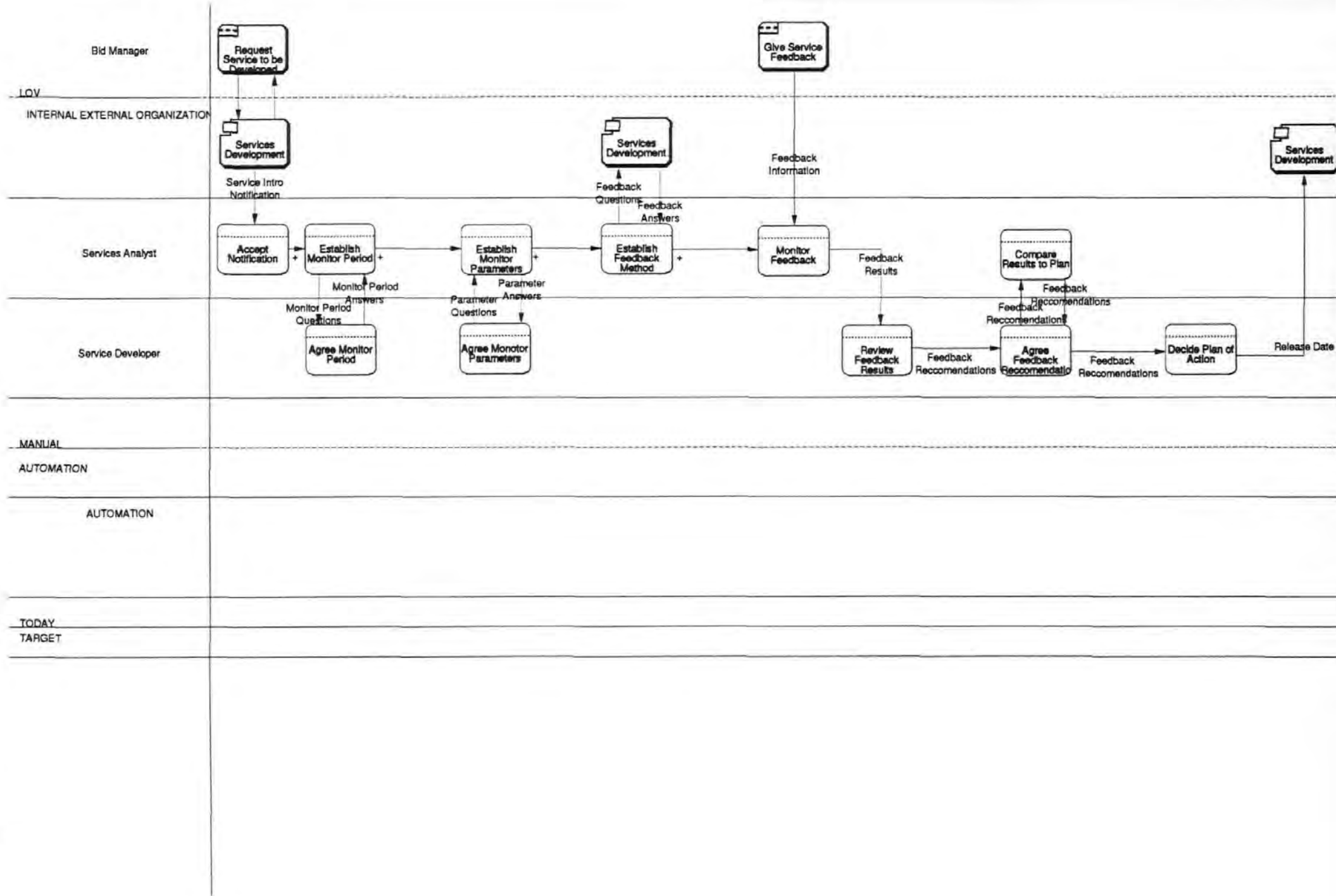
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APPENDIX 4

Transcripts

Transcripts from the Sponsors Semi-structured Interviews

Project One Central Support Services (CSS) Sponsor Interview

The sponsor is a senior manager who has worked in IBM for about 20 years. The sponsor was sponsor to the project but has since moved on to another area of IBM.

The sponsor clarified the fact that software professionals never fix problems, they pass information backwards and forwards to search for part time fixes. These professionals never actually install the solution or write the code that fixes the problem. It is possible that this role is less satisfying than the hardware role where the problem is diagnosed, installed and fixed.

As CSS is a very function based organisation it means that customer problems are viewed as either a hardware or a software problem. A percentage of mid range computer problems are a combination of hardware and software problems, but the customer cannot go through both routes at the same time i.e. first a customer may have to go up the hardware route and then go through the software route if the problem has not been solved.

The customer has been 'bred into this way of thinking, we say ring this number and the customer rings that number, otherwise they don't get support.'

The sponsor commented on the fact that there is too much change. IBM do not give changes a chance to produce the benefits they were intended to generate. An example of this is in customer account management. Service Specialist Representative (SSR's) look after the customers hardware requirements and the Operational Support Specialist (OSS) looks after the software requirements. It is intended that the SSR's will eventually take the responsibility for all customer requirements. The programme has only been implemented a year and already people coming up with alternative approaches. The sponsor noted that the change needs to be in place for a number of years before benefits begin to be produced.

The lack of ownership for the customer means that there are many hand-offs. The customer feels as if he is being passed around and not managed. 'Someone could handle all hardware, software and operational issues.

On the subject of project planning The sponsor said that 'we shouldn't re-engineer without high level sponsorship, otherwise people see it as change for changes sake.'

The sponsor said that the change in the director of PSS got in the way of the

project. The projects were stalled for 9 months whilst the director bought in his own management team and then 're-investigated' PSS. It was The sponsor's perception that after this 9 months the same projects began again.

The sponsor felt that slipping deadlines and missed actions was not just an IBM characteristic but a corporate trait. The sponsor said that corporations were not 'disciplined enough.'

The sponsor agreed that IBMers are not too aggrieved about not making actions. The sponsor said this was because project work is usually in addition to employees 'day jobs', therefore people do not have enough time to dedicate to project work. When actions etc are missed employees give the excuse of being too busy. The sponsor recommended that if a project is important that employees should be assigned to them full time.

The sponsor felt that it was an IBM trait to make meetings once a month. Meeting are rarely held once a week, therefore instead of 4 meetings taking 4 weeks they can take 4 months.

The sponsor talked about an example of a change which took place where two organisations were bought together. Due to the political nature of the change and the issues of people losing their jobs meant that the change took six months to implement.

The sponsor agreed that changes at IBM took a long time. The sponsor said that if a project has high level sponsorship, commitment and involvement then implementation would be considerably shorter. This sponsorship would mean that the project looks important within IBM and to customers.

Of the human factors finding The sponsor said that the first line managers were not bought-in to the project as none wanted to be that radical or outspoken. Some of the managers also viewed the project as an insult to their work, 'my department works OK, so why come and change it.' It was also noted that it is important to get the managers of the areas affected by the project involved. This project did not do this enough

The sponsor felt that the changes bought about by the new director of PSS meant that the long run process change projects such as ours, had to be shelved in favour of the short run tactical cost saving projects.

During the cost saving initiatives in order to save money some people were taken out. This meant that everybody had to work much harder and therefore had no time to re-engineer.

On the subject of process based changes the sponsor said that the work that had been carried out was mainly process improvements, not radical improvements. 'The core way that the process is dealt with hasn't changed, the technology they use has changed and some procedures. The sponsor said that these type of changes will not get IBM radical decreases in customer satisfaction and cost.

The sponsor noted that the CSS 'don't exploit intellectual capital we have'. For example there is much information on customer history, but no way to search this data.

The sponsor agreed that there is little documentation of processes, documentation that is usually found is mainly about procedures. There is also much information held in peoples head.

The sponsor said that there were very few measures available as people were unaware of how long it took to complete procedures and processes.

The sponsor noted that a key problem with re-engineering on a small scale was difficult to complete as it must be co-ordinated with the European and world-wide re-engineering initiatives. As re-engineering has to be done from the top down there is little freedom to continue with work until the European and world-wide business purpose is confirmed.

What worked with the project for the sponsor was the fact that the researchers were external to IBM. This meant we did not have an engineering or an IBM view of what was happening.

The sponsor had freedom to carry out improvement activities from the director of PSS, which he felt was good and useful. Although he also felt that he did not have the freedom to implement any changes.

What didn't work on the project was not having the right people in CSS committed to change. The sponsor said that in hindsight he would have formed a team who could have worked on the process changes full time.

The sponsor also felt that because some of the people in CSS had worked in the areas for a number of years that their views were bias. The sponsor also felt that the 'IBM machine' did not work for him. 'People talked about BPR, but that's all they did, talk'.

The sponsor also felt that the change in management in CSS did not work. The new manager wanted answers and solutions to the problems in the area, not what he could do in the long run.

The sponsor said there was a lack of project management disciplines, however the freedom that this gave us was advantageous, as we were not stifled to take actions.

The sponsor said that leadership of a project is extremely important. 'Someone has to be committed, have a vision and a desire to see the project through, otherwise the project will not happen. Generally this desire has to be for the good of the company rather than yourself as well'. The sponsor also said that leadership linked in with top management commitment, pre planning and project management. The sponsor agreed that planning a change was important, but he said it was also 'important for someone to drive the change, or no actions will ever be taken.'

The sponsor said he was very disappointed in the inability of the senior management committee to 'look at the broader picture' concerning his CSS project. The sponsor also felt that IBM were not 'breeding people who were visionary enough,' he said that 'IBM need more leaders who could identify changes and then go and make them happen.'

Project Two Teams Project Sponsor Interview

The sponsor has worked in IBM for over 10 years. He started out as a service engineer for IBM machines and is now a project manager. The sponsor was employed by the former sponsor of the Teamworking project to project manage the project from June 1996 to July 1997.

The sponsor said that he was given a finite time of a year by which it had to become self sustaining. The principle was that if the right people were involved teamworking would become part of the culture and would therefore not need any specific work and would only need a sponsor.

The sponsor talked about the rewards and recognition's being focused on the individual. He said that the introduction of Personal Business Commitments (PBC) was moving towards engendering team rewards and recognition's culture but at the moment PBC's are not being used as they are intended.

We need both individual and team recognition, but usually a person has excelled through the support of a team. There need to be flexible rewards for both teams and individuals. In the UK rewarding individuals is a social thing, in Canada rewards for teams is part of the culture anyway. UK culture is different, we should try and encourage professionals and manager to be more creative in way in which they give rewards.

IBMers by the nature of their jobs work alone e.g. CE's, what we don't realise that they may be working as part of a team in the customers environment. Salesmen are incented as individuals but they are going towards team quotas.

The individualism is also encouraged through the competitive environment that exists. 'You have your own career, you have to make the doors open and you have to look out for your self'. The 'culture is geared towards very high self motivation and the rewards and recognition that go with that'. IBM doesn't 'hold your hand all the time'. IBMers are extremely empowered and have much freedom.

People may not find it difficult to change to teamworking if 'their paymaster wants them to'. If there is a 'carrot and stick and the carrot is the wages, no the whole people will do the job they have been asked to do'.

Change is part of our culture, particularly 'too frequent change'. This has 'an adverse effect.' The 'problem with rapid change is people get away with things, because not time to implement solution. The effect of implementation cannot be measured before more change happens.

IBM are 'good at the up front stuff, but they don't give it time to develop and see what happens. In recent years there has been rapid change. In PSS things are stabilising a little. 'People expect change as a way of life in IBM, its just a bit too much at times.

'The constant change leads to constant confusion. The constant change also helps develop the individualism because you know that you will not always have the same career manager, therefore you manage it yourself'.

The constant change of managers significantly effect the success of projects. New managers bring with them new ideas and beliefs current projects may not be inline with these ideas, so they will be 'doomed to failure'.

Projects are very dependent on individual supporting sponsors. This should not be the case, because if work is important to the business it should happen, it should not be dependent on what motivates the supporting manager.

Sometimes, projects fail because of the fluid environment, by the time the change gets to be implemented the environment has changed and the project is no longer appropriate.

'Part of the problem with the project is that IBM is still in organisational silos. There is lots of duplication of effort and projects and at the moment there is noeasy way to see similar projects going on in other areas of IBM. There were at least 2 other teamworking projects occurring in IBM UK but they sunk without a trace. But if we'd been able to communicate, maybe they may not have sunk. Perhaps with Lotus Notes, we may be able to share this type of information'.

On the subject of the teams project being a fad The sponsor said that 'different initiative come and go and come round again and go. There are always the cynics who say they've seen it all before and almost will it to fail. Management project initiatives are almost viewed with suspicion, people are used to constant change and their used to a different initiative each year, there is a feeling of 'they didn't see the last change through, so why is this one going to be any different?'. People need to see this is criticle to the business, but it also has to be relevant to them. The required changes don't get translated into how the professional can actually do the changes.

'There was a perception problem with the teamworking project. It was perceived by some that teamworking was a stand alone thing on top of what they were already doing. What we were actually saying was that teamworking is an underlying behaviour, a way to work and how to relate to each other'. The project was seen as a discrete piece of work with a beginning and end point. We have a belief that PSS was a teamworking environment anyway. The difficulty was that it had a brand of teamworking, but the people thought we were trying to change not enhance this culture. Therefore the project 'got tarred with the fad brush, when in fact what we were trying to do wasn't that different to what we had already, it was just misunderstood'.

PSS teamworking was a co-operative environment already e.g. CE's by the nature of their job had to be co-operative to get the job done, they had to cover each others holiday and shifts.

The 'nature of PSS is fixing and helping customers and there is a camaraderie mentality to the job'.

The sponsor said that we were 'not sure if we fully understood how we wanted to change the culture, we know that teamworking was a good thing, but we didn't understand the existing culture, or the influence of the overall IBM culture'. The sponsor said that 'we could have been a bit naive by thinking we could change the culture. We had to change this small part of the culture, but this was part of a

bigger culture'. We needed to change the culture of PSS but PSS was with IBM culture, which has an over powering influence. The sponsor noted that 'some of what we were trying to influence lived in IBM not PSS.

On the subject of the role of the sponsor, The sponsor talked about the sponsor 'having an important role to act as a shield to protect teams from larger PSS'. The role of the sponsor in teamworking needed to be sufficiently committed to provide clout and a cocoon for the project.

The sponsor said there are many teamworking success stories, but these were in desecrate locations, plants. The difference with the teamworking project was 'we were trying to effect PSS, UK EMEA and we didn't have the degree of autonomy. This problem manifested itself as it 'always felt like a bottom up initiative, the drive didn't come from downwards'. The sponsor of the project was not always 'badgering' The sponsor and the management committee didn't seem interested in it. The sponsor said it 'almost felt like a project which had been inherited'.

The sponsor 'didn't have the drive or commitment to the project , which meant we were not as successful as we could have been'.

The project was split into several sub projects, as its not possible to 'eat an elephant in one go. We had to attack the teamworking in little bits'.

The sponsor felt that he 'should have got a project team set up straight away'. This didn't happen immediately as the project managers role was not clearly defined. Once the project team was formed, 'things started to happen'.

Forming a cross functional project team helped to 'get buy in from different parts of the organisation'. This type of team meant the project had a 'far better chance of succeeding'.

The senior management commitment was a criticle to the success of the project. The project 'need top management to cascade information down through the organisation'. This didn't happen. The sponsor said that 'like any project, you have people who sell the project and people who do the project'. The project was lacking people to sell it.

The project management system and team worked 'really well'. The project has 'a committed team who were all committed to the cause'. The team tool 'a fairly disciplined approach which got the project moving'. The project team did need some more support from their managers to carry out work on the project.

Not providing a replacement project manager at the 'focal point' was a big mistake. Canada learnt this lesson in their teamworking project, it resulted in the project never really recovering and eventually little pockets of local activity were all that occurred.

The Team Advisors Network (TAN) was a primary goal of the project. It was always understood that this would require some training. The project was hit my external factors such as expense constraints. It was difficult to find funding for something with was not core business and for something which meant money would be going outside IBM.

The training was good value for money, 'it was a shame we didn't have the foresight to ensure we had return on our investment'. The individual TA's have 'benefited from personal development from the training, PSS have seen some return, but no where near the full potential'.

The sponsor viewed the director of PSS asking for a business case so far into the project as a 'smoke screen' to stall the project.

There was little second line management commitment to the project as The sponsor perceived that they 'were scared to break rank'. The change of director had led to 'management by fear'. One member of second line management was needed to take the lead but they didn't. A 'leap of faith' was needed from the second line managers, but no one was prepared to 'put their energy behind what they wanted to happen'. The teams project was not on the 'usual business agenda, it was human stuff which could not have a direct measure on it'. The director of PSS 'was running a tight ship with very little room to Manoeuvre. Targets and goals were very clear and precise, so it was very difficult to deviate and be creative and imaginative.

There was a misconception with the managers that teamworking was about decreasing their role. There was a fear that teamworking 'was a means to streamline the first line management. The managers 'needed coaching so they could see the positive things about teamworking, such as allowing them to spend time on far more productive things and take a wider view of the operation'.

In hindsight a 'marketing person should have been employed to sell the project to the organisation'. The project was 'not communicated as well as it could have been and maybe an area where the project team we're not sufficiently skilled'. The senior management were good at communicating, but they didn't. The sponsor thought that we should have 'looked at the best ways to communicate. In IBM we almost have too many methods to communicate. We need one consistent approach to communicate. Now PSS has Reflections monthly magazine more relevant and readable communication is happening.

As the project was not seen as being on the business agenda it was difficult to justify the time of personnel who were working on the project. 'It was a demonstration of the individuals who did work on the project of their commitment, as those who were really committed found the time'.

The teams project 'cut across different parts of the PSS organisation. It touched each part of the organisation in a different way. As a consequence eggs were not always eggs and sometimes we were communicating at different levels which led to confusion'.

The sponsor compared the teams project to a supermarket he said it was like 'stocking the shelves with products and each manager could pick what they wanted off the shelves, but they had to take something'. The problem was that nobody was 'forcing the managers to unitise the teams projects services'. The implementation of this kind of practice needs the hands on control of a senior manager enforcing the use of team resources to 'get the ball rolling'. This project had no enforcement so the 'teams challenge was not taken up'.

The sponsor said that it was useful having a 'working model of a similar teams

project from Canada. Their culture was similar to ours, such as a geographically dispersed teams. We were able to learn lessons from them and could use them as a point of reference as they were 2 - 3 years ahead of us'.

As we shared best practice we were able to directly import the model of TAN and training for this into the UK from Canada. 'We didn't need to reinvent the wheel'.

The project team worked very well as they were all committed. The team was also helpful in confirming that the project is going in the right direction. 'As the project was dealing with something which was intangible, it helped to discuss ideas with like minded people'. 'Of those people who were genuinely supportive there was a feeling of we can make a difference and we can make it happen'.

The project was successful in as much as 'we actually achieved as much as we could within our sphere of influence e.g. the network was set up and started to operate.

'The SDBI team was a good example of a team that could achieve a lot once supported and motivated. We were a geographically dispersed team that felt like a co-located team'.

The sponsor said that some of the major 'things' that didn't work in the project were 'not forming a project team at the outset of the project. Not being harder on the sponsor to get involved and be more committed. Not being able to get the director of PSS committed to the project. Not reaping the rewards from the investment we made in training. Placing too high expectation of how much TA's could influence'.

The sponsor felt that if we had been able to get the training done in the time before the management changes then 'we could have exploited the second line managers power more'.

It was also unfortunate that IBM has limited resource. The sponsor said that to try and make a large organisation change there needs to be a bigger investment.

Overall The sponsor said there needed to be 'more heads focused on the project, it needed higher visibility, it needed to be seen as important and it required sponsorship from the director of PSS'.

Project Three
Services Development Project
Team Facilitator and New Manager (in place of the Sponsor)

The facilitator has worked at IBM for over 25 years. He has a wealth of experience and insights into the working of PSS. For the last five years The facilitator has worked in the Quality and Process Improvement area. The facilitator was a member of the Business Improvement Team (BIT) and was mentor to the researcher.

The sponsor of the Services Development project left IBM in January 1997. The facilitator worked closely with the sponsor and was also facilitator to the steering committee. The facilitator was interviewed about the data collected and the findings of the Services Development project instead of the sponsor.

Of the cultural issues facing the project The facilitator said that because the technology requirements were not signed off and implemented people 'chose to work in the old way; the way they were comfortable and happy with.

The facilitator agreed that the sponsor did not consider the alternative solutions to improving the efficiency of his department. In addition he was given a solution of LOVEM process modelling tool before all aspects of the problem were known.

The BIT had been trained in LOVEM. The facilitator perceived that they 'had the theory and the solution (LOVEM) and they just needed to find a problem and area to practice on. The facilitator sold the LOVEM idea to the sponsor which happened to coincide with his own thinking on quality, teaming and process changes. The sponsor felt that LOVEM would be the ideal way to tackle some of the changes going on in the organisation.

The facilitator said that the project 'was an experiment' in respect of using LOVEM.

The facilitator said that the project should have got everybody who was effected by the project involved; 'need to get all relevant people involved'. In particularly The facilitator said that 'some people were not involved in its design, because they were not involved in design, they decide not to use it'.

It was felt that the sponsor should have got more actively involved in the project; he should have 'walked the talk' more. Although, the sponsor had other business pressures.

It was also suggested that and instead of giving an open invitation for people to get involved the sponsor should have led the group and insisted people get involved and are only given the option to decide when. The project 'possibly required management to be more proactive.'

The facilitator explained that Services Development people come from different backgrounds and different companies e.g. AMDAHL, DEC. Therefore they were all accustomed to different corporate cultures. An example of how this situation manifested itself was, one of the member of the team was used to being a specialist, therefore working in a team was alien situation and he found it very difficult and so was very quiet.

The facilitator said that from working with a diverse team he had learnt the 'need to understand individuals driving forces. We don't give enough time to investigate and have the discussions about what in it for the individual. We tend to think about it in terms of the organisation.'

The facilitator thought that the project tailed off; 'there was lots of motivation at the start and less at the end'. The project aimed for 'quick wins' throughout the project, The facilitator described this as 'implementing as you go'.

It was discussed that Services Development is very function based. The processes that were being examined were limited to the part of the process in Services Development. The interactions with other functions were not examined; the team 'didn't think about interfaces outside Services Development and they didn't get other functions bought in'. The different functions 'spoke a different language'.

On the subject of project planning and management, The facilitator said that 'a representative from each of the platforms considered to cover all areas of the business which would be effected by the changes were chosen'.

The steering committee thought it was very valuable having two facilitators.

The facilitator felt that the project was not scoped out enough, 'all the requirements for the future were not known'. As a consequence sign off which were required were not understood early and where not signed off. As the project was not scoped out in the beginning there was not one consistent view of where the project was. Nobody else in the department could see where the project was as there was no formal method of keeping people up to date. Those not involved with the project were not so brought in as there were no communications to 'look at'.

The facilitator said that if 'a PDW and PDR had been held then the project may have been continued'. It was suggested that holding a PDW and PDR would ensure that the project had a valid business reason to be done. It would then be much more difficult to stop the project. When the risks of the project are defined a change in sponsor and management should be noted. Contingency plans could then be set out, such as bringing the new sponsor up to date and bought into the project. 'This never happened with this project'.

The facilitator felt there was a lack of publicity. The sponsor 'should have cascaded information up and down the organisation' more. There was no regular project report which could be distributed to all those effected.

The facilitator thought that the 'fundamental element that was missed out was the PDW and understanding the scope of the project.'

The models created during the project were all PC based, so it was not possible to give demonstrations of the applications potential.

Travel restrictions placed on PSS meant that the steering committee could not go on a LOVEM course. As a consequence 'in-house training from the facilitators' was the only training available. The LOVEM software could not be installed on the steering committees PC's which meant that the facilitators could not do a LOVEM tutorial.

The facilitator said that the steering committee 'tailored LOVEM to their requirements'.

The facilitator felt that as the facilitator he led the team to start with then the team drove the project, with the facilitators taking a supporting, encouraging role. The facilitators had to ensure that the team thought of the process as theirs, not the facilitators.

The team were given the opportunity to redesign their process but The facilitator felt that they just kept slipping back to their current situation. This led to process mapping not re-engineering. The 'hardware and software processes were quite well documented therefore it was difficult for them to shift their thinking'.

The facilitator said that 'the processes, in particular the flows between activities were never really described in detail, as they were not understood'. Cycle times were definitely not known.

The team did not get around to inputting measurements to the system, but they were going to be 'what happened in reality i.e. days, a common sense practical approach was going to be taken'.

It was felt that the teamworking aspect of the project was very good. The facilitator said that 'lots of new people were brought together, some of these people were anti, but they got brought in'.

'The process diagrams were put on the LAN, but they were never access because people didn't know how to and they didn't know the diagrams were there due to lack of publicity. The models were eventually removed from the LAN as they were not accessed'.

The facilitator said that 'a change in management led to a change in focus away from the project.' The sponsor left suddenly when the director of PSS bought in his new management team. The new director had more emphasis on revenue and measurements rather than teamworking and BPR.

The mission of the department changed slightly during the project, therefore there was 'confusion about who should be involved in the project'.

The sponsor left the company and the new sponsors 'interests lay elsewhere'.

The facilitator also pointed out that the facilitators also had a change in management. The new manager wanted the facilitators to work on different projects.

The resources and time required to dedicate to the project was quite 'a lot'. Resource constraints were quite tight.

Transcripts from the Semi-structured Interviews

IBM Second Line Manager

The manager is a first line manager in PSS. He has worked for IBM for over 25 years. The manager has a particular interest in managing change.

On the subject of project planning The manager's view was that, generally in PSS managers 'see a problem, but they don't analyse it, they just attack the symptom and not the cause'. The 'repercussions upstream and downstream' do not tend to be looked at.

The manager said that PSS is full of 'solutioning'; it is a solutioning culture. As the main base of PSS are customer engineers this kind of 'Mr fix it' 'solutioning' culture has developed.

The manager perceives that there are 'lots of 'in the bath thinking' or 'eureka' thinking ideas i.e. come up with an idea and don't spend time thinking up alternatives'.

'PSS are tactical planners not strategic planners' therefore PSS does not 'plan properly in the long run'. There are no long run strategies 'which make it difficult for managers who have ideas to check they match future strategies'. PSS does not tend to take a 'broad view' of a problem. The 'short run strategy focus' is not a PSS 'thing', therefore it 'must be the IBM culture, always going for the short run gain'.

It was discussed that not much time is spent in the 'diagnostic' phase. The manager said that 'we should spend time thinking through the problem, but being the culture that we are we start out straight away'. PSS's culture is one of 'get on with it'. Much analysis and diagnostics and thinking about the problem is not viewed as valuable. Little analysis leads to rework, which leads to 'cyclical repetitions' of the problem. The manager illustrated this in figure 32. 'IBM has a work hard play hard culture, which leads to a getting things done 'Macho' culture'. The manager thinks that IBM is trying to move to a process culture.

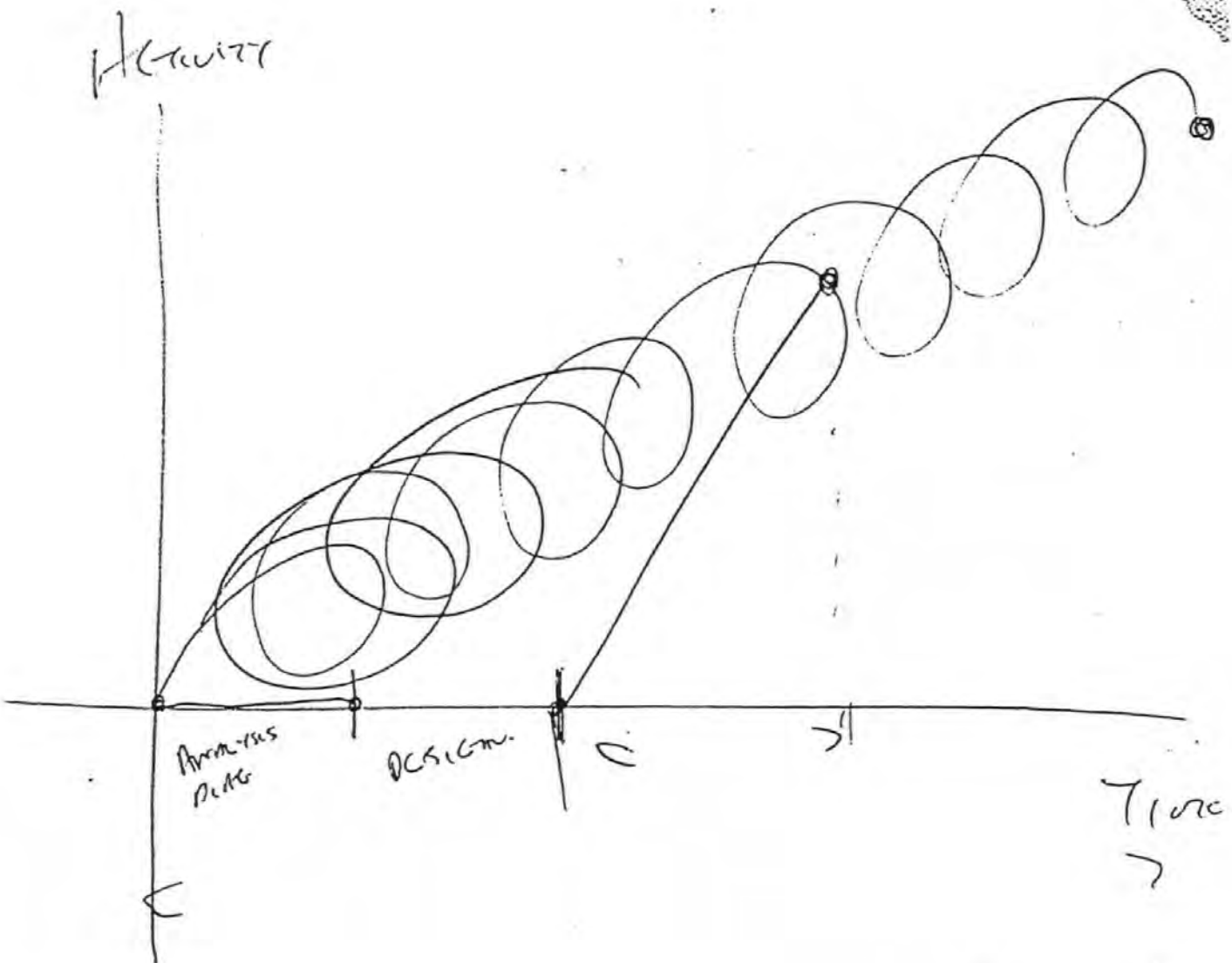


Figure 32: 'Cyclical repetitions'

There are 'no repercussions for failure'. The culture is perceived as one of 'fear' but there is no evidence for it. IBMers often feel that if they don't meet their targets they will lose their jobs, but this never actually happens. There is still this fear though, which probably came from the 'down sizing exercise of a few years ago'.

The manager discussed the fact that many customer engineers come from 'the services' and the post office. This meant that they were very used to a hierarchical environment. PSS has started to change the culture by bringing in non PSS managers. However these managers were not brought in at all levels of management, so it has taken a long time to change the environment away from hierarchies.

Of project management The manager said there are 'lots of little projects going on and little co-ordination of them'.

In a discussion about project planning and management The manager said that 'actions are carried forward as people don't recognise the consequences of not completing actions'. The manager thought that perhaps if the project team worked together more closely that they would may be more responsible for their actions as they would be able to see the effect of not completing an action on their fellow team mates.

The manager said that communications in IBM were 'noss note' based and once managers have sent a note they think they have communicated. In reality all that has happened is a note has been sent which may or may not have been read. IBMer 'forget to use the telephone'. IBM also think that by putting an article in an IBM publication that everybody will understand and be bought into the subject.

The manager felt that project managers required more softer skills such as team working, leadership and how to get people bought-in.

The manager also thought that the leader should be the same person throughout the life of a project as often as possible.

The manager strongly felt there is a need for more accountability. The manager pointed out that sponsors in IBM were often 'not responsible enough'. There are often no formal responsibilities agreed, therefore sponsors do not have to accept responsibilities and accountabilities if they do not want to.

The manager noted that IBM does not make any effort or give anytime to understand what drives professionals personally. The manager says that if you don't understand this then IBM may try to motivate people in the wrong way.

For top management commitment the manager says you 'need emotional commitment'.

On teams the manager said that one problem that teamworking in PSS faces is that it 'has a large geographical spread which means it is hard to maintain and create a teamworking environment'.

Teamworking is 'difficult to encourage as there is not the finance available for team events or rewards'. There are also lots of constraints on resource, people do not

have enough time to dedicate to teamworking. Often it is difficult to 'get a team physically together often enough'.

The manager also perceived that PSS is skeptical of teamworking. Many of the measurements were based on individual performance not on teams. The manager said that you 'need to change the measurement process to change the culture'.

IBM Project Manager

The interviewee is a project manager, who is heavily involved in process change initiatives occurring in PSS. The project manager has worked in PSS for ten years and has a very good knowledge of the projects the researcher had been involved in. In addition the project manager has a very detailed knowledge of PSS and its history.

The interview took the form of an informal discussion. The discussion focused on the findings of each case study. The finding that had been written up were gone through, considered, developed and elaborated on. The meeting took about three hours in total.

From the cultural findings of case study one the fact that IBM had a tendency to specialise 'in things' e.g. IBM separate their business by functions, such as AS400 and AIX businesses was discussed.

The project manager thinks that the hardware and software businesses are particularly separated which leads to problems if it is uncertain whether a problem is a hardware or software issue, as the problem may get 'ping ponged' between hardware and software centres. The project manager also had the perception that no one has an overall view of the two centres.

The project manager felt that case study one had 'powerful and influential' leadership. However, the leader should have communicated the project more.

The project manager thought that the project may not have been thought of as having a high priority as 'continuous improvement activities are always seen as secondary to fire-fighting which comes first'.

The project manager felt that the goals of the project were not clearly defined. This became evident when the researchers had to check with the sponsor what the goals and boundary of the project were.

The project manager also thought that for a project to be an official project, it should have its own stand alone management system, with mission, objectives and goals assigned. Unless this is completed the it is a piece of work that is being carried out, not a project. Case study two did not have a project manager, a project definition workshop (PDW) or authority in the organisation. The project manager did not think case study one could be labelled a project.

It is evident that much work is started and never completed because of new organisational change which takes over. The project manager suggested that holding a PDW could help make an assessment of how important the project is and therefore how likely it is to be continued during an organisational change.

Sponsorship was discussed as being essential to bring inspirational and motivational leadership. In IBM there were problems where the 'title' of sponsor was taken but the responsibilities that go with it were not. The project manager thought that there were problems on the projects where sponsors did not get involved e.g. sponsor not attending kick off meetings. The project manager felt that the first sponsor of this project was quite actively involved.

The project manager said that the 'perception about the part-time contract

workforce is that they are not as skilled as IBM workforce. The NCMC are perceived as not requiring skilled workers.'

In the case studies that suffered major changes. The project manager said that 'if one person had been responsible for the project, such as a project manager, they should have spoken to the new manager to get his commitment to the project.'

It was discussed whether the case study was looking at process based change. It was decided that it was boundary crossing, operational processes which were being researched.

How much of the process should be documented was discussed. The project manager felt that if too much process documentation and mapping takes place it may effect employees moral and motivation.

The project manager thought there were more process cycle times available than had been noted, particularly from 5ups measurements.

The project manager said that modelling tool that is used should 'depend on what you're trying to represent.'

The project manager thought that the number of change projects that had occurred in the CSS was due to a 'leadership problem'. One manager liked Vanguard consultants and one manager liked Coopers and Lybrand consultants which led to a clash of conflict interests. The project manager also thought that this problem meant that there was no clear strategy for process changes and no clear management in CSS.

For the Teams Project the project manager thought that there was still an individualistic culture which meant it was difficult to change to a teams culture. The project manager said that 'the way you progress is up to you individually, therefore you have to sell yourself.' It was also noted that there was a need to change the pay and rewards structure to support teams not individuals.

The project manager thought that the benefits that teamworking would offer PSS specifically were poorly communicated.

The project manager was not sure whether the goals of the project were clearly defined.

The project manager's said that 'teamworking was a different concept for managers to undertake and they needed more to persuade them to buy into the concept'.

The project manager thought that some of the working practices had changed as a result of the teamworking project. There is evidence of engineering starting to look at their processes.

Of case study two (Services Development) The project manager said that 'perhaps the sponsor should have looked at doing a feasibility study to look at other choices'. The project manager felt that perhaps the idea for the services development project was not thought through.

It was said the project was successful in getting people who were not knowledgeable in LOVEM process modelling tool to use it.

It was discussed that the overall problem of the project was that too little time was spent on planning and thinking the problem through. Whether this was a 'western thing' or an 'IBM thing' was unsure.

The project manager thought that the sponsor should have considered how his idea for a project would fit into the overall strategy of PSS for technical, financial and process changes. It was thought that perhaps a more 'holistic' approach to looking at the problem should be taken.

It was considered that perhaps the motivation of the sponsor was not to improve the PSS business but to improve the Services Development business.

Overall it was felt that there is much analysis and design but little implementation. The project manager said that some people in IBM think that issuing memos will implement new processes'.

The project manager said that implementation was about how to get people to change. 'IBM don't allow enough time to allow people to change to lasting change.'

The project manager also said that there was a leadership problem. 'There were not enough people out there walking the talk'.

The project manager thought there was an issue with not getting employees involved in change. PSS did not get enough people involved and particularly not the 'critical mass' (those crucial to the change).

Essentially The project manager said in IBM the 'human side of change was missing'.

PSS Transaction and Solution Design Manager

The manager have worked in IBM for many years. He has a vast amount of experience of working with IBM's largest banking customers. The manager speaks from a customer orientated point of view.

The manager talks often about issue management verses exception management. Issue management is much like fire fighting i.e. constantly dealing with the problems to hand and not doing much thinking ahead and long term strategic thinking. The manager said that IBMers like issue management as they get a 'feel good factor' from fixing problems immediately. There is very little thinking 'about why you have that problem'. The manager says that issue management is not good engineering practice, so it is strange that IBM has this type of behaviour as they are founded by engineers. The manager thinks that IBM should do more exceptions management and go back to think about the 'fundamentals'.

'Fixing culture is very IBM' and is preferred because it is an instant fix rather than exception management which may take several days to sort out and then another few days to pursued others to commit to the ideas. IBM to not realise that exception management will actually save time in the long run.

The issue management and the fire fighting both link into IBMs tactical focus. This short run tactical focus has meant that 'much of the work that we are doing at the moment has been done before'. The problems are fixed quickly, but never actually implemented completely. PSS has a break fix syndrome.

IBM has a mentality of they 'do not have time to do exception management'.

Of process re-engineering The manager said that there are standard world-wide processes defined. People often think that they have to design processes specifically for there part of the organisation. The manager says that what they don't realise is that what they have to is take the basic process design that has been provided and design specific procedures, practices and disciplines. The processes just need 'tuning'.

Process re-engineering needs enforcing at the outset before it leads to a democracy.

IBM causes confusion in its process work because the same projects, processes are called different names each time they are reintroduced. There is a need for consistency of information, job and roles.

Of sponsorship The manager said that there is a requirement to have a sponsor from the 'line', the higher the management the better. The sponsor can not be from the 'staff' as they must have the power to influence and enforce. The manager also says that because of the high level we require the sponsor to come from we cannot expect them to be involved in the detail of the project.

Below the sponsor an evangelist or believer is required to drive the project and to drive the sponsor to tell him what to say and what will happen. The manager says that keeping the same sponsor is difficult across the life of the project as IBM change their people so often.

The manager says that IBM is in a 'constant state of change and flux'. To add to the complexity of change 'we keep changing the words that are used for the same work' so people think they are doing something completely different which causes confusion. For example people don't realise that they should be improving on the process architecture that's already in place, they think they should design their own process.

IBM find it difficult to have flexible skill and resource to have the right person in the job at the right time. This is because the 'physical organisation is always a compromise'. There is a 'it's not my job syndrome' which means that even if someone has the appropriate skills they will not do the role as it is not there job.

IBM has a large amount of change this means that the people who were carrying out the original change lose their credibility when a new change is introduced.

The constant environment of change means that IBM are 'moving onwards, but not as quickly as one would like'.

The manager says that 'process change takes a long time and in the end we all know that in November there will be a big revenue push'. 'Change takes years to become self sustaining'.

On the subject of teamworking The manager commented that teamworking in IBM means 'getting individuals to belong to the whole and the whole is very big and individuals don't like belonging to a big team'. The manager commented that 'some small project teams worked very well. But they become insular and do not achieve all their objectives'.

The manager discussed the fact that IBM need one incentive and management system which does not drive people to be selfish. IBM comes from a very selfish individualistic culture. The manager said that process change is required before IBM can get an incentive scheme that every one is rewarded fairly.

If The manager were to improve implementation in IBM, he would build ability to change into projects which are planned. The manager says this is essential as change can knock a project sideways e.g. the growth of PC's knocked IBM 110% over a period of just three years, which is very fast change in a short space of time. 'Change happens, but people design for what they know about today, they don't design for change'. In fact, people put penalties in contracts if changes occur. But, requirements change, everything develops. The manager believes that after six months every contract should have a redirection or decision point or non returnable milestone built into it. This would mean that the project can be evaluated and decisions can be made on whether the original starting place is now appropriate, whether the original requirements are still relevant.

This approach is difficult to agree, because it means constantly changing contracts and re-negotiating. The manager believes that we need to appreciate that 'ideas will change'. IBM needs to appreciate and understand this and take time to trust and work together to develop ideas, scope and requirements.

The manager talked about the best project he has worked on and quoted the manager of Lloyds as saying 'we wrote a contract that made it very easy for either party to walk away from, as a consequence we've never been so close together'.

The manager said that it was natural for them to work together to define what was required. As a consequence credibility was extremely high.

The manager says that the 'IT industry is moving so fast there will always be change'. 'IBM need to manage for change'.

The manager explained his concept of a 'Contract of Understanding' (COU). This is a document which encourages IBM and the customer to understand what each of their interpretations of the requirements actually means. It is a way to gain an understanding of each others views, and then come to a common consensus of what the scope, term and conditions, liabilities, limitations of the agreement. This document could also be used to give the project a purpose to continue if some unexpected changes threaten to put the project on hold.

The manager says it is important to know the 'limits of what we are going to work within and then you need to know how we're going to do it'. Thinking about the terms and conditions of the project encourage thinking through what human interactions are required to complete the terms and conditions that have been agreed.

The manager also says it is important to do risk assessment to remove as many 'what ifs' and uncertainties. If as many uncertainties as possible are removed or identified then deadlines may not slip.

The manager says it is the constant change and changing requirements which mean that the timescales are never met. If we constantly focus on expectations and requirements then timescales can be re-addressed and timescales may no longer slip.

Transcripts from the Focus Groups

Focus Group 1 - 15th October 1997 9:30 - 12:30pm

Agenda:

- Introductions and administration
- Brief overview of my research over the last two years.
- Facilitated discussion section.

The facilitated session was run by asking the participants to think about the following question:

'Think of two process based change projects, one successful and one unsuccessful. For each project consider what worked, what didn't work and what could have been done differently'.

Discussion

The main points that were discussed at the workshop were captured on a series of flip charts. The full workshop has been recorded on tape for future records.

It was said that one project 'was not successfully completed as the sponsors vision was not interpreted in a meaningful way or may not have been articulated effectively'. There were also the problem of 'management leaving and changing' during the life of the project.

It was also noted that the project worked well in its early stages, 'people got involved' for example. Unfortunately the 'size of the project was not understood'. The scale of the IT systems development required and the sign off was not understood. The project produced many 'reference models, not working models, which is what we do at IBM'. Essentially there 'was not enough scoping the project out' and there was not the 'resource to understand the scope properly'.

In another project 'nothing changed' the project 'helped to describe what the problem was' but not much more. There was a 'lack of sponsorship at the right level' in this project. The sponsor of the project was 'lost' during the project and in other projects the sponsor 'changed'.

It was discussed that the similar projects are repeated over time but are given different titles. It was also said that projects are not normally rolled out, all the preliminary work is carried out, but the roll out rarely occurs.

The communication process is sometimes lacking, in one project the 'idea was not articulated clearly either up to the managers or down to the staff'. It was also discussed that the politics of changes are often complicated.

Amongst factors that worked in the projects team dynamics and not being emotionally engaged were noted. Factors that didn't work included not having customers enveloped and not understanding requirements. It was said that in future projects more effort would be made to understand requirements and keep emotionally detached from the project.

On the subject of the culture of PSS it was said that people in PSS love to 'design,

but are very poor at the roll out piece'. The culture is very 'creative' but at the same time quite blinkered in its approach to change i.e. there is little looking at the 'wider view' of a change. It was also said that sponsorship is poor, as it does not force through roll out.

In one project the factors that worked included, as high level of sponsorship, a tight time scale of 3 months for delivery of results, keeping emotionally detached from the subject, having a well defined scope, deliverables and roles.

The factors that worked in another project were, tight scope, defined roles, defined timescales, high level sponsorship from Europe, well understood problem, ownership of the problem, well controlled project, clear understanding and lots of skill involved. However, what didn't work in the project was a lack of expertise, having the right people involved. The people to be involved in the project were chosen so that there was a representative from each part of PSS that were effected by the change. This was politically correct, but not necessarily useful to the project.

The culture of PSS has become very command and control focused, which is completely opposite to the previous director of PSS. It was discussed that a balance between the two styles of management needs to be found.

Other factors that were important in the success of a project was holding a full PDW. Only holding 2 team meetings in 3 months was also useful as the project could not be tweaked and expanded.

IBM has a very geographically dispersed workforce, it was thought that this effected the success of projects.

It was said that there are times to take control and tell people to do a part of a project. If there were a certain amount of leadership it may stop the superseding of projects.

There is a need to understand both the people needs and the task requirements, at the moment PSS has lost the understanding of the people.

The loyalty to IBM has decreased as it is perceived that respect for the individual has fallen. In the past IBM were paternalistic towards there employees this is now changing towards looking employees looking after themselves.

The Framework

It was discussed that PSS suffer from short run, tactical thinking, which is proved by projects which are superseded by higher level long run projects that have not been considered.

'Scope creep' is also another characteristic which IBM suffer from. It is common for the scope of projects to be tweaked and revisited continually. This is possibly due to lack of strategic direction. If the strategies which PSS were following were clear, then the scope of sub project could be clarified more easily. Requirements which keep changing also do not help the 'scope creep'. It was also said that if strategies were straight in the first place then PSS may be able to handle change.

The amount of change, means that new changes do not get so much credibility.

Constant change means that people just ignore change, as they think it will eventually go away or be superseded by the next change.

There was a perception that there was much planning of major changes in PSS on assumptions not facts. PSS do not spend the time or the money on carrying out the research and planning stage of new projects. 'Major projects are begun on major assumptions'.

There appears to be much management by fear at the moment. There is also little analysis of the risks of a prospective project or pointing out the problems and possible problems of a project to the sponsors.

Sponsors are often bought in to just do very short run projects therefore they naturally take short run views. PSS possibly realise that they are not good at strategic thinking and have swung dramatically the other way. The cultural element and human elements have been forgotten somewhat though.

There is a misunderstanding about culture. People think it can be changed overnight and that it is a separate entity that can be considered apart from all other factors.

On the subject of project management it was said that PSS play at PM. Project teams are not often dedicated full time to a project they have been selected to work on. They are expected to be on the project team and do their current day job. PSS just does the bits of project management they like. There is a belief that the business case and sponsorship side of PM could be vastly increased and that greater responsibility and authority should be given to project teams.

On sponsorship it was discussed that the sponsor should be appropriate and should not just be a nominal sponsor. He or she should have some emotional involvement in the project. The sponsor should be there to resolve problems that the project manager cannot deal with. It was thought that sponsors didn't take enough responsibility.

It was discussed that when we undergo a management change 'everything changes. What we do and how we do it'. How we do things should not have to change this should be consistent. If everything is changed when a new management structure is introduced 'it is like changing the culture. We shouldn't need to change the culture, just its direction or focus'.

On the subject of human factors, it was thought that if people are not involved directly in the change but are effected by it, they should be communicated to about 'what's going on'. This is respectful to those involved.

It was also noted that fundamental change cannot be completed in 60 days. Managers in PSS seem to ignore this at the moment, and it needs to be called out. Long run plans are required for 'people change' (cultural change). There is a common theme in PSS at the moment of 'if you can't replace the people, replace the people'. This has led to an increase in the number of contract staff replacing permanent employees. Contract staff have replaced respect, value and career structure of the permanent employees.

In essence it was concluded that 'if more time were spent on the long run business

case to show long run benefits then we might get the case through' i.e. the approach at the moment is orientated towards decreasing costs in the short run. Long run cases are not viewed with much credibility, however if a comprehensive business case can be developed then this may be seen with more value.

Focus Group 2 - 4th December 1997. 1-4pm

Agenda:

- Introductions and administration
- Brief overview of my research over the last two years.
- Facilitated discussion section.

The facilitated session was run by asking the participants to think about the following question:

'Think of two process based change projects, one successful and one unsuccessful. For each project consider what worked, what didn't work and what could have been done differently'.

The first example of factors which lead to process based change (PBC) projects being unsuccessful was the scope of the project being ill-defined. It was only limited to a small area of the business. The correct level of the sponsorship was also absent which meant that the project did not have as much credibility as it should. The sponsorship was lacking, as it was supposed to be provided on top of business as usual. It was stated that if the sponsorship was higher then perhaps the scope may have been better defined.

It was discussed that the culture affects whether there is a result of a project is successful or not. This is particularly apparent with cross functional PBC. Where the sponsor is not at a high enough level to cross all of the functions, commitment is hard to gain. The functions where the sponsor has no authority or influence may take a 'not invented here syndrome' and not accept responsibility of the project. This problem was also linked to 'hidden hierarchies' which it was perceived exist in the culture.

One of the things which it was thought could be done differently was to think about what the success criteria of the project are. At present success and exit criteria are not usually addressed. It was noted that consistent, meaningful and communicated success criteria are needed so that a project can be measured.

It was said that it is not a learning organisation. PSS do not learn by their mistakes and it is more of a 'blame culture'. Where a mistake is made there is usually no repercussion as there is little accountability. It was noted that 'we don't learn from our experience. Reviews of what worked and what didn't work do not usually happen and we don't celebrate our successes or failures'.

One attendee felt that the unsuccessful project he had in mind was too big. It had many sub projects 'thrown' in which were unrelated. He felt that the project was unrealistic from day one and in fact shouldn't really have been called a project, as this wasn't what it was. Another problem was that when some of the attendees were assigned to project they rapidly took over and became a job.

There were also other experiences where the size of project were not understood. This often led to 'scope creep', where the project steadily increased in size. An example of 'Scope creep' was given, where a project grew from a UK to EMEA to US project. There were several examples where the unrealistic timescales, resources, IT, finance and skills are assigned to projects. Often the best people are not picked. In one case the people were

reactive types who were required to be pro-active. In another example the people were only assigned part time to the project.

Sponsors commitment to a project was noted as a factor effecting the successfulness of a project. 'Sponsors need to be continually focused. Either management churn means that the manager changes and commitment dwindles or the commitment dwindles over time.

Another problem was the lack of up front planning. It was stated that very often the solution to the problem is known before the project begins. 'They start doing before they start planning'. Another common behavior is to plan as they go 'plan in flight'.

A common occurrence is also to not implement completely which means the complete change never actually occurs and the project is not completed. It was also noted that sometimes there is not actual 'doing' just 'lots of meetings'. Interestingly it was stated that PSS do not employ completer-finishers (Belbin's team roles) which leads to unbalanced teams and perhaps difficulty in completing projects.

Expectation of the users are not usually set, this was another factor effecting success of projects.

Not having experienced project management in PSS was also noted as a problem. Project management was noted as a key factor for success as it could provide some good disciplines. 'But the environment is not accepting of project management'. There are not enough people in the project management role with the right skills. It was also said that without 'a good project manager a project is fundamentally flawed e.g. there is no scoping, planning. It is the bedrock of a project.' It is essential that there is a 'good sponsor and project manager in place and they need to support each other.'

Another problem which was talked about was the restricted time scales that are having to be worked to at the present time. There is very little time to spend planning.

Factors noted that effect successful projects included obtaining the 'correct level of sponsorship' which means its is unbiased, not politically involved, committed and active and possibly at director level.

Defining mutual benefits and doing this face to face was stated.

Identifying the correct resource, including finance, manufacturing and sales was noted as important. Involving the people effected by the change to get their 'buy in' was noted as important. Also 'getting people to sign up to the project at the outset' to get them committed was noted.

It was discussed that the goal of the project should be 'honorable', achievable and good for the business. Targets that are set within the project should also be achievable and considered to make the project credible. A project should also produce something people can use and want.

A successful project was noted as being 'tiny, within one function and having

complete control'.

Another success factor was putting a good infrastructure, exit and success criteria in place and learning processes.

It was noted that a good project need the sponsor to commit resource. A project manager needs to demonstrate leadership and control. Also need to be able to see the value of the project.

PSS is very good at generating the initial enthusiasm and launching projects.

Another key success factor was having a balanced team with the appropriate skills.

Feedback was given on 3 of the factors from the Implementation Framework. The feedback was on the organisational culture, process based change and analysis of the problem situation aspects of the framework. Responses included:

Organisational Culture

There is possibly a need to think about the national and international culture involved in a project. 'Awareness of the culture you live in'.

It was thought that the cultures in a project should be exposed so that differences were made more apparent and so that more respect could be paid to the differences.

It was discussed that cultural differences could be helped to be overcome by encouraging involvement and communication.

Process Focus

It was discussed that at the present time people did not understand what processes are. Processes are still linked to a manufacturing environment where something is made. It was also noted that process changes are not followed and 'people like it when changes don't happen'. It was said that people still perceive processes as bureaucratic and inhibiting creativity. 'Processes have got a bad name.'

To improve this situation it was stated that the benefits of processes need to be clarified and demonstrated. It was also thought that the terminology used need to be changed to language which is appropriate to the people involved in the change e.g. should not use managers speak to people who are not managers.

It was also noted that everybody needs to be involved in PBC to get buy in to the change.

Analysis of Problem Situation

It was said that there is still too much analysis of the problem after defining the project, not before defining the project. It was stated that there is much fixing of 'symptoms and not causes'.

It was thought that perhaps it was the project managers role to coach the sponsor to think about the planning stage of projects. At the moment there is a

tendency to 'draw, fire, aim - shit wrong target' (CG). Not considering the problem situation and then going off on the wrong track. This leads to unrealistic timescales, resources being set. Also valid business cases to check return of investment (whether you will get back more than you put in) is not always put together.

Transcripts from Involvement in Additional Process Change Projects

General Finding from Process Based Change Activities

In addition to the three case studies under research the author has been involved in many other change activities. The participation has been in many different forms and to various levels of involvement. Throughout this time many process based change findings have been gathered which are not necessarily from the case studies. These additional findings have helped to develop an understanding of 'the way IBM do things' in other words the way IBM work and why they work in that way (in respect to process based change activities). These additional findings have helped develop a deeper understanding of what has been occurring in the case studies.

Some of the more relevant findings have been captured below, under the same headings that have been used for the write-up of the case studies findings.

Culture

A manager who was interviewed said that PSS is full of 'solutioning'; it is a solutioning culture. As the main base of PSS are customer engineers this kind of 'Mr fix it' 'solutioning' culture has developed.

One senior manager talks often about issue management verses exception management. Issue management is much like fire fighting i.e. constantly dealing with the problems to hand and not doing much thinking ahead and long term strategic thinking. Peter said that IBMers like issue management as they get a 'feel good factor' from fixing problems immediately. There is very little thinking 'about why you have that problem'. Peter says that issue management is not good engineering practice, so it is strange that IBM has this type of behaviour as they are founded by engineers. Peter thinks that IBM should do more exceptions management and go back to think about the 'fundamentals'.

'Fixing culture is very IBM' and is preferred because it is an instant fix rather than exception management which may take several days to sort out and then another few days to pursued others to commit to the ideas. IBM to not realise that exception management will actually save time in the long run. IBM has a mentality of they 'do not have time to do exception management'.

The issue management and the fire fighting both link into IBMs tactical focus. This short run tactical focus has meant that 'much of the work that we are doing at the moment has been done before'. The problems are fixed quickly, but never actually implemented completely. PSS has a break fix syndrome. Another manager said that 'PSS are tactical planners not strategic planners' therefore PSS does not 'plan properly in the long run'. There are no long run strategies 'which make it difficult for managers who have ideas to check they match future strategies'. PSS does not tend to take a 'broad view' of a problem. The 'short run strategy focus' is not a PSS 'thing', therefore it 'must be the IBM culture, always going for the short run gain'.

It was discussed that not much time is spent in the 'diagnostic' phase. The manager said that 'we should spend time thinking through the problem, but being the culture that we are we start out straight away'. PSS's culture is one of 'get on

with it'. Much analysis and diagnostics and thinking about the problem is not viewed as valuable. Little analysis leads to rework, which leads to 'cyclical repetitions' of the problem. The manager illustrated this in figure 31. 'IBM has a work hard play hard culture, which leads to a getting things done 'Macho' culture'. The manager thinks that IBM is trying to move to a process culture.

Several senior managers said that IBM is in a 'constant state of change and flux'. To add to the complexity of change 'we keep changing the words that are used for the same work' so people think they are doing something completely different which causes confusion. For example people don't realise that they should be improving on the process architecture that's already in place, they think they should design their own process. The constant environment of change means that IBM are 'moving onwards, but not as quickly as one would like'.

There are 'no repercussions for failure'. The culture is perceived as one of 'fear' but there is no evidence for it. IBMers often feel that if they don't meet their targets they will lose their jobs, but this never actually happens. There is still this fear though, which probably came from the 'down sizing exercise of a few years ago'.

A manager discussed the fact that many customer engineers come from 'the services' and the post office. This meant that they were very used to a hierarchical environment. PSS has started to change the culture by bringing in non PSS managers. However these managers were not brought in at all levels of management, so it has taken a long time to change the environment away from hierarchies.

The IBM culture is one in which employees have a huge amount of freedom in the way that they work, therefore working in a process orientated manner is perceived as constraining.

The change in some roles brought about by process changes was resisted. Salesman's role is a good example of this, traditionally salesman purely sold products and services new processes requires them to deal with the whole process through to successful introduction.

The role of the 1st and 2nd line managers is changing. They have less time with employees and customers and more people reporting to them. The management role also lost credibility as the role is now perceived as an administration type role. This is perceived as a result of the process changes in PSS.

PSS is beginning to become more process focused and processes are beginning to be accepted and used much more willingly. However, it was drastically underestimated how long it would take to make this change in employees mind set.

As mentioned in the learning's from the case studies some areas of PSS have a individualistic culture therefore introducing a process across functions can be quite difficult. One manager discussed the fact that IBM need one incentive and management system which does not drive people to be selfish. IBM comes from a very selfish individualistic culture. It was said that process change is required before IBM can get an incentive scheme that every one is rewarded fairly.

When education was required either for those involved in the projects or the SDBI

team it was always provided at the highest standard and as quickly as possible. It is evident the quantity and quality of IBM education is renowned world-wide and is something that is deeply routed in the culture of IBM.

Project Planning and Management

A senior manager noted that if he were to improve implementation in IBM, he would build the ability to allow change into projects which are planned. The manager says this is essential as 'change can knock a project sideways e.g. the growth of PC's knocked IBM 110% over a period of just three years, which is very fast change in a short space of time. Change happens, but people design for what they know about today, they don't design for change. In fact, people put penalties in contracts if changes occur. But, requirements change, everything develops'. The manager believes that after six months every contract should have a redirection or decision point or non returnable milestone built into it. This would mean that the project can be evaluated and decisions can be made on whether the original starting place is now appropriate, whether the original requirements are still relevant. The manager believes that we need to appreciate that 'ideas will change. IBM needs to appreciate and understand this and take time to trust and work together to develop ideas, scope and requirements'.

One manager felt that IBM and its customer should be encouraged to understand what each of their interpretations of the requirements actually means. 'There should be a way to gain an understand of each others views, and then come to a common consensus of what the scope, term and conditions, liabilities, limitations of the agreement. This document could also be used to give the project a purpose to continue if some unexpected changes threaten to put the project on hold'. The manager says it is important to know the 'limits of what we are going to work within and then you need to know how we're going to do it. Thinking about the terms and conditions of the project encourage thinking through what human interactions are required to complete the terms and conditions that have been agreed. It is also important to do risk assessment to remove as many 'what ifs' and uncertainties. If as many uncertainties as possible are removed or identified then deadlines may not slip'.

A senior manager noted that 'the constant change and changing requirements mean that timescales are never met. If we constantly focus on expectations and requirements then timescales can be re-addressed and timescales may no longer slip'.

There has been much organisational structure change during the time frame of this research. Constant reorganisation meant that projects were being started and then being superseded by a new projects relevant to the new organisation and projects were started and never finished as resources were redeployed to different areas.

One of the sponsor agreed that planning a change was important, but he said it was also 'important for someone to drive the change, or no actions will ever be taken.'

One sponsor said he was very disappointed in the inability of the senior management committee to 'look at the broader picture' concerning his CSS project. The sponsor also felt that IBM were not 'breeding people who were

visionary enough,' he said that 'IBM need more leaders who could identify changes and then go and make them happen.'

On the subject of project planning one managers view was that, generally in PSS managers 'see a problem, but they don't analyse it, they just attack the symptom and not the cause'. The 'repercussions upstream and downstream' do not tend to be looked at.

One manager who was interviewed perception was that there are 'lots of 'in the bath thinking' or 'eureka' thinking ideas i.e. come up with an idea and don't spend time thinking up alternatives'.

In a discussion about project planning and management one manager said that 'actions are carried forward as people don't recognise the consequences of not completing actions'. The manager thought that perhaps if the project team worked together more closely that they would may be more responsible for their actions as they would be able to see the effect of not completing an action on their fellow team mates.

It is evident that much work is started and never completed because of new organisational change which takes over. One interviewee suggested that holding a PDW could help make an assessment of how important the project is and therefore how likely it is to be continued during an organisational change.

All three case studies used the services of a facilitator. Two of the case studies used a facilitator throughout the duration of the project and the final case study used a facilitator when appropriate.

In one interview it was discussed that the overall problem of the project was that too little time was spent on planning and thinking the problem through. Whether this was a 'western thing' or an 'IBM thing' was unsure.

The facilitator was usually a member of the Business Improvement Team (BIT). The BIT professional applied (and transferred where appropriate) different areas of knowledge and skill where and when required or asked. Examples of skills which were requested include facilitation, negotiation, leading, training, educating and team advising.

A major corporate wide change would normally take a number of years to complete, PSS under estimated how long their re-engineering projects would take. This under estimate led to unrealistic and slipping time scales.

There is no standard approach used to complete projects. For example different criteria are applied to choosing project team members, different timescales are worked to and activities are not completed in any set sequence.

Each of the three case studies were run by project teams. Each team had a sponsor who owned the project. This sponsor was usually a member of top management this means that the project had top management commitment. The project team usually completed the project by forming a series of sub project teams who completed sub projects.

A Project Definition Workshop (PDW) is generally carried out at the outset of the

project so that the objectives, boundaries, risks and dependencies etc. are clearly defined. A project plan should accompany the PDW, where the actions and milestones of the project should be assigned owners and deadlines for completion.

From the outputs of the PDW a Project Definition Report (PDR) is created. The main purpose of the PDR is to document the details of the project. The document also sets out the major milestones for project completion. The project can then be managed from the report.

In the case studies that suffered major changes. An interviewee said that 'if one person had been responsible for the project, such as a project manager, they should have spoken to the new manager to get his commitment to the project.'

There is no standard approach used to complete projects. For example different criteria are applied to choosing project team members, different timescales are worked to and activities are not completed in any set sequence.

The facilitator who has been assigned to the project must be prepared to dedicate a high amount of time at the beginning of the project e.g. 3 days a week for the first 3 months. The time required may tail off depending on the particular circumstances of the project. An assessment of the time investment that will be required should be completed at the outset of the project.

Human Factors

A sponsor of a case study noted that changes at IBM took a long time. The sponsor said that if a project has high level sponsorship, commitment and involvement then implementation would be considerably shorter. This sponsorship would mean that the project looks important within IBM and to customers.

One sponsor of a case study said that leadership of a project is extremely important. 'Someone has to be committed, have a vision and a desire to see the project through, otherwise the project will not happen. Generally this desire has to be for the good of the company rather than yourself as well'. The sponsor also said that leadership linked in with top management commitment, pre planning and project management.

Sponsorship was discussed as being essential to bring inspirational and motivational leadership. In IBM there were problems where the 'title' of sponsor was taken but the responsibilities that go with it were not. The interviewee thought that there were problems on the projects where sponsors did not get involved e.g. sponsor not attending kick off meetings.

Of sponsorship a senior manager said that there is a requirement to have a sponsor from the 'line', the higher the management the better. The sponsor can not be from the 'staff' as they must have the power to influence and enforce. The manager also says that because of the high level we require the sponsor to come from we cannot expect them to be involved in the detail of the project. The manager thought that 'below the sponsor an evangelist or believer is required to drive the project and to drive the sponsor to tell him what to say and what will happen. Although, keeping the same sponsor is difficult across the life of the project as IBM change their people so often'.

During the last few years IBM has decreased its work-force drastically, in some areas this has lead to a lack of available resource. In several of the case studies this has meant that resource is unable to be allocated in every area required.

The communications about process changes are perceived as insufficient, in some cases inconsistent and confusing, particularly to front line employees. In many cases employees do not understand what process change is or the reasons why it is being introduced.

One manager said that communications in IBM were 'noss note' based and once managers have sent a note they think they have communicated. In reality all that has happened is a note has been sent which may or may not have been read. IBM'er 'forget to use the telephone'. IBM also think that by putting an article in an IBM publication that everybody will understand and be bought into the subject.

On the subject of teamworking one manager commented that teamworking in IBM means 'getting individuals to belong to the whole and the whole is very big and individuals don't like belonging to a big team'. It was said that 'some small project teams worked very well. But they become insular and do not achieve all their objectives'.

Due to the number of change initiatives and reorganisations that had occurred over the last few years recent process change is perceived as just another 'fad'.

The constant re-organisation has diluted the affect of re-engineering.

Process changes often seriously lacked credibility, due to a combination of factors, such as lack of top management commitment, constantly slipping schedules and lack of consistent communication.

Systems Integration (area of Global Services organisation) is commonly seen as a good example of process change implementation. This success of process changes is usually attributed to the huge pressure this area was under to reverse the huge losses in profit that it was making and the excellent top management commitment that existed.

Process change so far has lacked leadership from top and senior management. This has manifested itself in different ways, such as the management were seen to be talking about necessary process change, but not actually 'doing' it. It was perceived that many managers were just paying 'lip service' to process change.

The benefits of process changes were not clearly for the benefit of front line employees. This meant that the level of commitment to the changes was not as high as required.

The deployment of the processes was delegated to the professionals, rather than the management. This action again illustrated the lack of commitment and involvement of top management.

It was difficult to see the benefits of process change and the benefits of process management had not been made aware.

The major reductions in work-force has meant that there was a lack of resource to

implement process based change.

There is much fire fighting (constantly dealing with immediate problems) occurring, mainly due to the fact that people are busy trying to work with inadequate processes, rather than spending time planning for process change implementation.

In the case studies that have good top management commitment and a strong steering committee there appears to be excellent motivation and commitment to the project. The project has kept to its time scales and has delivered all outputs required.

The facilitator who has been assigned to the project must be prepared to dedicate a high amount of time at the beginning of the project e.g. 3 days a week for the first 3 months. The time required may tail off depending on the particular circumstances of the project. An assessment of the time investment that will be required should be completed at the outset of the project.

Process Based Change

One of the sponsors noted that a key problem with re-engineering on a small scale was difficult to complete as it must be co-ordinated with the European and world-wide re-engineering initiatives. As re-engineering has to be done from the top down there is little freedom to continue with work until the European and world-wide business purpose is confirmed.

Of process re-engineering one senior manager said that there are standard world-wide processes defined. People often think that they have to design processes specifically for there part of the organisation. The manager said says that what they don't realise is that what they have to is take the basic process design that has been provided and design specific procedures, practices and disciplines. The processes just need 'tuning'. He also noted that 'Process re-engineering needs enforcing at the outset before it leads to a democracy'.

One of the initial problems with the process changes was that the changes were deployed without the supporting technology. This meant that the processes could only be partly implemented and they could not be used as they were intended.

A fundamental problem is that process design was developed separately from the technology, therefore some of the technology did not fit the purpose of the processes completely.

One initial criticle problem with the implementation of process change was that the processes were trying to be implemented across the old management hierarchy. This problem has been elevated to some extent during the years reorganisations.

There is no one standard process modelling tools in use. There was also no standard approach to assessing which process modelling tool would be appropriate. The tool was usually chosen on the strength of facilitators personal preference or which tool was most popular at the time. The tools which were chosen included LOVEM, IDEF0, IBP Chart, ithink and Flowmark.

In some parts of the organisation the processes did not fit with certain areas of

business.

APPENDIX 5

Process for Running the Implementation Focus Group

The focus group should be held at the very early stages in the implementation. This ensures that all themes of the framework that are crucial for successful implementation are considered from implementation initiation. The focus group should be the first group meeting about the process change, before any formal project management system is put in place.

The focus group meeting is a facilitated session that should take place over half a day. The main objectives are to gain commitment to the project and to investigate the problem situation from the key stakeholders. The attendees to the workshop should be the project owner, project sponsor (possibly the same person), a key user or specialist from all areas affected by the problem situation being investigated and the project manager (if known).

An example format that the focus group could follow is shown below. The facilitator should navigate the focus group attendees through this agenda.

- Introduction - (Project Sponsor and Process Owner)
- The Problem
- The Goal of the Project
- Scope of the Project
 - People
 - ~ User Involvement
 - ~ Senior Management Commitment
 - Process
 - Systems
- Project Management System
- Feedback

Each item on the focus group agenda is aimed at addressing a different theme or sub-theme of the framework. For each item on the agenda a set of questions has been suggested.

Focusing discussion around the problem and goal of the project is aimed at addressing the analysis of the problem situation. This will help to gather as much information about the problem situation and alternative methods of solving the problem as possible. The facilitators questions should include:

- What is the problem we are investigating?
- How should this problem be investigated?
- Who should do this investigation?
- What other projects will be affected by this project and which projects will have an effect on this problem?
- What methods of problem solving could be used for this project?
- What would be a good way to measure the success of this investigation?
- What should the goal of this project be?

A discussion about the scope of project helps examine what people, processes

and systems are directly and indirectly affected and involved in the process change. This will help to define a boundary around the project for what is and what is not included.

The discussion about the people who are directly involved in the project is aimed at identifying employees who are likely to form the project team and how they will be involved in the project. By addressing who will be indirectly affected by the process change the topic of user involvement should be addressed further.

Questions that the facilitator may ask, could include:

- Who should be directly involved in the project?
- Who will be affected by the project?
- How could we involve people directly?
- How could we involve people indirectly affected by the project?
- How could we measure the success of the direct involvement?
- How could we measure the success of the indirect involvement?
- Is there anything else in your experience that has worked well to get the people directly or indirectly involved?

The questions about senior management commitment are aimed at identifying exactly which senior managers commitment needs to be gained to ensure the project receives the relevant funding and resources it needs to be a success. It is also important to confirm who the sponsor of project is. The sponsors commitment to lead the project through to successful completion should be obtained. Relevant questions could be:

- Who should be the owner of the project?
- Who should be the sponsor of this project?
- Is there anybody else who needs to show commitment to this project?
- How do you think sponsorship should be demonstrated?
- How do you think ownership should be demonstrated?
- How do you think management commitment should be demonstrated?
- How can we measure the commitment/sponsorship/ownership?
- Is there anything else that has worked well in the past in sponsorship/management commitment/ownership?

Focus group questions about the processes should identify what the end-to-end process under investigation is and what activities it involves. It is also useful to understand what processes provide inputs and receive outputs from this process. Appropriate questions could be:

- What is the end-to-end process under investigation?
- What activities does the process involve?
- Who should be investigating/designing this process?
- How should we measure the process?
- Is there anything else that you have seen working in a process redesign project?

The systems discussion should focus on other IS and IT projects that will be involved in the change or be affected by the change. These questions are concerned with understanding the problem situation as thoroughly as possible. Typical questions could be:

- What IT/IS are involved in this project?
- What systems are affected by this project?
- How are they going to be involved?
- Who should be responsible for their involvement?
- How are we going to measure the success of this involvement?

The project management system discussion directly addresses the issue of putting a formal project management system in place. Here the need for planning the project right through to completion should be stressed. Relevant questions could be:

- What would you like the project management system to include?
- What sort of timescales would you like to see for this project?
- Who would you like to be responsible for it?
- How should we measure the success of this system?
- Is there anything else from your experience that works well in a project management system?

Feedback should be asked from each attendee so that the focus group process can be improved. This can be asked for in the meeting, or a feedback request form could be distributed after the meeting via an email request. Typical feedback questions are:

- What worked well in the meeting?
- What did not work well in the meeting?
- What would you do differently with the meeting?
- What worked well with the meeting process that was followed?
- What did not work about the meeting process that was followed?
- What would you have done differently with the meeting process?

The outputs from the session should be recorded by the facilitator. The data should be written up and presented in a report style format. The report should be distributed to the attendees of the focus group and the employees who will become members of the project team.

The information should be used as input to direct the project start-up meeting. This meeting should be part of the formal project management system, where the project goal, objectives, boundaries, timescales, risks, assumptions and dependencies are agreed. Arrangements for this type of meeting should be bought up in the focus group if it does not arise naturally.

APPENDIX 6

Implementation of Process Based Change Audit Questionnaire

As one of the deliverables of my research at IBM I have created a framework which can be used for improving the implementation of process based change (PBC) projects.

As part of this framework I have developed the following questionnaire. The purpose of this questionnaire is to identify areas in a process based change project that may need some additional work or attention. Where the analysis of the questionnaire shows there may be some inadequately developed areas, then these areas can be worked on by the project team.

From my research at IBM and literature reviews on the subject of implementation several dominant themes have emerged as crucial for successful implementation. These five themes are, Senior Management Commitment, Analysis of Problem Situation, Process Based Change, User Involvement and Project Planning and Management. It is these themes that the questionnaire seeks to explore.

The questionnaire consists of a number of statements which may be used to describe different aspects of the process based change project. Please could you answer each of the questions with reference to the Management Operating Systems (MOS) - Product Cost Review Process project.

This is a project that is sponsored by Mick Watson to implement a costs review process. This review is specifically about comparing planned versus actual product service costs, with the objective of putting any out-of-line products back on track. Additional information on this project can be viewed on the Bid Process Reengineering database.

Instructions for Completing The Implementation of Process Based Change Audit Questionnaire

The questionnaire is attempting to measure what you think about the MOS Product Costs Review Process project. For each statement you have five possible responses to choose from. The possible responses range from strongly agree to strongly disagree as illustrated below.

Strongly Disagree	Disagree	Neutral (Neither Agree or Disagree)	Agree	Strongly Agree
1	2	3	4	5

When completing this questionnaire please do not confer or discuss the statements with colleagues before deciding your answer. Please work through the statements quickly - often your first answer is the best, although please ensure you have answered every question. Please mark your chosen response clearly. It is also very important that you only give ONE answer per statement or the results will be unusable.

Please note that in order to ensure confidentiality the questionnaire is completely anonymous and there will be no follow up to discuss your responses.

Thank you very much for completing this questionnaire. Please could you return the completed questionnaire by post to Zoe Nash at 3GN Bedford or Fax on 0181 818 5489.

If you have any questions or queries about this questionnaire, or the MOS project please feel free to contact me on 364866 or 0802 870410.

Once again thank you very much for your help and your time in completing this questionnaire for me.

Zoe Nash

RESPONDENT DETAILS

1. Please tick if you are a member of the MOS project team.....

☐

2. Job level?.....

☐
☐

senior manager

second line manager

☐
☐

first line manager

professional

3. Work area?.....

Product Planning

☐

MVM

☐

Other

☐

4. If other please specify.....

5. Please specify your base location

6. Finally, If you have any comments you would like to add about the MOS project in light of this questionnaire or about the questionnaire itself, please use the space below.

**THANK YOU FOR TAKING THE TIME TO
COMPLETE THIS QUESTIONNAIRE**

**Please return your questionnaire to:
Zoe Nash, 3GN, Bedford.
Tel. 364866 Int 0181 818 4866 Ext
Fax. 0181 818 5489.**

5 = strongly agree					
4 = agree					
3 = neutral (neither agree or disagree)					
2 = disagree					
1 = strongly disagree					
1. The process change is really needed.	1	2	3	4	5
2. Those affected by the process change understand clearly the nature of the problem the MOS project is dealing with.	1	2	3	4	5
3. Some people were not convinced that this process change was necessary.	1	2	3	4	5
4. Different and alternative perspectives of the problem have been considered.	1	2	3	4	5
5. Alternative approaches to solving the problem have not been considered.	1	2	3	4	5
6. The real problem is being addressed, and not just a symptom of a more complex problem.	1	2	3	4	5
7. Insufficient time was spent on investigating the problem.	1	2	3	4	5
9. The process owner has been identified.	1	2	3	4	5
10. The process owner has end-to-end responsibility for the new process.	1	2	3	4	5
11. A business case has been written for this project.	1	2	3	4	5
12. Communications to all those immediately affected by the process change have been planned.	1	2	3	4	5
13. The sponsor of the MOS Product Cost Review Process project is a senior manager who possesses the authority necessary to institute these changes.	1	2	3	4	5
14. The sponsor demonstrates commitment to making the process change happen.	1	2	3	4	5
15. The sponsor understands the process change	1	2	3	4	5
16. The project lends itself to an individual effort rather than a team-based approach.	1	2	3	4	5
17. A project manager is effectively managing the progress of the project.	1	2	3	4	5
18. All those directly affected by the project been have identified.	1	2	3	4	5
19. All those indirectly affected by the project have been identified.	1	2	3	4	5
20. Input has been solicited from the end users through-out this project.	1	2	3	4	5

5 = strongly agree					
4 = agree					
3 = neutral (neither agree or disagree)					
2 = disagree					
1 = strongly disagree					
21. The sponsor is ineffectively leading this process change.	1	2	3	4	5
22. The sponsor believes that there is a real need for the change.	1	2	3	4	5
23. The sponsor has articulated the vision and clearly defined the objective for the project.	1	2	3	4	5
24. The process being investigated is not thoroughly understood by the whole project work group.	1	2	3	4	5
25. The process change is compatible with existing organisational processes.	1	2	3	4	5
26. The process change is compatible with other process changes in progress.	1	2	3	4	5
27. It is not clear where this project fits into other projects occurring in PSS.	1	2	3	4	5
28. Project members feel ownership of the process change.	1	2	3	4	5
29. Project work group members understand their roles in the process change project.	1	2	3	4	5
30. Those working on the project work as a team.	1	2	3	4	5
31. A team is designing the process.	1	2	3	4	5
32. Members of the project work group are responsible for achieving the objectives of the project.	1	2	3	4	5
33. The risks, dependencies and assumptions of the project have not been adequately assessed.	1	2	3	4	5
34. Insufficient Information about this project is being communicated in PSS.	1	2	3	4	5
35. The information being communicated gives a clear and consistent message.	1	2	3	4	5
36. Communication between those directly involved in the project is effective.	1	2	3	4	5
37. A change agent (e.g. project manager, facilitator, team leader) is leading the change.	1	2	3	4	5
38. The change agent has the necessary skills required to be a change agent.	1	2	3	4	5
39. The change agent is ineffectively managing the change.	1	2	3	4	5

5 = strongly agree					
4 = agree					
3 = neutral (neither agree or disagree)					
2 = disagree					
1 = strongly disagree					
40. The processes which provide inputs to this process have been considered.	1	2	3	4	5
41. The processes which receive outputs from this process have been considered.	1	2	3	4	5
42. There has been insufficient provision for incidences where the process crosses functional or departmental boundaries.	1	2	3	4	5
43. The process change is 'breaking the rules' and challenging long-standing assumptions i.e. the process is being reengineered/redesigned rather than fixed.	1	2	3	4	5
44. The other projects which will impact this change have been considered.	1	2	3	4	5
45. There is no co-ordination with other project teams carrying out related projects.	1	2	3	4	5
46. The education and training required to use this process change will be provided.	1	2	3	4	5
47. There is two way communication between the representatives of the users and the project work group about this project.	1	2	3	4	5
48. Feedback is not used as a mechanism to improve the process.	1	2	3	4	5
49. The financial resources needed to implement this process change are available.	1	2	3	4	5
50. The human resources needed to implement this process change are available.	1	2	3	4	5
51. The sponsor will remain as the sponsor of the project until the process is completely implemented.	1	2	3	4	5
52. The sponsor shows consistent sustained commitment to the project.	1	2	3	4	5
53. The senior management team also demonstrate their commitment to this project.	1	2	3	4	5
54. The project has been planned through to completion.	1	2	3	4	5
55. The project timescales are realistic.	1	2	3	4	5
56. The project plan is not achievable e.g. insufficient human resource, IT, finance etc.	1	2	3	4	5

	5 = strongly agree				
	4 = agree				
	3 = neutral (neither agree or disagree)				
	2 = disagree				
	1 = strongly disagree				
57. The impact of this process change on the end users daily work patterns have been adequately considered.	1	2	3	4	5
58. The inputs, outputs and dataflows of the process have been defined in detail.	1	2	3	4	5
59. Measures of how well the process is performing are being established e.g. end-to-end process cycle time.	1	2	3	4	5
60. Project work group members are unreliable about carrying out duties and responsibilities assigned to them.	1	2	3	4	5
61. The affect this process change will have on other projects has been considered.	1	2	3	4	5
62. Mechanisms for continually improving the process will be put in place.	1	2	3	4	5
63. The project plan includes milestones which are to be met throughout the life of the project.	1	2	3	4	5
64. The project is on time	1	2	3	4	5
65. Meetings between the project manager and each level of the project structure occur regularly.	1	2	3	4	5
66. The original aims and objectives of the project are not reviewed and revised periodically.	1	2	3	4	5
67. The long-term impact of this change on the organisation has been considered.	1	2	3	4	5
68. The process change will not offer significant tangible benefits, such as faster cycle time, reduced number of delays, less rework, decreased costs, increase customer satisfaction.	1	2	3	4	5
69. There is an effective process for documenting and storing all project information.	1	2	3	4	5
70. The project documentation and information is easily accessible.	1	2	3	4	5
71. The technology and information systems that will be affected by the process change have been considered.	1	2	3	4	5
72. There is no provision for the IT and IS requirements that will be needed to support the process change.	1	2	3	4	5
73. Human resource will be made available to use the new process.	1	2	3	4	5

	5 = strongly agree				
	4 = agree				
	3 = neutral (neither agree or disagree)				
	2 = disagree				
	1 = strongly disagree				
74. Systems and procedures to ensure the process must be used, (not worked around) will be implemented.	1	2	3	4	5
75. Overall, I am satisfied with the outcomes of this project so far.	1	2	3	4	5
76. Overall, I believe this project will achieve what it set out to.	1	2	3	4	5

Please answer if the process change will affect the way you work

77. The process change will not enhance my job role.	1	2	3	4	5
78. Once the process is fully implemented I will use the new process.	1	2	3	4	5

APPENDIX 7

Questionnaire Results

Questionnaire 1

Questionnaire 2

Category = Senior Management Commitment

Qu	Sum	Avg	Overall var		Qu	Sum	Avg	Overall var	sd	
13	47	3.92	3.67	0.63	13	51	4.25	3.97	0.57	0.75
14	49	4.08	3.67	0.45	14	53	4.42	3.97	0.45	0.67
15	51	4.25	3.67	0.57	15	49	4.08	3.97	0.81	0.90
21	40	3.33	3.67	1.52	21	49	4.08	3.97	0.45	0.67
22	52	4.33	3.67	0.42	22	51	4.25	3.97	0.39	0.62
23	43	3.58	3.67	0.45	23	46	3.83	3.97	0.52	0.72
37	41	3.42	3.67	0.63	37	45	3.75	3.97	0.93	0.97
38	42	3.50	3.67	0.27	38	45	3.75	3.97	0.57	0.75
39	33	2.75	3.67	0.75	39	43	3.58	3.97	0.81	0.90
51	42	3.50	3.67	0.82	51	47	3.92	3.97	0.45	0.67
52	47	3.92	3.67	0.27	52	48	4.00	3.97	0.18	0.43
53	41	3.42	3.67	0.45	53	44	3.67	3.97	0.61	0.78

Category = Process Based Change

1	58	4.83	3.39	0.15	1	59	4.92	3.70	0.08	0.29
9	48	4.00	3.39	0.91	9	52	4.33	3.70	0.61	0.78
10	42	3.50	3.39	2.09	10	42	3.50	3.70	1.91	1.38
24	34	2.83	3.39	0.88	24	38	3.17	3.70	0.70	0.83
25	38	3.17	3.39	1.24	25	41	3.42	3.70	0.81	0.90
26	39	3.25	3.39	1.48	26	43	3.58	3.70	0.63	0.79
31	36	3.00	3.39	0.55	31	43	3.58	3.70	0.45	0.67
40	42	3.50	3.39	0.64	40	42	3.50	3.70	0.64	0.80
41	43	3.58	3.39	0.45	41	43	3.58	3.70	0.45	0.67
42	35	2.92	3.39	1.17	42	39	3.25	3.70	1.11	1.06
43	37	3.08	3.39	1.36	43	44	3.67	3.70	0.79	0.89
46	42	3.50	3.39	0.45	46	46	3.83	3.70	0.33	0.58
58	35	2.92	3.39	1.17	58	45	3.75	3.70	0.57	0.75
59	36	3.00	3.39	1.09	59	45	3.75	3.70	0.57	0.75
62	36	3.00	3.39	0.73	62	40	3.33	3.70	0.79	0.89
68	50	4.17	3.39	0.33	68	51	4.25	3.70	0.39	0.62
72	40	3.33	3.39	0.79	72	42	3.50	3.70	1.18	1.09
73	42	3.50	3.39	0.64	73	44	3.67	3.70	0.42	0.65
74	39	3.25	3.39	0.75	74	44	3.67	3.70	0.61	0.78

Category = Analysis of Problem Situation

4	36	3.00	3.23	0.73	4	46	3.83	3.66	0.15	0.39
5	35	2.92	3.23	0.63	5	47	3.92	3.66	0.45	0.67
6	45	3.75	3.23	0.57	6	47	3.92	3.66	0.45	0.67
7	35	2.92	3.23	1.36	7	43	3.58	3.66	0.63	0.79
18	42	3.50	3.23	1.18	18	41	3.42	3.66	0.63	0.79
19	31	2.58	3.23	0.99	19	37	3.08	3.66	0.81	0.90
27	38	3.17	3.23	0.70	27	47	3.92	3.66	1.36	1.16
44	40	3.33	3.23	0.61	44	45	3.75	3.66	0.57	0.75
61	41	3.42	3.23	0.99	61	38	3.17	3.66	0.70	0.83
67	40	3.33	3.23	1.15	67	44	3.67	3.66	0.97	0.98
71	43	3.58	3.23	0.81	71	48	4.00	3.66	0.91	0.95

Category = User Involvement

2	43	3.58	3.15	0.45	2	48	3.83	3.48	0.33	0.58
3	34	2.83	3.15	1.06	3	34	2.83	3.48	1.42	1.19
20	35	2.92	3.15	1.54	20	45	3.75	3.48	0.75	0.87
28	41	3.42	3.15	0.63	28	43	3.58	3.48	0.99	1.00
49	39	3.25	3.15	0.93	49	41	3.42	3.48	0.63	0.79
50	38	3.17	3.15	1.24	50	44	3.67	3.48	0.79	0.89
57	35	2.92	3.15	0.63	57	38	3.17	3.48	0.52	0.72

Category = Communications

12	34	2.83	3.02	1.06	12	43	3.58	3.58	0.63	0.79
34	30	2.50	3.02	1.18	34	37	3.08	3.58	1.17	1.08
35	33	2.75	3.02	0.39	35	42	3.50	3.58	0.64	0.80
36	38	3.17	3.02	0.70	36	47	3.92	3.58	0.45	0.67
45	40	3.33	3.02	0.81	45	48	3.83	3.58	0.52	0.72
47	37	3.08	3.02	0.63	47	39	3.25	3.58	0.57	0.75
48	42	3.50	3.02	1.18	48	45	3.75	3.58	0.93	0.97

Category = Teamworking

16	46	3.83	3.33	1.08	16	48	4.00	3.61	0.36	0.60
29	42	3.50	3.33	0.45	29	44	3.67	3.61	0.61	0.78
30	32	2.67	3.33	0.61	30	38	3.17	3.61	1.42	1.19

Category = Project Management

11	32	2.67	3.34	0.79	11	42	3.50	3.73	1.00	1.00
17	44	3.67	3.34	0.79	17	46	3.83	3.73	0.15	0.39
32	46	3.83	3.34	0.15	32	49	4.08	3.73	0.27	0.51
33	34	2.83	3.34	1.06	33	39	3.25	3.73	0.93	0.97
54	36	3.00	3.34	1.09	54	45	3.75	3.73	0.57	0.75
55	38	3.17	3.34	1.42	55	47	3.92	3.73	0.27	0.51
56	44	3.67	3.34	0.61	56	45	3.75	3.73	1.11	1.08
60	41	3.42	3.34	0.63	60	36	3.00	3.73	0.91	0.95
63	43	3.58	3.34	0.45	63	48	4.00	3.73	0.55	0.74
64	39	3.25	3.34	0.75	64	43	3.58	3.73	0.63	0.79
65	41	3.42	3.34	0.99	65	45	3.75	3.73	1.30	1.14
66	34	2.83	3.34	1.24	66	45	3.75	3.73	1.30	1.14
69	45	3.75	3.34	0.39	69	49	4.08	3.73	0.45	0.67
70	44	3.67	3.34	0.79	70	48	4.00	3.73	0.55	0.74

Category = Overall Satisfaction

76	42	3.50	3.58	1.00	76	49	4.08	3.93	0.45	0.67
77	44	3.67	3.58	0.79	77	45.218	3.77	3.93	0.47	0.68

Publications

BUSINESS INFORMATION TECHNOLOGY CONFERENCE 1997

NASH Z, MAULL R, CHILDE S. 1997. Implementation of Process Based Change. In R Hackney (editor) Proceedings of the Business Information Management Alternative Futures Conference. Manchester Metropolitan University, Manchester, UK

Implementation of Process Based Change

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Introduction

The research is a joint collaboration between the University of Plymouth and IBM UK Ltd. The specific part of the organisation that is under study is Product Support and Services (PSS). This division is primarily responsible for the maintenance of hardware and systems software and the selling of services associated with them. PSS provide services such as, design, implementation, IT planning and operational and systems management which cross all technology boundaries in order to support in an integrated mixed IT environment. These services are provided for both IBM and non-IBM products.

The principle author works full time in IBM and is currently heavily involved in business improvement activities occurring at IBM. The process changes in PSS aim to deploy a common set of processes that are required to operate a marketing and services company.

The purpose of the research is to find out what actually happens when an organisation implements process based change. A second aim is to understand the problems that are faced when implementing process based change.

Implementation is a complex concept that is found in many different disciplines, such as management science, manufacturing operations, social science and information technology. Ginzberg¹ provides a useful definition of implementation as 'beginning with the first thought of developing a system, and not ending until the user either is satisfied that he is in control of the system or has abandoned the project.'

Meredith² and other authors^{3 4} have discussed the problems surrounding implementation. Meredith² noted that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Fifteen years on from Meredith's article there is still much literature reporting on implementation issues.

The focus of this research is to investigate the implementation of process based change. Changing processes is an activity which is generally known as Business Process Re-engineering (BPR). Hammer who wrote the seminal article on BPR defines re-engineering as, 'the fundamental rethinking of business processes to achieve dramatic improvement in critical, contemporary measures of performance, such as cost, quality, service and speed.'⁵

Since 1990 when BPR first began to emerge there has been an enormous amount of literature generated on the subject. Some of the literature⁶ is concerned with reports of unsuccessful implementation of projects, for example Hammer estimated that 'between 50 and 70 percent of re-engineering efforts were not successful in achieving the desired breakthrough performance.'⁷

The empirical evidence that has been gathered so far indicates that there is very little successful implementation. It is often the case that implementation is curtailed prematurely. Implementation failures are also still being reported in the literature, (particularly in the area of process change). This indicates that there are still many implementation aspects, problems and issues that have not yet been fully examined and solved. In support of this view Sabherwal

and Robey in their article on information systems implementation say that the state of knowledge about implementation is 'analogous to cooking with a list of ingredients but without the recipe. We need more research on how the ingredients are combined before a recipe for successful implementation can be prescribed'.⁸

Views of Implementation

When considering implementation it is useful to consider different authors' views and definitions of implementation. Much of the traditional implementation literature discusses technical implementation of computer systems where implementation is traditionally described as being one of the final stages in the systems life cycle. The systems life cycle (SLC) or systems development life cycle (SDLC) is a model used to identify stages in the development of a system, typically a computer system.

Ginzberg describes the traditional view of implementation as 'that part of the development cycle beginning after the system or model has been designed and built, and ending as soon as outputs are produced'.¹ the type of activities which are typically included are systems programming and testing, user training and the physical change from the old to the new system.

Lucas puts forward an alternative approach to implementation as one of the final stages of systems development. This alternative approach considers implementation as being part of all stages of the systems life cycle. This view describes implementation as 'an on-going process which includes the entire development of the system from the original suggestion through the feasibility study, systems analysis and design, programming, training, conversion, and installation of the system'.⁹

The term which has been coined to describe this view is the 'wider view' of implementation. This view of implementation is held by authors such as Lucas⁹, Ginzberg¹ and Meredith². It is this wider view of implementation which will be used for the purpose of the research. An appropriate definition of this view of implementation is put forward by Childe as:

'Implementation involves managing the expectations and activities of people which cannot be so simply understood and managed. Implementation is not complete until the system is brought into full use to the point when the company begins to benefit from it, although the success of the implementation may depend upon all the stages from the initial concept of the system onwards'.¹⁰

Research Method

The research is taking place over a three year period from September 1995 to September 1998. As the researcher is closely involved with the implementation of change in IBM, it is appropriate that the main mode of research should be Action Research (AR). To gain a detailed, in-depth understanding, (and most importantly a feeling) of what occurs during implementation and experience implementation first hand, an AR approach is required.

Gummeson describes action research as 'the most demanding and far-reaching data generating method in case-study research'.¹¹ It involves the researcher forming a relationship with an organisation. Once the researcher is placed in the host organisation there must be 'the expressed intention of both parties to be involved in change'.¹³

Rapaport provides a definition of AR as 'Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.'¹²

Case Studies

In order to cover a significant cross section of the process based changes three projects have been identified for analysis.

- A problem identification and problem resolution project in the IBM Central Support Services (CSS).
- A process redesign project in the services development area.
- A project to implement a teamworking culture across PSS.

From the empirical evidence collected and research already completed, it has become evident that several areas of theory will be useful to help understand and explain what is happening in the case studies. These areas include human factors, organisational culture, project management (these will be discussed later in the paper) and systems concepts.

Systems Concepts

Systems concepts will be used for understanding the problems occurring in the case studies. Systems concepts are a collection of concepts which may be used for identifying a whole object, such as an organisation or a project. 'System' is an abstract idea. A system may be described as 'a set of elements connected together which form a whole, thus showing properties which are properties of the whole, rather than properties of its component parts'¹³. Systems concept may be useful to help identify and understand all the elements in the case studies and how they interact.

Once the system is identified and defined the systems approach can then be used to model this part of the real world. Once a part of the real world (system) has been identified the systems approach can be used for modelling and communicating this part of the real world with an aim to gaining an improving understanding of this part of the world and how it can be improved upon.

Central Support Services (CSS) Case Study

Due to the space constraint only one case study will be described. The case study was based in IBM's Central Support Services (CSS). Research was carried out from January 1996 to December 1996. The support centres are a group that assist customers when their computer systems fail. Customers who purchase the breakdown and recovery maintenance services from IBM are entitled to call the support centre for assistance with queries and technical problems. When the customer reports a system failure the problems are either fixed remotely by people in the IBM support centres, or where necessary a customer engineer is sent on to the customer site to manually fix the computer system.

The support groups are divided into different areas depending on the type of technology that is specialised in. The areas which were investigated include, enterprise software support, enterprise hardware support, enterprise assist, network support group and AS400 computers. Enterprise technology is large scale technology, an example is all the technology that requires maintenance in all a supermarkets stores in the UK.

The objective of the project was to collect information about processes that were in operation in the IBM customer support centres. It was initiated by the Solutions Delivery process owner so that a business decision about whether the processes should be re-engineered or incrementally improved could be made. During 1995 it had become increasingly apparent to

managers in the support centres that their processes are quite badly 'broken'. In addition to the 'broken' processes there were several other serious issues which were of concern, these included:

- There were an increasing amount of stories and rumours being generated about the quality of the service received from the support centres, such as they are quite ineffective and inefficient with many delays. There were very few facts to support these stories.
- There was also increasing pressure from customers who did not believe that IBM supported them well enough.
- The support environment is changing. IBM had made no strategic decisions on how to plan for these changes in the external environment and market.
- There was a serious lack of knowledge about how the support centres operate. For example there was little known about the size of the support business, whether the business was increasing or decreasing, or the productivity of support i.e. the number of problems handled per person per day.
- CSS is divided by technical specialisation which has led to a high level of functional specialisation. There was a problem of little communication between functions.
- It was perceived that customers now want a fully integrated support service which can support all their hardware, software and networking needs in one service. IBM could not provide this type of service at present time.
- CSS had evolved in an unplanned fashion rather than by planned, managed strategic change. It was therefore perceived that the CSS may not be organised to its optimum efficiency.

The main method of research was via interviews. Interviews were held with managers of each area and then with specialists in each area. Over 20 interviews were conducted. Each interview averaged one to two hours and they were usually informal discussions at the interviewees workplace.

The type of information that was gathered in the managers meeting included an explanation of the structure of their area, discussion about the changes that had occurred recently, the problems that their area was facing, discussion about the performance of their area and key measurements and their perceptions of what their key processes looked like. The specialists interviews focused on how the key processes actually worked.

From these interviews a series of IDEF0 diagrams which illustrate each of the key support centre processes were developed. Each process diagram was discussed with the specialists, the manager and the sponsor and revised several times accordingly.

The results of the final diagrams and findings were fed back to several management meetings. They were accepted as being very useful, particularly as the work had been carried out by an independent none IBM party. It was decided that the data collected would act as input to a cross-centre process improvement project in the call and problem handling area. Soon after the preliminary meeting had been held a new director was assigned in PSS. The project was put on hold and eventually discontinued, as changes that were introduced by the new director meant that other projects were given higher priority.

In addition to the kick off of the cross-centre process improvement project a report was submitted to the management committee in July 1996. The report detailed the results of the interviews, detailed key issues from the process diagrams and recommendations were made in the six areas of strategy, human factors, information technology, performance measures, scope of change and process architecture. It was recommended that some short term incremental

improvements were taken immediately and that long term radical improvements were worked on in the future. A few weeks prior to the submission of the report the manager of the CSS changed. The report was presented to the manager in a two hour meeting. The results were not received with enthusiasm. The new manager was unaware of the work that the researcher had carried out therefore the results were not viewed with much credibility.

As a result of submitting the management report it was decided that resources should be focused in one area. This was the Hardware Support Centre (HSC). However, in November 1996 an organisational structure and management structure change in PSS began. This restructuring meant that the HSC project was put on hold and then finally completely discontinued.

Very little has occurred as a consequence of this project as the major organisational and management changes brought with them a series of projects which superseded the Call Handling project. The initial sponsoring manager also moved to another part of IBM, so the project lost its visibility and emphasis. Several people who knew about the existence of the process diagrams and the report asked to see the documents or used them for input to their projects, but essentially the project has been archived.

Findings from Case Studies

To organise the collection of data from the case studies data was collected under four headings. These four general headings were drawn from the implementation literature and the empirical evidence which had begun to be collected. The headings were chosen as they were key areas which were important to implementation. These areas which are under particular scrutiny included:

- Human Factors such as employees involvement in change, teamworking, commitment, motivation, communication channels, training, education and morale.
- Culture aspects include the way the organisation works, organisations characteristics and habits and perspectives and perceptions about the values and beliefs.
- Project planning and management is concerned with project preparation, project management processes, methodologies and tools and techniques.
- Process based change is concerned with the changes to the current and future operation processes.

Human Factors Findings

Each of the projects have benefited from elements of teamworking. Two of the case studies had steering committees. These teams were very productive and worked together well. In each of the case studies the process changes were often complex, involving, several areas of the business, processes, people and technology. Teamworking was perceived as a very useful method of working in this type of situation.

The case studies illustrated that the steering committees had representatives from each area that would be effected by changes. This meant that different perspectives, problems and alternative options were considered.

Even though different areas of the business were represented in the steering committees, it was still felt that more user involvement in the changes needs to be gained. If more users were involved it is felt that there would be more commitment to the changes which were taking place.

Cultural

PSS has been described as being 'full of solutioning'¹⁴. The PSS division has its foundations in the customer engineering environment, this has led to 'Mr fix it' 'solution'¹⁴ driven behaviour developing.

This type of behaviour means that when a problem occurs the normal behaviour is to search for a solution immediately. In the case studies there was little time spent on examining what the fundamental problem was. Two out of the three case studies were initiated from managers ideas rather than corporate directed projects. In both the cases there was little or no assessment of whether the initiated project would fit into the overall changes in PSS. This type of behaviour has been described as 'in the bath thinking', where ideas occur, but 'time is not spent thinking up alternatives'.

It has been said that a common occurrence in IBM is to have 'too much change. IBM do not give changes a chance to produce the benefits they were intended to generate, before the next change is being introduced.'¹⁴

Each of the case studies suffered repercussions from the restructuring of the organisation. In two of the case studies the projects were put on hold whilst a new management structure was put in place and process change projects were reprioritised. In both of these cases the projects were eventually superseded by projects which were given a high priority in the reorganisation. The third case study also suffered some effects of the organisational restructuring. The commitment to the project from the management team fluctuated considerably whilst the restructuring was taking place.

Another common behaviour in PSS is to concentrate on tactical work and to do less strategic long term work. It has been said that 'PSS does not plan properly in the long run'¹⁴. With few strategic plans it is difficult 'for managers who have ideas to check they match future strategies'¹⁴. PSS tends not to take a 'broad view'¹⁴ of a problem.

Project Planning and Management

Two out of the three case studies suffered from missed deadlines, carried forward actions and slipping timescales. In two of the case studies the project goals, objective and boundaries were not formally agreed. Two of the projects were not formally run by a project manager.

Each of the case studies were effected by sponsorship problems. A couple of the case studies began with strong active management sponsorship which was subsequently lost as the manager changed. The other case study suffered with constantly varying commitment of the sponsor, as well as changing sponsors. The project did not receive the full and active sponsorship which it required which meant implementation was not successful.

One of the biggest problems with sponsorship that occur when new managers took on the role, was that they took on the responsibility in name only. The managers took on the title of sponsor, but were not actively involved and most importantly were not committed to the role or the project it related to.

Process Based Change

Two case studies have found process change that has been introduced has led to conflicts within the workforce. The employees have often been resistant and resentful of the changes

that have been introduced. In some cases where role changes have been introduced people have continued to work the way they always have.

In each of the case studies it was claimed that process reengineering was taking place. It became evident that each of the cases studies became either process mapping or process analysis projects. In particular there were many process analysis activities and few successfully implemented process changes.

The case studies took a functional view of process activities. The boundary of the process only included the activities which took place in the department. The interfaces with other departments or where the initial inputs to their processes came from or where the eventual outputs went to were not considered.

Often the processes had not been documented. Usually if a particular sequence was followed it was held in the head of the employee who carried out the process.

Discussion - Human Factors

Literature concerning the effect user involvement has on the success of implementation is conflicting. From the results collected so far it appears that user involvement is important. There is much evidence of successful teams, such as steering committees and sub project teams being used to complete projects.

There is little reference to the effect of teamworking on implementation. The results noted above have several references to the success of teamworking. Other factors which the findings above have indicated may be important to implementation include, top management commitment, training and education.

Cultural

One of the key problems to deal with is how to ensure that the project is in line with current organisation changes taking place. An assessment of the relevant organisational changes and influences could lead to a more informed decision of whether the implementation is appropriate, relevant and essential.

It is possible that an assessment of the culture of the environment and people who will be effected by a planned change could uncover issues which would otherwise not be addressed. A cultural assessment may indicate conflicts that may occur when the planned change is incompatible with the current culture. From the evidence collected there does not appear to be any assessment of the cultural situation before, during or after a change.

From the empirical evidence there appear to be various organisational cultural issues. As discussed some implementation literature recommends that an assessment of the culture should be made before a change takes place so that it is possible to see where any cultural changes may be required.

There are many methodologies available which deal with changing organisational culture. However very few of these methodologies give guidance on improving implementation of process based change.

Project Planning and Management

From these findings it is likely that a problem area concerning project planning and management is important. Elements of project planning and management are essential to keep

projects to time, ensure actions are completed on time and to assist the project in keeping to the original timescales that it was given.

It has become evident from all three case studies that top management commitment and sponsorship of the change is essential to ensure improved implementation. Consistent active sponsorship, through out the life of the project has been seen to be essential to keep motivation and morale of those involved in projects high. Commitment of the highest level of management and the management committee is more credible and preferable so that the change is completely and successfully implemented.

Process Based Change

The findings noted above illustrate that in some cases the process based change is occurring in an ad-hoc manner. In some of the projects it is unclear whether the processes are being incrementally improved or radically re-engineered. The evidence above also indicates that the process change is not clearly planned and co-ordinated with other reengineering projects which may be in progress.

There is much evidence of process analysis but little of complete implementation. Process based change does not appear to be successfully implemented, which indicates that could be an important area to deal with. In addition the literature concerning process based change is in the early stages of development, with much scope for further development.

A Framework

It is intended that a framework to help improve implementation of process based change will be developed to address the gaps identified in the literature. The framework will be validated by testing it on a fourth case study.

Authors such as Kwon and Zmud talk about the wide view of implementation being a 'young academic field'¹⁵ where our understanding is incomplete. The framework will be founded in the wider view of implementation and will aim to help develop understanding in this area. It will be created using systems concepts so that a wider view and a better understanding of the changes that are occurring at the moment should be gained. Taking a systems approach may also encourage the examination of the inter-relationships within the change and also external influences and repercussions of the change. The framework will address the human factors which have been shown to effect the success or failure of implementation, such as teamworking and user involvement. Evidence collect also indicates that organisational culture has an influence on implementation. Considerations of some elements of organisational culture will also be incorporated into the implementation framework. It is evident that project planning and management factors can influence the outcome of implementation. Project planning and management will be important to understand the problem of superseding of projects and lack of complete implementation. All these factors will be focused specifically towards the implementation of change, which is process based.

It is intended to develop a practical and useful framework which can be transferred into other organisations. The framework will have both, academic rigour and industrial relevance. The research is deeply founded in Action Research. The validity of the AR will be ensured through comparison of the research with the twelve standards for valid AR, set by Eden and Huxham¹⁶.

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A SOFT SYSTEMS APPROACH TO THE FORMULATION OF A MANUFACTURING STRATEGY

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ABSTRACT

A three year research project was carried out into the use of manufacturing strategy methods in the UK aerospace industry. The initial study suggested that current methods did not appear to be suitable for the changing structure of the industry from a predominantly functional orientation to a business process focus. The soft systems methodology was identified as an appropriate learning system to test the above preposition. Three cycles of learning were carried out using systems concepts: The first to develop three archetypal manufacturing strategy making systems, the second to describe the empirical data derived from seven cases studies and the third to develop a modified approach to the formulation of a manufacturing strategy taking into consideration the learning experienced in the first two cycles. The paper concludes with a discussion on the validation and use of the modified approach.

MANUFACTURING STRATEGY

Manufacturing strategy was identified by Skinner (1969) as an invaluable asset in developing the competitiveness of an organisation. The paper described the use of manufacturing as a "competitive weapon" which can support or shape corporate and business strategy. In the current dynamic competitive environment, it is critical to ensure manufacturing is capable of supporting the business strategy and to develop manufacturing capabilities that will enable the organisation to remain competitive, as described by Hayes and Pisano (1994). Manufacturing strategy has received increasing interest from both academics and practitioners who are continually striving to improve their operations. This can be demonstrated by the output of academic papers and the hosting of a conference in the field by the European Operations Management Association in 1996.

Several streams have emerged over the past decade which are providing researchers with real opportunities to provide the practitioner with useful and powerful concepts and techniques to enable them to develop manufacturing as a competitive weapon. These streams have been described by Whittle et al (1994) as the market led / customer focused approach, the best practice approach and the knowledge based approach to manufacturing strategy.

The market led / customer focused approach tends to deal with the order winners and order qualifiers of products and services. The approach is well developed and is grounded in empirical research by researchers such as Hill (1984), Buffa (1984), and Hayes and Wheelwright (1984). The essence of the approach is to achieve competitive advantage by satisfying the customer's needs.

The best practice approach tends to be efficiency based and has evolved from viewing the phenomenal success of Japanese organisations. The Toyota Production System (Ohno, 1988), has had a profound effect on the development and evolution of the best practice approach. The approach comprises of a plethora of philosophies which Western organisations have adopted to try to match the operational effectiveness of the Japanese. Schonberger (1996) has developed the world class manufacturing approach and this 'label' has been adopted by many

organisations wanting to emulate their competitors. The best practice approach is characterised by the large number of change programmes which encapsulate philosophies such as Business Process Re-engineering (BPR), Total Quality Management, (TQM), World Class Manufacturing and Lean Operations. The approach uses benchmarking and performance measures as the enablers to drive through change and to identify changes required. (Neely et al, 1995).

The knowledge based approach has evolved from the view that it is unlikely that an organisation can achieve sustained competitive advantage just by emulating best practice (Hayes & Pisano, 1994). The approach considers the view that an organisation should focus on the development of core competencies within their processes, people and technology to enable the development of new markets and directions. In order to sustain competitive advantage these core competencies must be difficult to replicate (Hayes & Pisano, 1994). The approach therefore focuses on the resources and assets required for learning and the development of these competencies and capabilities. The approach has recently been reintroduced to manufacturing strategy research by Hayes and Pisano (1994), Teece et al (1997) and Senge (1990) who developed the concept of 'The Fifth Discipline'. The concept of the learning organisation had been developed earlier by Argyris and Schon (1978).

The three approaches are not mutually exclusive and organisations will not necessarily focus uniquely on one approach and disregard the others. It has been useful to describe the manufacturing strategy domain in this way to bound and clarify the different aspects associated within the field. The three approaches have been described using systems concepts which are explained briefly later in the paper.

The aerospace industry has changed dramatically to respond to the market and competitive changes which have occurred over the past decade. To ensure that the remaining aerospace organisations survive, it is crucial that the operations practitioners utilise the powerful concepts that manufacturing strategy provides. It is therefore also critical to ensure that manufacturing strategy develops to tackle the challenges that evolve with them. The production and operation management practitioners should be provided with a set of concepts, tools and techniques which can assist them in the demanding task of formulating and implementing a manufacturing strategy.

EVOLUTION OF RESEARCH

The identification of Manufacturing Strategy as a powerful concept in the role of enhancing the competitiveness of the UK aerospace industry led to the development of three initial case studies. These case studies explored the current use and understanding of manufacturing strategy methods within the industry. The cases identified several issues which were considered worthy of additional analysis and helped to shape the research question set and subsequent research direction.

The case studies presented a dynamic view of manufacturing and the competitive environment within the UK aerospace environment. The empirical evidence reinforced the position that manufacturing strategy was critical in developing and improving the competitiveness of an organisation. The view was formed after considerations of the following:

The aerospace market has changed dramatically in the past decade due to several factors. The market has become increasingly more competitive whilst shrinking due to changes in defence policy and a fall then a rise in commercial traffic. The ending of the cold war changed the way procurement agencies place orders and the size of orders placed. This may be due to the

perceived threat of aggression diminishing and the procurement agencies having to justify their expenditure more vigorously. However the major implication for the defence industry is the move from 'cost plus' to 'fixed price' contracts (BAe publication, 1997). This has had a profound affect on the supply chain from the prime contractors through to the systems integrators, systems suppliers and component suppliers, which is evident from the massive restructuring programmes that have occurred in the industry. The industry had to focus on becoming more efficient and competitive in their operations if they were to compete in the global market place. Manufacturing strategy is a powerful tool that could and should be used in ensuring the industry is well placed to face the global challenge (BAe publication, 1997)

The structure of both the industry and individual organisations is changing dramatically. The functional orientations which have evolved over the past century from Taylor's (1911) experience are no longer appropriate for the dynamic global business environment the UK aerospace industry finds itself in. Organisations are still predominantly arranged with the segmentation of work into specialised functions and tasks. However the organisational development paradigm is shifting towards business process focused organisations (Mauil et al, 1995). These organisations are breaking down functional barriers and are creating a culture of processes as opposed to functions.

One of the implications of this development for manufacturing strategy is a shift in emphasis to integration of business processes and the evolution of the manufacturing strategy formulation process to take into account the structural, infrastructural and cultural changes within the manufacturing discipline and processes. Process teams will need to align their business processes with the business and corporate strategy and due to the make up of concurrent teams with different cultures, the exposure of different points of view (*weltanschauungs*) will be important to ensure that barriers to implementation of any manufacturing strategy are identified and dealt with in the formulation stage. This change in emphasis is the driving force behind the research.

THE RESEARCH QUESTION

These considerations helped to form the research question and the subsequent objectives which evolved from them.

1. Are manufacturing strategy methods and techniques currently used within the UK aerospace industry?
2. Are current manufacturing strategy methods and techniques adequate for use within the changing UK aerospace industry? (Change in focus from a function to a business process focus)
3. Are there opportunities for developing the current manufacturing strategy methods to support the evolution of UK aerospace organisations from functional orientations to a business process focus?

The following objectives were developed from the research question set to direct and focus the research.

1. To critically review current manufacturing strategy literature.
2. To determine if manufacturing strategy methods and techniques are currently used within the UK aerospace industry.
3. To identify opportunities for improvement to current manufacturing strategy methods.
4. To develop a useful tool to address any findings and problems derived from the previous objectives.

The research methodology used within the research programme evolved using Meredith et al (1989) research cycle of description, explanation and testing and Checkland and Scholes' (1990) 'Soft Systems Methodology'. Meredith's cycle was used in all phases of the research, but was initially used to develop the literature review and to produce initial findings to move the research forward. Checkland's soft systems methodology was used to develop the research in three cycles using systems concepts.

DEVELOPMENT OF KEY PRINCIPLES

The following concepts were identified as key to the research.

- The development of manufacturing within the aerospace industry.
- The development, content and process of manufacturing strategy.
- Systems theory and the business process paradigm.
- The use of the Soft Systems Methodology as a tool to learn about manufacturing strategy and to identify systemically desirable and feasible modifications to current methods
- The use of case study research.

The principles were developed using three cycles of learning using systems concepts and the soft systems methodology developed by Checkland and Scholes (1990). Cycle one identified the use of manufacturing strategy within the UK aerospace industry as a 'problem situation' which was worthy of further study. Using current literature as a starting point, three manufacturing strategy archetypes were refined using root definitions and conceptual models. The archetypes were the customer focused / market led approach, the best practice approach and the knowledge based approach to manufacturing strategy.

Cycle two explored the manufacturing strategy formulation process experiences of seven aerospace organisations and provided a base to identify changes to current manufacturing strategy methods, which would be appropriate to the aerospace industry. The outcome of this cycle indicated that the majority of cases visited were involved in a mixture of the three archetypes described with no discernible structure to enable them to reap the benefits of any one archetype or of all three archetypes. Few case organisations had a formal process by which to develop their manufacturing strategy and to keep the momentum going within their change programmes. However all recognised the need and the benefits of applying strategic thinking to their manufacturing processes. The implication of the findings was that either the current manufacturing strategy methods were not presented in a manner which was compatible to the aerospace industry's evolution or that a structured systemic method which was capable of dealing with manufacturing competitiveness within a business process focused organisation was not available.

Cycle three developed a modified approach to the formulation of a manufacturing strategy from the results of cycle one and two. The approach was developed using the soft systems methodology as a frame of reference, and the concepts of systemicity, debate and continuity. The approach draws on existing manufacturing strategy methods and evolves them into a format which is compatible with a process focused organisation, i.e. one which incorporates a business process view across traditional functions and disciplines.

The approach enables the practitioner to question the current business strategy and manufacturing's contribution to achieving the targets set in the business strategy. The approach then leads the practitioner through the process of understanding the current manufacturing organisation, assimilating data from the key stakeholders, reaching consensus

on contentious issues and producing a shared understanding of the current manufacturing operation.

The next phase develops a statement of what is expected from the manufacturing organisation, linked to the business strategy and a discussion of the appropriate manufacturing strategy archetypes which could be useful and fit their particular organisation. Objectives are developed from the manufacturing strategy statement, and relevant systems which may be people based, process based or technology based (or a mixture) are identified which will have a significant role in achieving those objectives. These systems may or may not exist at this stage. The systems identified are developed into root definitions which focus the practitioner in defining exactly what the system is to deliver. The root definition is used to develop conceptual models based on the different world views expressed by the stakeholders. These conceptual models are compared with the real world situation to identify systemically feasible and desirable changes to the current manufacturing organisation in line with the business strategy and manufacturing objectives. The mechanism chosen to deliver the approach was a facilitated workbook which was tested and validated in two organisations, using the criteria that research should be useful to practitioners within the production and operations management domain.

FINDINGS

The approach was successfully validated in two organisations through the use of discussion, focus groups and workshops. The validation played an important role in developing the usability of the approach, as the concepts underpinning the approach were designed to be useful to operations and production management practitioners. The development of a rich picture of the manufacturing operation in both organisations exposed different worldviews which were held by the key stakeholders. This was felt to be extremely beneficial in future stages of the approach when identifying the preferred direction of manufacturing and the systems required to deliver the strategy. Both organisations articulated the usefulness of the structure of the approach and the identification of relevant systems to support the business strategy and manufacturing objectives very useful. The practitioners felt that the use of systems concepts and the principles of debate, continuity and systemicity was beneficial in developing an understanding of the current manufacturing operation and the required changes to support the business strategy being followed.

RESULTS

The contribution of the work comes from the critical evaluation of existing manufacturing strategy methods and techniques. This evaluation determined that the current manufacturing strategy methods could be further developed to enable the evolving aerospace industry to meet the competitive demands they are currently facing. These opportunities for improvement were identified which were incorporated into an improved method for formulating a manufacturing strategy. The method addressed some of the issues identified.

The method makes use of three manufacturing strategy archetypes, developed using systems theory, to ensure the thinking surrounding the manufacturing strategy is made explicit and is systemic. The three archetypes have been incorporated into a manufacturing strategy meta model which describes the linkages and suggests the preferred position of each archetype in the manufacturing strategy hierarchy. The mechanism for disseminating the contribution was a workbook. The modified approach to manufacturing strategy formulation has been successfully validated on the premise of the work being useful to the practitioner and has been identified as being a useful and exciting approach to formulating manufacturing strategy. The approach was developed for use within the UK aerospace industry, however the practitioners involved in the

validation believe the approach could be useful in other sectors of industry. The approach will continue to be developed in industry.

DISCUSSION AND FUTURE RESEARCH

The modified approach developed for the formulation of a manufacturing strategy using systems concepts was well received by the industrial validators and addresses some of the concerns expressed around current manufacturing strategy methods, i.e. the exposure of different world views of the stakeholders within the manufacturing organisation, and the explicit description of the systems under consideration taking into account the people, process and technology dimensions. The approach does not solve all the issues surrounding manufacturing strategy formulation as the concept requires effort and creativity to develop a successful manufacturing strategy. The approach guides the practitioner in such a way as to question and expose the current role of manufacturing and to use systems concepts to help to formulate a way forward. The approach will be continually updated and amended through testing in other industrial sectors.

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BRITISH ACADEMY OF MANAGEMENT CONFERENCE 1998

Nash Z, Childe S, Maul R. 1998. Improving the Implementation of Process Based Change at IBM. In Proceeding of the British Academy of Management Annual Conference, September, pp116-117. NU Printers, The University of Nottingham.

Improving the Implementation of Process Based Change at IBM

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Abstract

Implementation may be defined as a complex process 'beginning with the first thought of developing a system and not ending until the user either is satisfied that he is in control of the system or has abandoned the project' (Ginzberg 1979). There is much evidence, both theoretical and empirical, to suggest that there is a high percentage of implementation failures (Meredith 1981, Lucas 1981, Walsham 1992, Land 1989).

Process based change includes information system implementation together with the human and social aspects that make up a business process. It must consider both technology and human issues, and the focus is broader than much of the earlier process implementation research which concentrated on the implementation of technology. This thinking can be applied to many company improvement projects.

Meredith (1981) and other authors (Tranfield 1994, Keen 1985) have discussed the problems surrounding implementation. Meredith noted in 1981 that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Seventeen years on from Meredith's article there is still much literature reporting on implementation issues. The empirical evidence that has been gathered so far also indicates that there is little successful implementation. It is often the case that implementation is curtailed prematurely.

To further understand what happens in an organisation when implementing process based change, a three year action research project between IBM Product Support Services (PSS) and the University of Plymouth has been conducted. PSS is primarily responsible for the maintenance of hardware and software and the selling of services associated with them. The research project focuses on process changes currently taking place within the division.

A recent paper 'Factors affecting the Implementation of Process Based Change' (Nash et al. 1998) introduced the inhibitors of implementation that have been noticed at IBM. This paper intends to present a framework which has been developed as a solution to deal with these inhibitors, in order to improve the management of implementation projects.

The framework was developed using systems theories, theoretical evidence and the findings gathered from IBM projects. The framework consists of five dominant themes, which are senior management commitment, analysis of problem situation, project management and human factors. It has not become apparent from the research that one factor is more inhibiting than another. It is more likely that the problem of unsuccessful implementation is a complex one which may only begin to be improved when all the themes are addressed together as a whole.

It is intended that the framework will be useful, practical and transferable into other organisations. It is also essential that it will be based upon both academic rigour and industrial relevance. Eden and Huxham have compiled a list of twelve contentions that must be fulfilled if the research is to be viewed as 'quality research' (Eden and Huxham 1996). In order to ensure the validity of the action research process the researcher has closely followed this framework.

Introduction

This paper reports on a joint research project between IBM UK Ltd and University of Plymouth. The researcher was based in IBM Product Support Services (PSS) for three years, where she worked as a pseudo employee. PSS is a division that is primarily responsible for the maintenance of hardware and software and the selling of services associated with them. The main aim of the research project was to investigate what happens in practice when a company implements process based changes and how these changes are approached.

Meredith(1981) and other authors (Tranfield, Keen 1981, Land et al 1989 Walsham 1993 Ginzberg, 1981, Lucas 1981, Kwon & Zmud 1987, Swanson 1988) have discussed the problems surrounding implementation. Meredith noted in 1981 that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Seventeen years on from Meredith's article there is still much literature reporting on implementation issues.

In IBM, the development of processes is often known as Business Process Re-engineering (BPR). Hammer (1990), who wrote the seminal article on BPR defines re-engineering as, 'the fundamental rethinking of business processes to achieve dramatic improvement in critical, contemporary measures of performance, such as cost, quality, service and speed.' Since 1990 when BPR first began to emerge there has been an enormous amount of literature generated on the subject. Some of the literature is concerned with reports of unsuccessful implementation (Grover et al 1995, Majchrzak & Wang 1996) for example Hammer estimated that 'between 50 and 70 percent of re-engineering efforts were not successful in achieving the desired breakthrough performance.' (Hammer 1995)

The literature on process based change and implementation and the empirical evidence gathered in IBM, seems to indicate that there is little successful implementation. It is often the case that implementation is curtailed prematurely. The main aim of the research is to develop a framework that IBM and other companies can use to improve the management of process based change implementation projects. This framework is presented below.

Implementation

Implementation is a complex concept that is found in many different disciplines, such as management science, manufacturing operations, social science and information technology.

When considering implementation it is useful to consider different authors' views and definitions of implementation. Much of the traditional implementation literature discusses technical implementation of computer systems where implementation is traditionally described as being one of the final stages in the systems life cycle. The systems life cycle (SLC) or systems development life cycle (SDLC) is a model used to identify stages in the development of a system, typically a computer system.

Ginzberg (1979) describes the traditional view of implementation as 'that part of the development cycle beginning after the system or model has been designed and built, and ending as soon as outputs are produced'. Activities which are typically included are systems programming and testing, user training and the physical change from the old to the new system.

Lucas (1981) puts forward an alternative approach to implementation as one of the final stages of systems development. This alternative approach considers implementation as being part of all stages of the systems life cycle. This view describes implementation as 'an on-going process which includes the entire development of the system from the original suggestion through the feasibility study, systems analysis and design, programming, training, conversion, and installation of the system'.

This view can be described as the 'wider view' of implementation. This view of implementation is held by authors such as Lucas(1981), Ginzberg (1979) and Meredith (1981). It is this wider view of implementation which will be used for the purpose of the research. An appropriate definition of this view of implementation is put forward by Ginzberg(1979) as 'beginning with the first thought of

developing a system, and not ending until the user either is satisfied that he is in control of the system or has abandoned the project.'

Research Methods

When choosing an appropriate research method to answer the research problem a subjective or objective philosophical perspective may be taken. A subjective perspective means that research is approached from a belief that the world is 'made up of nothing more than names, concepts and labels' (Burrell & Morgan 1979). Taking an objective approach means the world is perceived to be made up of 'hard, tangible and relatively immutable structures' (Burrell & Morgan 1979). Different methods of research should be applied depending on the basic philosophical assumptions the research is based on.

It is recognised that there are benefits of research methods from both the subjective and objective approaches to research. An epistemological stance that draws on research methods from both approaches is hermeneutics. It is a hermeneutic epistemology that has been followed during this research.

The term hermeneutics originated from Hermes the messenger of the Greek Gods. Hermeneutics is frequently described as a theory of understanding and interpretation, typically of texts and originally biblical texts. Hermeneutics is a subjective based philosophy, where the world is made up of human constructs. In hermeneutics it is believed that humans 'externalise the internal process of their minds' by creating 'cultural artifacts'. Burrell and Morgan define hermeneutics as 'interpreting and understanding the products of the human mind which characterise the social and cultural world'. There has been a move in the twentieth century towards a more phenomenological perspective to hermeneutics, where the event of understanding is analyzed itself.

A research method which is closely related to hermeneutics is action research. Gummesson (1993) describes action research as 'the most demanding and far-reaching data generating method in case-study research' (Gummesson 1993). It involves the researcher forming a relationship with an organisation. Once the researcher is placed in the host organisation there must be 'the expressed intention of both parties to be involved in change' (Checkland 1981). Rapaport provides a slightly different focus, 'Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.' (Rapaport 1997)

These requirements are met in this research by the researcher becoming a full-time member of the staff of the company, and taking a full part in the projects being investigated. This has resulted in the company and the university both owning the researcher. Thus the collaboration is ensured by the continuing presence of a university researcher as a pseudo-employee in the company.

The validity of the action research must be ensured as much as possible. Eden and Huxham (1996) have compiled a list of twelve contentions that must be fulfilled if the research is to be viewed as 'quality research'. The research will be tested against each contention to ensure the continuing sound basis for the program.

Projects

In order to build up a thorough understanding of what happens during implementation the researcher got involved in three significant process based change projects in PSS. The process changes are based around the deployment of a common set of processes that are being used in all IBM's marketing and services companies. This process change project is called Customer Relationship Management (CRM). The goals of CRM are to increase customer satisfaction, increase market share, reduce expenses and increase employee morale.

The first project was a problem identification and problem resolution project in the IBM Central Support Services (CSS). CSS are groups that assist customers when their computer systems, usually mainframes, fail. The purpose of this project was to collect information about processes that were in operation in the IBM customer support centres. It was initiated by the Solutions Delivery process owner so that a business decision about whether the processes should be re-engineered or incrementally improved could be made. This investigation was completed by two consultants, one of which was the researcher. A full

description of this project is reported in a recent paper, 'Factors affecting the Implementation of Process Based Change' (Nash et al. 1998) and in 'Implementation of Process Based Change' (Nash et al. 1997).

The second project was a process redesign project in the services development area. The project was focused on a solutions design and delivery sub process, called services development. A steering committee was formed to lead the project. The steering committee consisted of representatives from each of the sub groups that are involved in the process and two facilitators. The researcher was one of the facilitators.

The third project was a project to implement a teamworking culture across PSS. The aim of the project was to create a high performance work culture which could then be implemented across other parts of the IBM. A project manager was assigned to run the project. The researcher was assistant to the project manager, and was a member of the teamworking project team.

Results of the Projects

None of the projects were successfully implemented. Successful implementation in the context of this research refers to, complete implementation, from conception of the process change to full installation, user acceptance and use of the new process. In particular the focus is on user acceptance and use of the new system (Smith and Tranfield). The production of business benefit that had been predicted from the implementation will also be important.

In each project there was much analysis of situations and processes, but little design and complete successful implementation. Employees did not change the way they worked, they continued to use the old processes and procedures. The new processes were not adopted and accepted completely in any of the projects.

Typically projects suffered with inconsistent senior management commitment and sponsorship. Active commitment to the projects was rarely demonstrated and sponsorship was often inconsistent. In some cases the person acting as sponsor actually changed or their level of commitment to the project varied. Generally at the beginning of the project the sponsor would attend team meeting and complete his assigned actions. This level of involvement decreased throughout the life of the project.

Two of the projects lacked a formal project planning and management structure e.g. a project manager was not assigned to run the project, no project objectives or plan were in place. The lack of project management meant that the projects had not been coordinated with other relevant projects, or with the PSS business direction and strategy.

Usually projects would evolved from a manager's perception that a current process needed improving. These assumption were accepted as accurate and generally little problem investigation was carried out. Relatively no assessment of alternative approaches to solving the problem were considered. This lack of initial problem investigation meant that the fundamental problem situation was not defined at the beginning of the project.

At the beginning of November 1996 PSS underwent a major management reorganisation. The projects were put on hold until the new strategy for PSS had been confirmed. The projects were eventually discontinued as they were superseded by other projects that were perceived to be more inline with the new management strategy for PSS. The lack of formal project management, inadequate investigation of the initial problem and inconsistent sponsorship may have influenced these decisions.

Enhancing Findings

From the project findings and the literature review several factors crucial for successful implementation were beginning to emerge. In order to increase the understanding of these factors and the problems faced in PSS when implementing process based change, two focus groups and six semi-structured interviews were conducted.

A focus group may be described as 'a form of group interview in which the data arise from dialogue and general discussion among participants, rather than from a dialogue between yourself as investigator and

a single person as respondent' (Kraut 1996). Focus groups were chosen as a method to broaden the understanding of process change projects in PSS as they are relatively cheap to run, generate many perspectives and enhance qualitative findings on the chosen topic (Kruger 1994).

Two half day focus groups were held. Four or five key professionals closely involved in process changes in PSS attended each group. The areas of discussion focused on the attributes of successful and unsuccessful projects. Questions included what worked, what didn't work and what should have been done differently in these projects?

Semi-structured interviews were held with the sponsors of each of the three research projects. The findings from their projects were discussed, developed and enhanced. General interviews were held with another three employees who were heavily involved in the process improvements activities in PSS. Their perceptions of what worked, didn't work and what should have been done differently in PSS process change projects were collected. Valuable insights into possible reasons for process changes taking place in the way they did and having the results they did were gathered. The research was greatly enhanced and substantiated from these interviews and focus groups.

Analysis

In order to develop the framework to improve implementation of process changes the findings from the projects, focus groups and interviews were analysed. One method of analysing qualitative research findings that is recommended (Lofland and Lofland 1995, Miles and Huberman 1994, Krueger 1994) is coding. This is the method of analysis that was employed in this research.

The project findings, interviews and focus groups transcripts were input into a computer database. From this database each phrase or paragraph was assigned a code by the researcher. Phrases or paragraphs of a similar subject were then grouped together under the same code or theme. The purpose of bringing together similar data was to allow the dominant themes that effect implementation to emerge.

As the coding progressed the various themes developed. Some themes were expanded or adapted, useful themes were focused on whilst less useful ones were abandoned. From the process of analysis five dominant themes emerged. These themes formed the foundation of the framework to help improve the management of process based change implementation.

Lofland and Lofland (1995) recommend that after coding the themes are 'memoed'. Memoing involves developing a detailed explanation of what the codes are about how they relate to each other. They also suggested that a diagrammatic representation of the themes is created, so that the themes and their relationships can be explained in a succinct fashion.

Themes of the Framework

A detailed explanation of each theme (memo) and a diagram to illustrate the themes and their relationship was developed as suggested by Lofland and Lofland.

The concept of a framework to improve the implementation of process based change was based upon the five themes that emerged as being crucial for successful implementation. These five themes as illustrated below are, senior management commitment, analysis of the problem situation, user involvement, process based change and project planning and management.



Figure 1: Framework for Improving the Implementation of Process Based Change

Figure 1: Framework for Improving the Implementation of Process Based Change helps to illustrate that it is not one theme that is more inhibiting to implementation than another. It is more likely that the problem of unsuccessful implementation is a complex one, which has a systemic property that may only begin to be improved when all themes are addressed together.

An explanation of what is meant by each theme and a brief summary of where each theme evolved from follows.

Senior Management Commitment

The senior management commitment theme is about ensuring that the relevant high level management are committed to the project and are willing to demonstrate their commitment by active involvement. This theme is also concerned with assigning a committed and active sponsor who will provide consistent support throughout the complete process implementation.

Each of the research projects was affected by sponsorship problems. Two of the projects began with strong active management sponsorship which was subsequently lost when the manager changed. The other project suffered with varying commitment of the sponsor, as well as changing sponsors. A significant problem with sponsorship was that often a manager took on the responsibility in name only; the managers took on the title of sponsor, but were not actively involved and most importantly were not committed to the role or the project it related to. The projects lacked clear, consistent and committed sponsorship to ensure complete implementation.

Analysis of Problem Situation

The analysis of the problem situation theme aims to ensure that the problem situation and alternative methods of problem solving are investigated more thoroughly at the beginning of a project. This includes looking at the project within the context of other changes which are occurring.

A common description of PSS was as being 'full of solutioning'. The PSS division has its foundations in the customer engineering environment, which has led to behavior described as 'Mr Fix-it' or 'solution driven'. This means that when a problem occurs the normal behaviour is to search for a solution immediately. In each of the projects there was little time spent on examining the nature of the fundamental problem. Two of the projects were initiated from managers' perceptions of problems rather than being driven by corporate strategy. In both the cases there was little or no assessment of whether the initiated project would be affected by, or would affect other changes in PSS. This type of behaviour was described as 'in the bath thinking', where ideas occur, but time is not spent on thinking the situation through.

User Involvement

The user involvement theme is predominantly concerned with ensuring employees, directly and indirectly affected by change are involved in the project.

Two of the case studies were run by a steering committee that had representatives from each group of users affected by the proposed changes. The employees included in the steering committees worked together as teams. These teams were very productive and worked together well. In each of the projects the process changes were complex, involving several departments, different processes and different information systems. Teamworking was perceived as a very useful method of working in this type of situation. Different perspectives and alternative options to situations were always considered before consensus decisions were made.

Even though different areas of the business were represented in the steering committees, it was noted that user involvement in the changes could be encouraged to a greater extent. If more users were involved it was felt that there would be more commitment to the changes that were taking place.

In all of the projects the internal communication between those directly involved in the projects was usually very effective. However, external communication to those who were affected by the project but not directly involved in the project team was not always consistent or regular. Where communication was not sufficient, employees were not always committed to the project and could be resistant to the changes.

Process Based Change

The process based change theme is concerned with ensuring that true process change is occurring. In each of the projects it was claimed that process re-engineering was taking place. It became evident that the projects were process mapping or process analysis rather than radical redesign. In particular there was much process analysis and few successfully implemented process changes.

It was often the case that the whole process was not being investigated. A departmental view of process activities was usually taken where, the process boundary only included the activities which took place within the department. Interfaces with other departments, the sources of initial inputs to the processes or the receivers of the eventual outputs were not usually considered. Often there was little co-ordination of process change projects. Generally there was little known about other process changes that were occurring in PSS.

Project Planning and Management

The project planning and management theme is concerned with the project management methodologies, tools and techniques which can be employed to manage the progress of a project.

This theme developed from evidence that suggested where projects did not have a formal, agreed project planning and management system in place, actions and deadlines were missed and the project fell behind its planned timescales. Two of the researched projects were not run by a project manager and were not formally organised as projects. The lack of formal project management meant that there was no discipline to develop a business case in support of the project. Not having a formal business case meant that when organisational changes were introduced there was no agreed business reason for the existence of the project. This meant it was easy for the project to be suspended. Where the projects goals, objectives and boundaries were not formally agreed, the projects suffered from missed deadlines, carried forward actions and slipping timescales. Alternatively one project used formal project management techniques. Actions were completed on time and to budget.

Tools of the Framework

The themes that should be considered when implementing a process change have been described above. To ensure that each of these themes are considered from the beginning to the end of a project two key activities/tools have been developed. These activities are a focus group and a Process Based Change Implementation Audit Questionnaire.

It is intended that the tools should be used by someone who will be involved in the project to its completion. This could be a project manager, project team facilitator, team leader or project sponsor.

It is very important to note that these tools are not a stand alone solution to improving implementation. They support the framework in providing a method to address the factors that inhibit implementation together as a whole, from process change conception to complete successful implementation. In order to ensure the factors of the framework are addressed throughout the life of a project it is recommended that the framework and its tools should be used in conjunction with a formal project management system.

Focus Group

The purpose of the focus group is to understand the address the themes of the framework within the context of the particular problem situation being investigated. Setting the framework in context includes, gaining an understanding of to what extent each theme is important and what specifically, it is about each theme that is important. If for example, it is unclear who the project sponsor was for a project, it would be very important to focus on the senior management commitment theme. Alternatively if a project management structure were already in place, with formal project planning and management standard to follow, then the project planning and management theme would be less important to focus on.

The focus group should be a facilitated session which should take place over a day. The attendees to the workshop should, at the very least be the project owner, project sponsor (possibly the same person), a key user or specialist in the problem situation being investigated and the project manager. The focus group should be a facilitated session which should take place over a day. The main purpose is to gain the commitment to the project to investigate the problem situation from the key stakeholders. The key stakeholders of the project are people to whom getting the project completed is most important and valuable. Examples of stakeholders may be a senior manager involved in the problem situation, specialists and key users in the area.

The agenda for the focus group could follow this example format to ensure all themes of the framework are addressed. The facilitator should navigate the focus group attendees through this agenda.

- Introduction - (Project Sponsor and Process Owner)
- The Problem
- The Goal of the Project
- Scope of the Project
 - People
 - ~ User Involvement
 - ~ Senior Management Commitment
 - Process
 - Systems
- Project Management System
- Feedback

Focusing a discussion around the problem and a goal for the project is aimed at addressing the analysis of the problem situation. This helps gather as much information about the problem situation and alternative methods of solving the problem as possible. The facilitators questions could include:

- What is the problem we are investigating?
- How should this problem be investigated?
- Who should do this investigation?
- What other projects will be affected by this project and which projects will have an effect on this problem?
- What methods of problem solving could be used for this project?
- What would be a good way to measure the success of this investigation?
- What should the goal of this project be?

A discussion about the scope of project helps examine what people, processes and systems are directly and indirectly effected and involved in the process change. This will help to define a boundary around the project for what is and what is not included.

The discussion about the people who are directly involved in the project is aimed at identifying employees who are likely to become a project team and how they will be involved in the project. By addressing who will be indirectly affected by the process change the topic of user involvement should be addressed further. Questions that the facilitator may ask, could include:

- Who should be directly involved in the project?
- Who will be affected by the project?
- How could we involve people directly?
- How could we involve people indirectly affected by the project?
- How could we measure the success of the direct involvement?
- How could we measure the success of the indirect involvement?
- Is there anything else in your experience that has worked well to get the people directly or indirectly involved?

The questions about senior management commitment are aimed at identifying exactly which senior managers commitment needs to be gained to ensure the project receives the relevant funding and resources it needs to be a success. It is also important to confirm who the sponsor of project is. The sponsors commitment to lead the project through to complete successful completion should be obtained. Relevant questions could be:

- Who should be the owner of the project?
- Who should be the sponsor of this project?
- Is there anybody else who needs to show commitment to this project?
- How do you think sponsorship should be demonstrated?
- How do you think ownership should be demonstrated?
- How do you think management commitment should be demonstrated?
- How can we measure the commitment/sponsorship/ownership?
- Is there anything else that has worked well in the past in sponsorship/management commitment/ownership?

Focus group questions about the processes should identify what the end to end process under investigation is and what activities it involves. It is also useful to understand what processes provide inputs and receive outputs from this process. Appropriate questions could be:

- What is the E-2-E process under investigation?
- What activities does the process involve?
- Who should be investigating/designing this process?
- How should we measure the process?
- Is there anything else that you have seen working in a process redesign project?

The systems discussion should focus on other IS and IT project that will be affected by the project IS or IT systems which will be involved in the change or affected by the change. These questions are concerned with understanding the problem situation as thoroughly as possible. Typical questions could be:

- What IT/IS are involved in this project?
- What systems are affected by this project?
- How are they going to be involved?
- Who should be responsible for their involvement?
- How are we going to measure the success of this involvement?

The project management system discussion directly addresses the issue of putting a formal project management systems in place. Here the need for planning the project right through to completion should be stressed. Relevant questions could be:

- What would you like the PM system to include?
- What sort of timescales would you like to see for this project?
- Who would you like to be responsible for it?
- How should we measure the success of this system?
- Is there anything else from your experience that works well in a PM system?

Feedback should be asked from each attendee so that the focus group process can be improved. This can be asked for in the meeting, or a feedback request form could be distributed after the meeting via an email request. Typical feedback questions are:

- What worked well in the meeting?
- What did not work well in the meeting?
- What would you do differently with the meeting?
- What worked well with the meeting process that was followed?
- What did not work about the meeting process that was followed?
- What would you have done differently with the meeting process?

The information should be used as input to the project start up meeting. The results of the focus group should be distributed to the attendees of this meeting. This meeting should be part of the formal project management system, where the project goal, objectives, boundaries, timescales, risks, assumptions and dependencies are agreed. Discussion about this type of meeting should arise in the focus group.

Questionnaire

The questionnaire was designed to ensure that all themes of the framework continue to be considered as the project progresses. The purpose of this questionnaire is to identify areas in a project that may need some additional work or attention. Where the analysis of the questionnaire shows there may be some inadequately developed areas, then these areas can be worked on by the project team.

Questionnaire Design

Seventy seven questions were designed to inquire about each aspect of the framework. Several questions were developed per theme so that all aspects of the theme were explored. The questions were focused in areas that were found to be important in the focus group.

A five point Likert (Chisnall 1992) scale was chosen to measure the opinions of the respondents. The possible responses that could be chosen for each question ranged from one to five. One indicated a strong disagreement to the question and five indicated a strong agreement with the question.

Data Collection

The intended audience for the questionnaire are each of the employees who are closely involved and affected by the process change. The questionnaires could be distributed and collected in via email, or by post.

The raw data should be collected from each of the respondents. The scores allocated to each question should be entered into a spreadsheet, for ease of data manipulation. The questions were categorized in the spreadsheet according to which of the five themes noted above they related.

Questionnaire Analysis

Analysis of the responses should be carried out by question and respondent. Each question should be analysed individually and each group of questions that relate to a theme should be analysed together.

Analysis by respondent, such as average response per theme and over the whole questionnaire is important. This analysis will indicate if there were any patterns in the responses from the different groups surveyed. For example differences of opinions between different user groups or project team and management could be indicated.

The type of statistical analysis applied to the results will depend on the number of respondents. Where the number of respondents is low (less than 30) then simple statistical analysis will be more appropriate such as mean and standard deviation from the mean. A typical result from this kind of analysis could be a mean response for a theme or question closer to five. The theme or question has a more favorable result which should indicate that it has been addressed more thoroughly and may require less additional attention. Where a larger sample size have been surveyed more sophisticated multivariate analysis can be used, such as factor analysis.

Where the number of respondents to the survey was small it was important that additional statistical measures are used to analyse the raw data. The variance of the response for each question could be calculated. A high variance score would indicate that there was little consistency in the responses offered. This could indicate either a badly worded question which should be edited or rewritten or a complete difference in opinion which may need investigating.

Once the questionnaire has been run and the responses collected and analysed, the results should be fed-back to the project team. The project team should further analyse the results. Where necessary actions to improve the situations where a question or theme scored a low average or a high variance in response should be created.

It is most likely that the questionnaire will have to be carried out on several occasions as the project progresses. The format of the questions may have to change depending on the stage of the project e.g. questions may have to be tailored to different respondents depending on who is involved in the project at the time, or if the questionnaire is run near the end of project, questions that refer to initial analysis of the problem situation may have to be removed or tailored. This will ensure that the framework is considered throughout the implementation of the project.

Questionnaire Validity

The questionnaire has been analysed for its internal validity. Internal validity checks that the responses given to the questions are consistent and that the questions asked cover the intended subject area thoroughly. A widely used statistical measure of the internal consistency of a multi-item scale is Cronbach's Alpha (DeVellis 1991).

Possible alpha scores are between 1 and 0. Higher scores indicate good quality of the questions. This means the questions are more likely to have covered the subject area in depth and responses to questions are consistent. Scores over 0.7 show good reliability and scores over 0.8 indicate very good reliability. The Implementation Audit Questionnaire alpha scores ranged from 0.74 to 0.85. The alpha score for the questionnaire would have to be recalculated if the proforma questionnaire is altered.

Current and Future Work

The researcher has been testing the framework and its tools since on a fourth project in IBM PSS. The project has been running since January 1998. The framework and tools have been modified considerably in this time. Feedback from users of the framework indicates that the application of the focus group and questionnaire have been very helpful. The project has been well planned and was thoroughly thought through in the beginning. Awareness has been raised and consideration has been raised on all themes of the framework, throughout the project so far.

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**BUSINESS INFORMATION TECHNOLOGY CONFERENCE PAPER
1998**

**NASH Z, CHILDE S. 1998. A Framework for Implementation Success. In R
Hackney (editor) proceedings of the Business Information Management
Adaptive Futures Conference. Manchester Metropolitan University,
Manchester, UK**

**This paper differs to the conference proceedings as the wrong paper was
submitted to the conference .**

A Framework for Implementation Success

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Introduction

This paper reports on a joint research project between IBM UK Ltd and University of Plymouth. The researcher was based in IBM Product Support Services (PSS) for three years, where she worked as a pseudo employee. PSS is a division that is primarily responsible for the maintenance of hardware and software and the selling of services associated with them. The main aim of the research project was to investigate what happens in practice when a company implements process based changes and how these changes are approached.

Meredith(1981) and other authors (Tranfield, Keen 1981, Land et al 1989, Walsham 1993, Ginzberg 1979, Lucas 1981, Kwon & Zmud 1987, Swanson 1988) have discussed the problems surrounding implementation. Meredith noted in 1981 that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Seventeen years on from Meredith's article there is still much literature reporting on implementation issues.

In IBM, the development of processes is often known as Business Process Re-engineering (BPR). Hammer (1990), who wrote the seminal article on BPR defines re-engineering as, 'the fundamental rethinking of business processes to achieve dramatic improvement in critical, contemporary measures of performance, such as cost, quality, service and speed.' Since 1990 when BPR first began to emerge there has been an enormous amount of literature generated on the subject. Some of the literature is concerned with reports of unsuccessful implementation (Grover et al 1995, Majchrzak & Wang 1996) for example Hammer estimated that 'between 50 and 70 percent of re-engineering efforts were not successful in achieving the desired breakthrough performance.' (Hammer 1995)

The literature on process based change and implementation and the empirical evidence gathered in IBM, seems to indicate that there is little successful implementation. It is often the case that implementation is curtailed prematurely. The main aim of the research is to develop a framework that IBM and other companies can use to improve the management of process based change implementation projects. This framework is presented below.

Implementation

'Many authors refer to implementation only as the final stage in the systems life cycle' (Lucas 1981). Activities which are typically included are systems programming and testing, user training and the physical change from the old to the new system.

Lucas (1981) puts forward an alternative approach to implementation as one of the final stages of systems development. This alternative approach considers implementation as being part of all stages of the systems life cycle. This view describes implementation as 'an on-going process which includes the entire development of the system from the original suggestion through the feasibility study, systems analysis and design, programming, training, conversion, and installation of the system'.

This 'wider view' of implementation is held by authors such as Lucas(1981), Ginzberg (1979) and Meredith (1981). It is this wider view of implementation that has been used for the purpose of the research. An appropriate definition of this view of implementation is put forward by Ginzberg(1979) as 'beginning with the first thought of developing a system, and not ending until the user either is satisfied that he is in control of the system or has abandoned the project.'

Projects

In order to build up a through understanding of what happens during implementation the researcher became involved in three significant process based change projects in PSS. The process changes are based around the deployment of a common set of processes that are being used in all IBM's marketing and services companies. This process change project is called Customer Relationship Management (CRM). The goals of CRM are to increase customer satisfaction, increase market share, reduce expenses and increase employee morale.

The first project was a problem identification and problem resolution project in the IBM Central Support Services (CSS). CSS are groups that assist customers when their computer systems, usually mainframes,

fail. The purpose of this project was to collect information about processes that were in operation in the IBM customer support centres. It was initiated by the Solutions Delivery process owner so that a business decision about whether the processes should be re-engineered or incrementally improved could be made. This investigation was completed by two consultants, one of which was the researcher. A full description of this project is reported in a recent paper, 'Factors affecting the Implementation of Process Based Change' and in 'Implementation of Process Based Change'(Nash et al. 1997 and 1998).

The second project was a process redesign project in the services development area. The project was focused on a solutions design and delivery sub-process, called services development. A steering committee was formed to lead the project. The steering committee consisted of representatives from each of the sub groups affected by the process change and two facilitators. The researcher was one of the facilitators.

The third project was a project to implement a teamworking culture across PSS. The aim of the project was to create a high performance work culture which could then be implemented across other parts of the IBM. A project manager was assigned to run the project. The researcher was assistant to the project manager, and was a member of the teamworking project team.

Results of the Projects

None of the projects were successfully implemented. Successful implementation in the context of this research refers to; complete implementation, from conception of the process change to full installation, user acceptance and use of the new process. In particular the focus is on user acceptance and use of the new system (Smith and Tranfield). The production of business benefit that had been predicted from the implementation will also be important.

In each project there was much analysis of situations and processes, but little design and complete successful implementation. Employees did not change the way they worked, they continued to use the old processes and procedures. The new processes were not adopted and accepted completely in any of the projects.

Typically projects suffered with inconsistent senior management commitment and sponsorship. Active commitment to the projects was rarely demonstrated and sponsorship was often inconsistent. In some cases the person acting as sponsor actually changed or their level of commitment to the project varied. Generally at the beginning of the project the sponsor would attend team meeting and complete assigned actions. This level of involvement decreased as the project progressed.

Two of the projects lacked a formal project planning and management structure, either a project manager was not assigned to run the project, or no project objectives or plan were in place. The lack of project management meant that the projects had not been coordinated with other relevant projects, or with the PSS business direction and strategy. Lack of formal project management also meant that often a business case was not developed. It was noted that not having a formal business case meant that when organisational changes were introduced there was no agreed business reasons for the existence of the project. This meant it was easy for the project to be suspended. The projects goals, objective and boundaries were not formerly agreed; that may have led to the projects suffering from missed deadlines, carried forward actions and slipping time-scales.

Usually projects would evolve from a manager's perception that a current process needed improving. These assumptions were accepted as accurate and generally little problem investigation was carried out. Relatively no assessment of alternative approaches to solving the problem were considered. This lack of initial problem investigation meant that the fundamental problem situation was not defined at the beginning of the project.

Each of the projects has benefited from elements of teamworking. Two of the projects had project teams. These teams were very productive and worked together well. In each of the projects the process changes were often complex, involving several areas of the business, processes, people and technology. Teamworking was perceived as a very useful method of working in this type of situation. Working in teams also meant that different perspectives, problems and alternative options were considered.

It has been said that a common occurrence in IBM is to have 'too much change. IBM do not give changes a chance to produce the benefits they were intended to generate, before the next change is being introduced'. Each of the projects suffered repercussions from the restructuring of the organisation. The constant environment of change meant that when a new project was introduced, it was viewed with scepticism, or as the latest 'fad'. There appeared to be a perception that if the new concept were ignored, it would eventually

disappear and work could be done in the way it always had been. This perception made it very difficult to generate commitment to the project.

User involvement was encouraged in each of the projects. For example, all of the projects had representatives from each group of users who were affected by changes. However, in each project it was noted that user involvement in the changes could have been encouraged to a greater extent. If more users were involved it was felt by the sponsors that there would have been more commitment to the changes that were taking place.

In all of the projects the communication internally between those directly involved in the projects was usually very thorough. External communication to those who were affected by the project but not directly involved on the project team was not always consistent or regular. Where communication was not sufficient employees did not know about the project work, so were not always committed to the project and could be resistant to the changes.

The projects were eventually discontinued as they were superseded by other projects that were perceived to be more inline with new management strategy for PSS. The lack of formal project management, limited time people could dedicate to the projects, inadequate investigation of the initial problem and inconsistent sponsorship were fundamental reasons why the projects were discontinued.

Enhancing Findings

From the project findings and the literature review several factors crucial for successful implementation were beginning to emerge. In order to increase the understanding of these factors and the problems faced in PSS when implementing process based change, two focus groups and six semi-structured interviews were conducted.

Two half day focus groups were held. A focus group may be described as 'a form of group interview in which the data arise from dialogue and general discussion among participants, rather than from a dialogue between yourself as investigator and a single person as respondent' (Kraut 1996). Focus groups were chosen as a method to broaden the understanding of process change projects in PSS. Four or five key professionals closely involved in process changes in PSS attended each group. The areas of discussion focused on the attributes of successful and unsuccessful projects. Questions included what worked, what didn't work and what should have been done differently in these projects?

Semi-structured interviews were held with the sponsors of the three research projects and three employees heavily involved in the process improvements activities in PSS.

The interview process that was followed was similar to that of Isabella (1990). Each interview lasted one and a half to two hours. The interview began by gathering information about the interviewees career background and current role. The sponsors were asked what they felt worked and did not work about the project. The researcher's findings from the research projects were then discussed and developed. The process change professionals were asked the same set of questions about their experiences of process changes they have had been involved in. Their opinions of what worked, didn't work and what should have been done differently in PSS process change projects were collected.

Interviewees were asked for specific examples to illustrate their thoughts and ideas and to increase the researcher's understanding. Questions used included "what was the consequence of this.....?" "How did this affect.....?" These questions were used to 'elicit rich details and graphic descriptions or to learn why observations were important to interviewees' (Isabella 1990). At the end of the interviews the interviewees were asked if there was anything else of significance that affected process change that had not been covered already.

Valuable insights into possible reasons for process changes taking place in the way they did and having the results they did were gathered. The research was greatly enhanced and substantiated from these interviews and focus groups.

Grounded Theory

The fourth Eden and Huxham (1996) contention highlights the fact that action research is more useful for theory generating than theory testing. This research has concentrated on theory generation. As recommended by Eden and Huxham, the method that has been used to develop theory from this empirical research (such as summarised above) is 'grounded theory'. The founders of 'grounded theory', Glaser and Strauss (1967) define this as the 'discovery of theory from data'.

The development of grounded theory evolved from Glaser and Strauss's perception that there was an 'embarrassing gap between theory and empirical research'. The aim of grounded theory is to develop theory from empirical evidence. As summarised by Partington (1998) developing theory in this way should lead to development of a useful theory that; fits the real world, works in different contexts, is relevant to those involved in the situation and is modifiable to different situations and new instances.

The two main activities of generating theory are, focusing data collection into areas that are relevant to the emerging theory and constantly comparing analysed and coded data (Partington 1998, Isabella 1990). These activities are described by Isabella as requiring 'that data and theory be constantly compared and contrasted throughout the data collection and analysis process.'

Analysis

In order to develop the framework to improve implementation of process changes the findings from the projects, focus groups and interviews were analysed. One method of analysing qualitative research findings that is recommended (Lofland and Lofland 1995, Miles and Huberman 1994, Krueger 1994) is coding. This method of analysis was used in the research.

The project findings, interviews and focus groups transcripts were loaded into a computer database. From this database each phrase or paragraph was assigned a code by the researcher. Phrases or paragraphs of a similar subject were then grouped together under the same code or theme. The purpose of bringing together similar data was to allow the dominant themes that effect implementation to emerge.

As the coding progressed the various themes developed. Some themes were expanded or adapted, useful themes were focused on whilst less useful ones were abandoned. From the process of analysis five dominant themes emerged. These themes formed the foundation of the framework to help improve the management of process based change implementation.

Themes of the Framework

The data analysis appeared to show that it was more likely that the problem of unsuccessful implementation was complex, with a systemic property that may only begin to be improved when all the themes are addressed together. The implementation framework intends to address this idea.

The concept of a framework to improve the implementation of process based change was based upon the five themes that emerged as being crucial for successful implementation. These five themes are, senior management commitment, analysis of the problem situation, user involvement, process focus and project planning and management.

Senior Management Commitment

The senior management commitment theme is about ensuring that the relevant high level management are committed to the project and are willing to demonstrate their commitment by active involvement. This theme is also concerned with assigning a committed and active sponsor who will provide consistent support throughout the complete process implementation.

Each of the research projects was affected by sponsorship problems. Two of the projects began with strong active management sponsorship which was subsequently lost when the manager changed. The other project suffered with varying commitment of the sponsor, as well as changing sponsors. A significant problem with sponsorship was that often a manager took on the responsibility in name only; the managers took on the title of sponsor, but were not actively involved and most importantly were not committed to the role or the project it related to. The projects lacked clear, consistent and committed sponsorship to ensure complete implementation.

Analysis of Problem Situation

The analysis of the problem situation theme aims to ensure that the problem situation and alternative methods of problem solving are investigated more thoroughly at the beginning of a project. This includes looking at the project within the context of other changes which are occurring.

A common description of PSS was as being 'full of solutioning'. The PSS division has its foundations in the customer engineering environment, which has led to behavior described as 'Mr Fix-it' or 'solution driven'. This means that when a problem occurs the normal behaviour is to search for a solution immediately. In each of the projects there was little time spent on examining the nature of the fundamental problem. Two of the projects were initiated from managers' perceptions of problems rather than being

driven by corporate strategy. In both the cases there was little or no assessment of whether the initiated project would be affected by, or would affect other changes in PSS. This type of behaviour was described as 'in the bath thinking', where ideas occur, but time is not spent on thinking the situation through.

User Involvement

The user involvement theme is predominantly concerned with ensuring employees, directly and indirectly affected by change are involved in the project.

Two of the case studies were run by a steering committee that had representatives from each group of users affected by the proposed changes. The employees included in the steering committees worked together as teams. These teams were very productive and worked together well. In each of the projects the process changes were complex, involving several departments, different processes and different information systems. Teamworking was perceived as a very useful method of working in this type of situation. Different perspectives and alternative options to situations were always considered before consensus decisions were made.

Even though different areas of the business were represented in the steering committees, it was noted that user involvement in the changes could be encouraged to a greater extent. If more users were involved it was felt that there would be more commitment to changes taking place.

In all of the projects the internal communication between those directly involved in the projects was usually very effective. However, external communication to those who were affected by the project but not directly involved in the project team was not always consistent or regular. Where communication was not sufficient, employees were not always committed to the project and could be resistant to the changes.

Process Based Change

The process based change theme is concerned with ensuring that true process change is occurring. In each of the projects it was claimed that process re-engineering was taking place. It became evident that the projects were process mapping or process analysis rather than radical redesign. In particular there was much process analysis and few successfully implemented process changes.

It was often the case that the whole process was not being investigated. A departmental view of process activities was usually taken where, the process boundary only included the activities which took place within the department. Interfaces with other departments, the sources of initial inputs to the processes or the receivers of the eventual outputs were not usually considered. Often there was little co-ordination of process change projects. Generally there was little known about other process changes that were occurring in PSS.

Project Planning and Management

The project planning and management theme is concerned with the project management methodologies, tools and techniques which can be employed to manage the progress of a project.

This theme developed from evidence that suggested where projects did not have a formal, agreed project planning and management system in place, actions and deadlines were missed and the project fell behind its planned timescales. Two of the researched projects were not run by a project manager and were not formally organised as projects. The lack of formal project management meant that there was no discipline to develop a business case in support of the project. Not having a formal business case meant that when organisational changes were introduced there was no agreed business reason for the existence of the project. This meant it was easy for the project to be suspended. Where the projects goals, objectives and boundaries were not formally agreed, the projects suffered from missed deadlines, carried forward actions and slipping timescales. Alternatively one project used formal project management techniques. Actions were completed on time and to budget.

Tools of the Framework

The themes that should be considered when implementing a process change have been described above. To ensure that each of these themes are considered throughout the project two key tools have been developed. These activities are a project definition focus group and a Process Based Change Implementation Audit Questionnaire.

It is intended that the tools should be used by someone who will be involved in the project to its completion. This could be a project manager, project team facilitator, team leader or project sponsor.

It is very important to note that these tools are not a stand alone solution to improving implementation. They support the framework in providing a method to address the factors that inhibit implementation together as a whole, from process change conception to complete successful implementation. In order to ensure the factors of the framework are addressed throughout the life of a project it is recommended that the framework and its tools should be used in conjunction with a formal project management system.

Focus Group

The purpose of the focus group is to understand and address the themes of the framework within the context of the particular problem situation being investigated. Setting the framework in context includes, gaining an understanding of to what extent each theme is important and what specifically, it is about each theme that is important. If, for example, it is unclear who the project sponsor was for a project, it would be very important to focus on the senior management commitment theme. Alternatively if a project management structure were already in place, with formal project planning and management standard to follow, then the project planning and management theme would be less important to focus on.

The focus group should be a facilitated session which should take place over a day. The attendees to the workshop should, at the very least be the project owner, project sponsor (possibly the same person), a key user or specialist in the problem situation being investigated and the project manager. The focus group should be a facilitated session which should take place over a day. The main purpose is to gain the commitment to the project to investigate the problem situation from the key stakeholders. The key stakeholders of the project are people to whom getting the project completed is most important and valuable. Examples of stakeholders may be a senior manager involved in the problem situation, specialists and key users in the area.

The agenda for the focus group could follow this example format to ensure all themes of the framework are addressed. The facilitator should navigate the focus group attendees through this agenda.

- Introduction - (Project Sponsor and Process Owner)
- The Problem
- The Goal of the Project
- Scope of the Project
 - People
 - ~ User Involvement
 - ~ Senior Management Commitment
 - Process
 - Systems
- Project Management System
- Feedback

Each item on the focus group agenda is aimed at addressing a different theme or sub-theme of the framework. For each item on the agenda a set of questions has been suggested. For example, focusing discussion around the problem and goal of the project is aimed at addressing the analysis of the problem situation. This will help to gather as much information about the problem situation and alternative methods of solving the problem as possible. The facilitators questions should include:

- What is the problem we are investigating?
- How should this problem be investigated?
- Who should do this investigation?
- What other projects will be affected by this project and which projects will have an effect on this problem?
- What methods of problem solving could be used for this project?
- What would be a good way to measure the success of this investigation?
- What should the goal of this project be?

Suitable questions that may be used for the remaining items on the agenda can be seen in appendix.

The information should be used as input to the project start up meeting. The results of the focus group should be distributed to the attendees of this meeting. This meeting should be part of the formal project management system, where the project goal, objectives, boundaries, timescales, risks, assumptions and dependencies are agreed. Arrangements for this type of meeting should be bought up in the focus group if they don't arise naturally.

Questionnaire

A questionnaire was designed to ensure that all themes of the framework continue to be considered as the project progresses. The purpose of this questionnaire is to identify areas in a project that may need some additional work or attention. Where the analysis of the questionnaire shows there may be some inadequately developed areas, then these areas can be worked on by the project team.

Questionnaire Design

Seventy seven questions were designed to inquire about each aspect of the framework. Several questions were developed per theme so that all aspects of the theme were explored. The questions were focused in areas that were found to be important in the focus group.

A five point Likert scale was chosen to measure the opinions of the respondents. The possible responses that could be chosen for each question ranged from one to five. One indicated a strong disagreement to the question and five indicated a strong agreement with the question.

Data Collection

The intended audience for the questionnaire are each of the employees who are closely involved and affected by the process change. The questionnaires could be distributed and collected in via email, or by post.

The raw data should be collected from each of the respondents. The scores allocated to each question should be entered into a spreadsheet, for ease of data manipulation. The questions were categorized in the spreadsheet according to which of the five themes noted above they related.

Questionnaire Analysis

Analysis of the responses should be carried out by question and respondent. Each question should be analysed individually and each group of questions that relate to a theme should be analysed together.

Analysis by respondent, such as average response per theme and over the whole questionnaire is important. This analysis will indicate if there were any patterns in the responses from the different groups surveyed. For example differences of opinions between different user groups or project team and management could be indicated.

The type of statistical analysis applied to the results will depend on the number of respondents. Where the number of respondents is low (less than 30) then simple statistical analysis will be more appropriate such as mean and standard deviation from the mean. A typical result from this kind of analysis could be a mean response for a theme or question closer to five. The theme or question has a more favorable result which should indicate that it has been addressed more thoroughly and may require less additional attention. Where a larger sample size have been surveyed more sophisticated multivariate analysis can be used, such as factor analysis.

Where the number of respondents to the survey was small it was important that additional statistical measures are used to analyse the raw data. The variance of the response for each question could be calculated. A high variance score would indicate that there was little consistency in the responses offered. This could indicate either a badly worded question which should be edited or rewritten or a complete difference in opinion which may need investigating.

Once the questionnaire has been run and the responses collected and analysed, the results should be fed-back to the project team. The project team should further analyse the results. Where necessary actions to improve the situations where a question or theme scored a low average or a high variance in response should be created.

It is most likely that the questionnaire will have to be carried out on several occasions as the project progresses. The format of the questions may have to change depending on the stage of the project e.g. questions may have to be tailored to different respondents depending on who is involved in the project at the time, or if the questionnaire is run near the end of project, questions that refer to initial analysis of the problem situation may have to be removed or tailored. This will ensure that the framework is considered throughout the implementation of the project.

Questionnaire Validity

The questionnaire has been analysed for its internal validity. Internal validity checks that the responses given to the questions are consistent and that the questions asked cover the intended subject area thoroughly. A widely used statistical measure of the internal consistency of a multi-item scale is Cronbach's Alpha (DeVellis 1991).

Possible alpha scores are between 1 and 0. Higher scores indicate good quality of the questions. This means the questions are more likely to have covered the subject area in depth and responses to questions are consistent. Scores over 0.7 show good reliability and scores over 0.8 indicate very good reliability. The Implementation Audit Questionnaire alpha scores ranged from 0.74 to 0.85. The alpha score for the questionnaire would have to be recalculated if the proforma questionnaire was altered.

Current and Future Work

The researcher has been testing the framework and its tools since on a fourth project in IBM PSS. The project has been running since January 1998. The framework and tools have been modified considerably in this time. Feedback from users of the framework indicates that the application of the focus group and questionnaire has been very helpful. The project has been well planned and was thoroughly thought through in the beginning. Awareness has been raised and consideration has been made of all themes of the framework, throughout the project so far.

Appendix

For each item on the agenda a set of questions has been suggested. For example, focusing discussion around the problem and goal of the project is aimed at addressing the analysis of the problem situation. This will help to gather as much information about the problem situation and alternative methods of solving the problem as possible. The facilitators questions should include:

- What is the problem we are investigating?
- How should this problem be investigated?
- Who should do this investigation?
- What other projects will be affected by this project and which projects will have an effect on this problem?
- What methods of problem solving could be used for this project?
- What would be a good way to measure the success of this investigation?
- What should the goal of this project be?

A discussion about the scope of project helps examine what people, processes and systems are directly and indirectly effected and involved in the process change. This will help to define a boundary around the project for what is and what is not included.

The discussion about the people who are directly involved in the project is aimed at identifying employees who are likely to become a project team and how they will be involved in the project. By addressing who will be indirectly affected by the process change the topic of user involvement should be addressed further. Questions that the facilitator may ask, could include:

- Who should be directly involved in the project?
- Who will be affected by the project?
- How could we involve people directly?
- How could we involve people indirectly affected by the project?
- How could we measure the success of the direct involvement?
- How could we measure the success of the indirect involvement?
- Is there anything else in your experience that has worked well to get the people directly or indirectly involved?

The questions about senior management commitment are aimed at identifying exactly which senior managers commitment needs to be gained to ensure the project receives the relevant funding and resources it needs to be a success. It is also important to confirm who the sponsor of project is. The sponsors commitment to lead the project through to complete successful completion should be obtained. Relevant questions could be:

- Who should be the owner of the project?
- Who should be the sponsor of this project?
- Is there anybody else who needs to show commitment to this project?
- How do you think sponsorship should be demonstrated?
- How do you think ownership should be demonstrated?
- How do you think management commitment should be demonstrated?
- How can we measure the commitment/sponsorship/ownership?
- Is there anything else that has worked well in the past in sponsorship/management commitment/ownership?

Focus group questions about the processes should identify what the end to end process under investigation is and what activities it involves. It is also useful to understand what processes provide inputs and receive outputs from this process. Appropriate questions could be:

- What is the end to end process under investigation?
- What activities does the process involve?
- Who should be investigating/designing this process?
- How should we measure the process?
- Is there anything else that you have seen working in a process redesign project?

The systems discussion should focus on other IS and IT projects that will be involved in the change or affected by the change. These questions are concerned with understanding the problem situation as thoroughly as possible. Typical questions could be:

- What IT/IS are involved in this project?
- What systems are affected by this project?
- How are they going to be involved?
- Who should be responsible for their involvement?
- How are we going to measure the success of this involvement?

The project management system discussion directly addresses the issue of putting a formal project management system in place. Here the need for planning the project right through to completion should be stressed. Relevant questions could be:

- What would you like the PM system to include?
- What sort of timescales would you like to see for this project?
- Who would you like to be responsible for it?
- How should we measure the success of this system?
- Is there anything else from your experience that works well in a PM system?

Feedback should be asked from each attendee so that the focus group process can be improved. This can be asked for in the meeting, or a feedback request form could be distributed after the meeting via an email request. Typical feedback questions are:

- What worked well in the meeting?
- What did not work well in the meeting?
- What would you do differently with the meeting?
- What worked well with the meeting process that was followed?
- What did not work about the meeting process that was followed?
- What would you have done differently with the meeting process?

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**INTERNATIONAL SERVICE OPERATION MANGEMENT
ASSOCIATION CONFERENCE 1999**

MAULL R, NASH Z, CHILDE S. 1999. Improving Project Implementation at IBM. Presented at the International Service Operation Management Association (SOMA) Conference, August 22nd-25th.. Bentley College Waltham, MA, USA.

Improving Project Implementation at IBM

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Introduction

This paper presents the findings from a four year action research programme based within IBM UK's Product Support Services (PSS) division. IBM UK's PSS is itself a division of IBM Global Services. PSS are primarily responsible for the maintenance of IBM and some non-IBM hardware and software and the selling of services associated with them. This includes out-sourcing, on and off site maintenance, product sales etc. They employ approximately 1200 employees.

The action research programme set out to

1. identify the nature of the problems that IBM UK Product Support Services (PSS) were facing when implementing process based change projects
2. provide a means to remove and reduce the effects of these problems through an implementation framework.

The nature of the implementation problem was investigated through the direct involvement of the authors in three major change projects. The full results of these projects are discussed in Nash et al 1999. This paper sets out to discuss the implementation framework which was developed to overcome these problems.

A summary of the three initial process based change projects and how we identified a classification of the nature of the existing problem follows.

Project One

The first project sought to improve the efficiency of the whole area of product support (this included both on site and off site support for hardware, software and communications equipment). This project analysed the process in detail and indicated areas of activity duplication and more strategically areas where there was clearly gaps in provision which could mean that the customer faced multiple hand-offs without the problem being solved.

Project Two

The second project's objective was to develop a teamworking ethos across the whole organisation as a support for improved process working. Several senior PSS managers felt that teamworking was required to make the best use of IBM's skills and resource.

Project Three

The third project was a process re-engineering project called services development. The process to be re-engineered assessed IBM’s capability to offer hardware, software, networking and enterprise (large mainframe computers) servicing for non IBM products. The project was initiated as the process had become outdated, was focused on service cost planning instead of service development and there was no consistent process in place; each user completed the process according to personal working preferences and styles. The project vision was for the software, hardware, networks and enterprise processes to be combined into one generic process. A generic process had several benefits; for example

- better use of service development personnel, so that they could deal with a bid from any area in addition to their own specialism,
- creating an end-to-end process would lead to an increased understanding of the process, its resource requirements and the training and education needs.

In the view of IBM senior management all these three project failed. Each project was implemented to a different extent, but all were eventually abandoned. An abandoned project is one that ‘management decides, for whatever reasons, to discontinue temporarily or retire permanently’ (Ewusi-Mensah and Przasnyski, 1994). The intention of the research was to identify the reasons for failure.

Research Method

The authors set out on a systematic set of interviews of the senior management, project managers, team members and users to identify reasons for failure. We also ran focus groups from the wider organisation to identify reasons for project failure in projects *other* than these three projects. This was to overcome any specific problems associated with just these three projects and to generalise the findings across the whole of IBM’s PSS process projects.

The first phase of coding involved reading through every piece of relevant information generated in the research. Each paper-based transcript was read through and every unit of data assigned a code. Typically the unit of data coded was a paragraph and occasionally a sentence or phase. The code name that each unit of data had been associated with was marked in the margin of the transcript.

As the initial coding developed, general codes of similar subjects were grouped together. These groups became over-arching categories. The category or code being explained was highlighted in bold and italics, as illustrated below:

SMC	<i>“Top management commitment to the project being implemented is essential. Consistent active sponsorship, throughout the life of the project has been seen to be essential to keep motivation and morale to those involved in projects high. Commitment of the highest level of management and the management committee is more credible and preferable so that the change is completely and successfully implemented.”</i>
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APS	"One of the key problems to deal with is how to ensure that the project is in line with current organisations strategies and other changes taking place. A consideration with this problem area may be to assess whether the project is essential to the organisation."
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KEY: SMC = Senior Management Commitment, APS = Analysis of Problem Situation

Table 1: Development of Categories

The second phase of coding involved developing the detail of the categories. New coded data from the most recent interviews and focus groups was compared with the categories rather than other individual coded incidences. From this comparison sub categories developed; for example ‘sponsorship’ and ‘change agent’ became sub categories of senior management commitment.

The next stage of the coding was to decide which categories were useful. The focus was then on expanding or adapting useful categories, whilst abandoning less useful ones. Typically, categories where little data had been produced and/or the emerging category was unclear were abandoned; for example organisational culture.

After a number of iterations of the coding processes no new categories or codes emerged. Glaser and Strauss (1967) refer to this as data analysis saturation. When the current codes and categories “encompass all the nuances of any new data that are analysed”

Once the coding and categorisation was concluded, two interviewees and the second focus group reviewed the categories. Several categories were expanded and some described in more depth as a consequence of the feedback. These findings were then compared with the substantial implementation literature available. From these combined process of analysis five dominant themes of implementation failure emerged,

- senior management commitment,
- analysis of the problem situation,
- user involvement,
- project planning and management
- process focus.

These themes formed the foundation of the framework to help improve the management of process based change implementation. This framework was applied in a fourth project.

Fourth Project

A fourth process based change project was supported from January 1998 to January 1999. The intention was to test the framework that had been developed as a result of the three previous projects.

The project was focused on improving the process for managing the preparation and completion of bids. The bids in question were concerned with winning contracts to provide customers with IT support and maintenance. For each product the expected (planned) cost of providing maintenance is calculated. This cost is the key input used in calculating the total cost of providing maintenance quoted in a bid.

As the Bid project progressed the process owner realised there was no process in place to ensure that the most accurate and up to date product service costs were available. If this process is not put in place then products may not be priced accurately. The objective for the project was collectively agreed as:

'to provide the business with an accurate, constantly reviewed and up to date set of planned costs, so that profitable contract pricing is ensured into the future.'

Framework for Improved Implementation Process

The improved implementation process consists of using focus groups within IBM's formal project management methodology to develop a questionnaire.

Focus Groups

Each item on the focus group agenda was aimed at addressing a different theme or sub-theme of the framework. Each of the following groups of questions relate to one of the five themes.

Focusing discussion around the problem and goal of the project is aimed at addressing the analysis of the problem situation. This helps gather as much information about the problem situation and alternative methods of solving the problem as possible. The facilitators questions included:

What is the problem we are investigating? How should this problem be investigated? Who should do this investigation? What other projects will be affected by this project and which projects will have an effect on this problem? What methods of problem solving could be used for this project? What would be a good way to measure the success of this investigation? What should the goal of this project be?

A discussion about the scope of project helps examine what people, processes and systems are directly and indirectly effected and involved in the process change. This helps to define a boundary around the project.

The discussion about the people who are directly involved in the project is aimed at identifying employees who are likely to form the project team and how they will be

involved in the project. By addressing who will be indirectly affected by the process change the topic of user involvement should be addressed further.

Questions that the facilitator may ask, include:

Who should be directly involved in the project? Who will be affected by the project? How could we involve people directly? How could we involve people indirectly affected by the project? How could we measure the success of the direct involvement? How could we measure the success of the indirect involvement? Is there anything else in your experience that has worked well to get the people directly or indirectly involved?

The questions about senior management commitment are aimed at identifying exactly which senior managers commitment needs to be gained to ensure the project receives the relevant funding and resources it needs to be a success. It is also important to confirm who the sponsor of project is. The sponsors commitment to lead the project through to complete successful completion should be obtained.

Relevant questions include:

Who should be the owner of the project? Who should be the sponsor of this project? Is there anybody else who needs to show commitment to this project? How do you think sponsorship should be demonstrated? How do you think ownership should be demonstrated? How do you think management commitment should be demonstrated? How can we measure the commitment, sponsorship and ownership?

Focus group questions about the processes should identify what the end to end process under investigation is and what activities it involves. It is also useful to understand what processes provide inputs and receive outputs from this process.

Appropriate questions include:

What is the end to end process under investigation? What activities does the process involve? Who should be investigating/designing this process? How should we measure the process?

The systems discussion should focus on other IS and IT projects that will be involved in the change or affected by the change. These questions are concerned with understanding the problem situation as thoroughly as possible.

Typical questions include:

What IT/IS are involved in this project? What systems are affected by this project? How are they going to be involved? Who should be responsible for their involvement?
How are we going to measure the success of this involvement?

The project management system discussion directly addresses the issue of putting a formal project management system in place. Here the need for planning the project right through to completion should be stressed. Relevant questions include:

What would you like the project management system to include? What sort of timescales would you like to see for this project? Who would you like to be responsible for it? How should we measure the success of this system?

Questionnaire

The purpose of the questionnaire is to take the answers to the questions above and use these as a basis for auditing each of the five themes of the framework. These would help to identify areas in a project that may need some additional work or attention. Where the analysis of the questionnaire shows there may be some inadequately developed areas, then these areas can be improved by a focused intervention from the project team. A specimen copy of the questionnaire can be obtained from the authors.

Originally 141 questions about different aspects of implementation were collected and generated. The questions were distributed amongst the themes depending on the number of issues raised during the focus group. For example twelve statements were developed for the Senior Management Commitment theme, where as 21 statements were developed for the process focus theme. The final questionnaire was pre-tested by two process improvement specialists. This process of reviewing and refining reduced the number of questions down to 77.

A Likert five point scale where one indicates a strong disagreement to the question and five indicates a strong agreement with the question was used. The issues of validity and reliability of the questionnaire were addressed and are described in Nash (1999xxx)

Results

The questionnaire was used twice within the life of the project. At the beginning to identify potential problem areas and after six months to assess whether those problem areas had been addressed.

For each of the five main themes the results were as follows.

Senior Management Commitment

This theme had the highest overall average score in both the first and second questionnaires. The theme mean increased from 3.67 to 3.97. This is statistically significant (see the t-test discussion below). The main items items that scored well above the mean were concerned with whether the sponsor *'...demonstrated commitment to making the process change happen'*, if *'The sponsor was effectively leading the process change'*, *'... believes there is a real need for the change'* and whether *'The sponsor understands the process change'*. As with the first questionnaire the lowest scoring items were concerned with how well the change agent is leading the change. *'A change agent (e.g. project manager, facilitator, team leader) is leading the change'* had the largest standard deviation of 1.00.

Only two items produced a lower mean score in the second questionnaire. These items were The sponsor *'understands the process change'* and *'believes there is a real need for the change'*.

Actions

The improvement in the theme mean was linked to an increased level of senior management commitment. Since the first questionnaire had been administered the project had been included in the management team project portfolio and the management had ensured the provision of information systems developers time to the project. The management commitment was also evidenced when commitment was maintained through several management structure changes.

The low means associated with change agents was probably caused by the role of the agent being more of a facilitator than a leader or catalyst of change. In any case, the sponsor of the project was extremely closely involved in the project, so no additional leadership from a change agent was thought to be needed.

User Involvement

User involvement had the lowest theme mean. The average response for the theme has increased from 3.15 in questionnaire 1 to 3.53 in questionnaire 2. The t-test confirmed that the improvement is statistically significant. Seven items concern user involvement, seven are concerned with communications and three are teamworking items.

The responses to 6 out of 7 of the user involvement items had improved. The average response to the item *'Some people were not convinced that this process change was necessary'* remained unchanged and well below average. This item also had the highest standard deviation (1.19). The items *'The financial resources needed to implement this process change are available'* and if *'The impact of this process change on the end users daily work patterns have been adequately considered'* were also below average. The items with higher than average results were about if *'Project members feel ownership of the process change'* and whether *'Input has been solicited from the end users through-out this project'*.

The response to the communication items improved considerably. The items which had a higher than average score were concerned with internal communications within the project team; such as *'Communications to all those immediately affected by the process change have been planned'* and *'Communication between those directly involved in the project is effective'*. The lower scoring items were concerned with the quality of communicated externally to PSS; whether *'Insufficient information about this project is being communicated in PSS'* (this item also had the highest standard deviation of the theme at 1.08) and if this information *'gives a clear and consistent message'*.

Two teamworking items had higher means than the overall average, *'The project lends itself to an individual effort rather than a team-based approach'* and *'Project work group members understand their roles in the process change project'*. The

item which fell below the mean (*'Those working on the project work as a team'*) also had the highest standard deviation of 1.08.

Actions

The team felt that there were several reasons for the improvement in user involvement. The new process and supporting information systems had been demonstrated to the department and systems education and training had begun. In addition, the product planners were following the new process. The team were unsure why there should be a such a variance in opinion about whether people were convinced the process change was necessary.

The average response to the communication items had improved. Several additional means of communications had been employed since the first questionnaire; an article had been published in the PSS magazine and several presentations to the management board and the product planners had taken place.

The perception of teamworking had not improved greatly. One possible reason for this was the extended team contributed very little to the project and the core team felt this lack of contribution. The differing of opinions between the core and extended team may have caused the high standard deviation in the item *'Those working on the project work as a team'*. The relationship between the core and extended team needed to be very carefully managed. As a result of this analysis the project team felt that communication to the wider team was not as thorough as it could be. It was identified that there had not been much traditional teamworking, such as off-site team days to develop the new process. It was felt that teamworking should be improved within the project team. An action to address this as a result of the lack of improvement in the second questionnaire was taken.

Analysis of the Problem Situation

The overall mean of the theme increased from 3.23 to 3.7. As with the other themes the t-test confirms the improvement in this theme is statistically significant. This theme has the second lowest scoring theme mean. Items above the mean were *'Different and alternative perspectives of the problem have been considered'*, *'Alternative approaches to solving the problem have been considered'* and *'The real problem is being addressed, and not just a symptom of a more complex problem'*. Other high scoring items were about where the project fits into other changes. *'It is not clear where this project fits into other projects occurring in PSS'* also had a higher than average score, also having the highest standard deviation of 1.23. The lower scoring question were concerned with whether those *'directly'* and *'indirectly affected by the project had been identified'* and *'The affect this process change will have on other projects has been considered'*.

Actions

The team thought the improvement in the original scores for this theme may have been caused by an increase in understanding about the initial problem investigation. The implementation focus group was the first meeting held about this problem. Much problem investigation and exploration occurred in this meeting. However, it was felt there was a lack of communication about the focus group outputs. It was

not until the project progressed that people began to understand the type of problem analysis and investigation that had been done.

Process Focus

This theme had the second highest theme mean. The theme mean had increased significantly from 3.36 to 3.7. Items that scored above the theme mean concerned *whether the process change was really needed, whether the process owner had been identified, education and training would be provided, would the process be used and had the process measures been identified*. Items below the mean included; *the process change is compatible with existing processes and other planned process changes, inputs, outputs and process boundaries have been identified and the IT and IS support will be provided*. Two items 'The process owner has end-to-end responsibility for the new process' and 'There is no provision for the IT and IS requirements that will be needed to support the process change' had larger standard deviations; 1.16 and 1.15 respectively.

Actions

The process items with the lower than average scores dealt with detailed aspects about the process. It is a natural reaction for those who do not know the process in detail to tend towards a more neutral response. On the other hand, items with the higher means are those that are more generally understood; such as the provision of education and training.

The improvement between the two questionnaires may be linked with the improvement in results from the product planners who had begun to use the process. This meant their understanding of the process had improved as the project progressed which helped the scores to improve.

Other action that were taken included an action to identify the processes that provide inputs or receive outputs from the review process. It was also agreed to clarify the ownership of the "end to end" process at the next team meeting.

Project Planning and Management

The overall mean for this theme, increased from 3.34 to 3.73. This is the third highest scoring theme. Items above the theme mean are concerned with whether 'The project has been planned through to completion', 'The project timescales are realistic' and 'The project plan is not achievable e.g. insufficient human resource, IT, finance etc. Other items that have average scores above the theme mean are concerned with the project management documentation, the project managers and project teams effectiveness. The lower scoring items are about writing a business case, assessing the risks and dependencies of the project. For the item 'Project work group members are unreliable about carrying out duties and responsibilities assigned to them', scores have worsened since the first questionnaire. The item 'The original aims and objectives of the project are not reviewed and revised periodically' had the highest standard deviation of 1.31.

Actions

As the project progressed the respondents gained more experience of the project management. The project was planned and monitored throughout. This may have helped in improving the average scores. The team felt that the scores could have been improved with closer management, e.g. reminders of actions to be taken. Results indicated that the aims and objectives of the project were still not being reviewed regularly. This was taken as action to be addressed.

Overall Project Satisfaction

The theme average had increased from 3.58 to 3.93. Satisfaction with the project had increased but belief that the project would achieve what it set out to showed little improvement.

Actions

The further increase in the satisfaction with the project was very encouraging. Ginzberg (1979) states that this is a good measure of implementation success. This was probably as a result of the measures taken to improve the project which have been outlined above.

T-test Analysis

A paired two tailed t-test was performed for the questionnaires. A paired test examines the probability that the changes in each individual's scores could have happened by chance. It is more powerful than a non-paired test since the results for each individual before and after are compared rather than the sample mean as a whole. The paired test is appropriate as two sets of results that have come from the same sample are being compared.

Theme	Probability
Senior Management Commitment	6.4e-05
Process Based Change	3.7e-06
Analysis of Problem Situation	3e-05
User Involvement	2.2e-07
Project Management	4.4e-06

The null hypothesis (H_0) is that the results from the first and second questionnaire are statistically the same. For each theme the probability of the results being statistically the same is much less than 1%. The null hypothesis is rejected.

Conclusions

The data generated from the first three projects indicated that many factors affected implementation. It was not possible to attribute unsuccessful implementation to one factor or say that one factor was more inhibiting than another. It was not that one project was more organisationally complex than another or one project was larger than another or that it affected or involved more users than another that was leading to implementation failure. No matter what

factors were encouraging or inhibiting implementation or what characteristics a project possessed, projects were failing in implementation.

The implementation framework was tested on a fourth action research project in the product planning area of PSS. The project ran from January 1998 to January 1999. In contrast to the original three action research projects, this process-based change project was successfully implemented. The project was completed on time and to budget; the process and supporting information systems were completely implemented and the process was producing the benefits it set out to achieve. For example the change in process lead to a complete change in working practices and in the role of the product planner. The role became less reactive and more proactive, with more time spent planning product costs and analysing product performance and less time responding to queries. Several process improvements were gained as a consequence of the implementation. The product review cycle time was reduced from one week to two days. Product reviewing was also possible two weeks earlier than previously.

Applying the framework ensured that the five themes were monitored and considered throughout the project. The results from the questionnaires indicate that the actions taken as a result of the first questionnaire had improved the positive perceptions of the team members in the six months between administering the first and second questionnaire. The t-test indicated that this improvement was a statistically significant increase.

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**INTERNATIONAL JOURNAL OF TECHNOLOGY MANAGEMENT
2000**

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Factors affecting the implementation of process based change

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Abstract

Failure is more common than success in the implementation of process based change. This paper looks at some reasons for failure drawn from implementation projects at IBM Product Support Services UK. PSS is primarily responsible for the maintenance of hardware and software and the selling of services associated with them. The research project focuses on process changes currently taking place within the division. The researchers were able to participate in process change projects and were able to use an approach based on action research.

Three case studies of process based change were carried out. The first case study investigated the processes in the IBM Customer Support Centres. The second case study was a project to redesign service development processes. The third case study was about implementing a teamworking culture across PSS. In each of the three projects, there was a substantial analysis phase followed by disappointing results.

One important factor was found to be organisational culture. The culture was often described as very 'solutioning' based, where little time is spent on taking a 'holistic' view or thoroughly examining the problem. The culture has also been described as 'macho' where fixing a problem as quickly as possible is given the most credibility.

Other factors which inhibited implementation included failures in project planning and management. There are also failures in process analysis, where departmental and functional boundaries restrict the work. There were several findings concerned with various human factors, such as failure to support user participation, teamworking and a lack of senior management commitment.

Six problem themes arise. These are project planning and management, organisational culture, senior management commitment, analysis of problem situation, user involvement and human factors. The research project is currently testing these six elements in a framework to improve the implementation of process based change.

This paper results from work done on a collaborative research project involving IBM Product Support and Services (PSS) and the University of Plymouth between September 1995 and January 1998.

Keywords

Implementation, Process Based Change, Organisational Culture, User Involvement. PSS Product Support Services UK (IBM).

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Biographical Notes

Zoe Nash is a change management specialist, completing a PhD in improving the implementation of process change. Zoe's PhD is a joint collaboration project between the University of Plymouth and IBM UK.

Zoe has several years practical experience of organisational change activities from her work in a Business Transformation team at IBM UK. From her joint role as academic researcher and IBM employee, she has used the results of her IBM work as empirical evidence for her PhD. From these results she has developed a framework to improve the implementation of change, which has been applied in IBM. Zoe's research interests include implementation, organisational culture, BPR and human factors approaches to change.

Background

The principal author works full time in IBM, Product Support and Services (PSS) engaged on a daily basis in business process improvement activities. The PSS division is primarily responsible for the maintenance of hardware and systems software and the selling of services associated with them. PSS provides customers with services such as design, implementation, planning, operational and systems management for information systems of all kinds. These services are provided for both IBM and non-IBM products.

The process changes occurring in PSS are based around the deployment of a common set of processes that are being used in all IBM's marketing and services companies. The process change project is called Customer Relationship Management (CRM). The goals of CRM are to increase customer satisfaction, increase market share, reduce expenses and increase employee morale.

The Problem

The purpose of the original research project was to further understand what happens in an organisation, in this case IBM, when implementing process based change.

In IBM, the development of processes is often known as Business Process Re-engineering (BPR). Hammer, who wrote the seminal article on BPR defines re-engineering as, 'the fundamental rethinking of business processes to achieve dramatic improvement in critical, contemporary measures of performance, such as cost, quality, service and speed.' [xvii] Since 1990 when BPR first began to emerge there has been an enormous amount of literature generated on the subject. Some of the literature is concerned with reports of unsuccessful implementation, for example Hammer estimated that 'between 50 and 70 percent of re-engineering efforts were not successful in achieving the desired breakthrough performance.' [xviii]

Meredith[xix] and other authors[xx][xxi][xxii] have discussed the problems surrounding implementation. Meredith noted in 1981 that the field of computer systems implementation had been receiving attention for the previous 20 years, mainly due to the vast amount of implementation project failures. Seventeen years on from Meredith's article there is still much literature reporting on implementation issues. Sabherwal and Robey also state that knowledge about implementation is 'analogous to cooking with a list of ingredients but without the recipe. We need more research on how the ingredients are combined before a recipe for successful implementation can be prescribed'. [xxiii]

Implementation

Implementation is a complex concept that is found in many different disciplines, such as management science, manufacturing operations, social science and information technology.

When considering implementation it is useful to consider different authors' views and definitions of implementation. Much of the traditional implementation literature discusses technical implementation of computer systems where implementation is traditionally described as being one of the final stages in the systems life cycle. The systems life cycle (SLC) or systems development life cycle (SDLC) is a model used to identify stages in the development of a system, typically a computer system.

Ginzberg describes the traditional view of implementation as 'that part of the development cycle beginning after the system or model has been designed and built, and ending as soon as outputs are produced'[1]. Activities which are typically included are systems programming and testing, user training and the physical change from the old to the new system.

Lucas puts forward an alternative approach to implementation as one of the final stages of systems development. This alternative approach considers implementation as being part of all stages of the systems life cycle. This view describes implementation as 'an on-going process which includes the entire development of the system from the original suggestion

through the feasibility study, systems analysis and design, programming, training, conversion, and installation of the system'[IX].

This view can be described as the 'wider view' of implementation. This view of implementation is held by authors such as Lucas[xxiv], Ginzberg[I] and Meredith[II]. It is this wider view of implementation which will be used for the purpose of the research. An appropriate definition of this view of implementation is put forward by Ginzberg: 'beginning with the first thought of developing a system, and not ending until the user either is satisfied that he is in control of the system or has abandoned the project.' [xxv]

Research Method

A hermeneutic epistemology has been followed during this research. Burrell and Morgan define hermeneutics as 'interpreting and understanding the products of the human mind which characterise the social and cultural world'[xxvi]. Hermeneutics is an objective based philosophy. The ontology of hermeneutics is based on realism, where the world is made up of human constructs. In hermeneutics it is believed that humans 'externalise the internal process of their minds' by creating 'cultural artefacts'[XXVI].

A research method which is closely related to hermeneutics is action research. Gummesson describes action research as 'the most demanding and far-reaching data generating method in case-study research'[xxvii]. It involves the researcher forming a relationship with an organisation. Once the researcher is placed in the host organisation there must be 'the expressed intention of both parties to be involved in change'[xxviii]. Rapaport provides a slightly different focus, 'Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.'[xxix]

These requirements are met in this research by the researcher becoming a full-time member of the staff of the company, and taking a full part in the projects being investigated. This has resulted in the company and the university both owning the researcher. Thus the collaboration is ensured by the continuing presence of a university researcher as a pseudo-employee in the company.

The validity of the action research must be ensured as much as possible. Eden and Huxham have compiled a list of twelve contentions that must be fulfilled if the research is to be viewed as 'quality research'[xxx]. The research will be tested against each contention to ensure the continuing sound basis for the program.

Case Studies

In order to cover a significant cross section of the process based changes three projects have been identified for analysis.

- A problem identification and problem resolution project in the IBM Central Support Services (CSS). This case study has been chosen as a typical case study and is described in detail below.
- The second case study was a process redesign project in the services development area. The project was focused on a solutions design and delivery sub processes, called services development. A steering committee was formed to lead the project. The steering committee consisted of representatives for each the sub groups that are involved in the process and two facilitators. The researcher was one of the facilitators.
- The third case study was a project to implement a teamworking culture across PSS. The aim of the project was to create a high performance work culture which could then be implemented across other parts of the organisation. The project ran from February 1996 until July 1997. A project manager was assigned to run the project. The researcher was assistant to the project manager, and was a member of the teamworking project team.

Central Support Services (CSS) Case Study

Research was carried out in this area from January to December 1996. The support centres are groups that assist customers when their computer systems, usually mainframe computers, fail. Customers who purchase the breakdown and recovery maintenance services from IBM are entitled to call the support centre for assistance with queries and technical problems. When the customer reports a system failure the problems are either fixed remotely by people in the IBM support centres, or where necessary a customer engineer is sent to the customer site to manually "fix" the computer system.

The support groups are divided into different areas depending on the type of technology that is specialised in. The areas which were investigated include, enterprise software support, enterprise hardware support, enterprise assist, network support group and AS400 computers. "Enterprise" refers to complete support for a business, such as support for all the computer equipment used by a chain of supermarkets in the UK.

Project Objective

The purpose of starting this project was to collect information about processes that were in operation in the IBM customer support centres. It was initiated by the Solutions Delivery process owner so that a business decision about whether the processes should be re-engineered or incrementally improved could be made.

The sponsor gave the project senior manager level support and commitment and acted as project representative at relevant senior management team meetings. The Solutions Delivery process owner was an appropriate sponsor as the CSS processes being investigated were sub processes of the Service Delivery process.

During 1995 it had become increasingly apparent to managers in the support centres that their processes are quite badly 'broken'. In addition to the 'broken' processes there were several other serious issues which were of concern, these included:

- There were an increasing number of horror stories and rumours being generated about the quality of the service received from the support centres, particularly about ineffectiveness and delays. There were very few facts to support these stories.
- There was also increasing pressure from customers who did not believe that IBM supported them well enough.
- There was a serious lack of knowledge about how the support centres operate. For example, little was known about the size of the support business, whether the business was increasing or decreasing, or the productivity of support i.e. the number of problems handled per person per day.
- CSS is divided by technical specialisation. There was a problem of little communication between technical groups.
- It was perceived that customers now wanted a fully integrated support service which could support all their hardware, software and networking needs in one service. IBM could not provide this type of service at the time.
- CSS had evolved in an unplanned fashion. It was therefore perceived that the CSS may not be organised in the most appropriate way.

Method of Project Initiation

An initial meeting was held with the project sponsor and the researchers. During the initial meeting the following areas were addressed:

- What is the scope of the project?
- What are the major issues and concerns perceived to be in CSS?
- What is the present and what was the past structure of CSS?
- What changes have taken place in CSS over the previous years?

This case study was not organised as a formal project. The goals, objectives and boundaries were not formerly defined and the project was not run by a project manager or completed by a project team. As a result of the informal nature of the project the researcher requested that the project's objectives and boundaries were reclarified with the sponsor a couple of months into the project; It was noted that the 'project scope grows larger every time we dig a bit'[xxxi].

The project was given high level management support and commitment. This meant that access to the appropriate managers was gained relatively easily. Access to relevant information such as process measurements and other statistics was also gained easily.

Method of Problem Investigation

The main method of research was via interviews. The general pattern that these interviews took was firstly to interview the managers of each area and then to interview specialists (who would be identified by the manager) in each area,. Six management interviews and fourteen IT support centre specialist interviews were conducted. Many follow up discussions also occurred as a result of these interviews.

The interviews averaged two hours and they were usually informal discussions at the interviewee's workplace. These interviews and discussions took place over a period of three months.

The type of information that was gathered in the managers meeting included an explanation of the structure of their area, discussion about recent changes, current problems, and performance against key measurements. Descriptions of the key processes were also taken. The interviews with specialists focused on the detail of how the key processes actually worked.

In each area two or three specialists were interviewed so that a view of the key processes could be built up. The type of questions which were asked included:

- What steps are involved in the process?
- Who is responsible for which activities?
- What handovers are there in the process?
- What process measurements are there?

The interviewees were all extremely helpful and willing to describe what was going on in their areas. There was only one interview with a manager where we found a considerable amount of resentment about the work we were conducting in his area. This resentment was due to the manager's perception that in looking at the improvement of processes we were duplicating ongoing work that he had assigned to people in his area. Over time as the researcher's credibility grew and the project became more widely known about and important, the resentment decreased.

The Problem Handling Process

From the interviews and discussions a series of IDEF0 diagrams illustrating each of the key support centre processes were developed. IDEF0 is an activity based process modelling methodology. IDEF0 represents processes as a series of activities which are linked by information and data flows. Each model drawn depicts the means by which each activity performs its function, what inputs are required, what outputs are produced and what process controls and constraints are in place. Processes are represented by a hierarchy of process diagrams. The process models are broken down into increasing detail as each activity of the high level models are decomposed into their individual activity flows. In total 19 IDEF0 models, decomposed through four levels were developed to represent the processes in CSS.

Figure 1: IDEF0 Diagram of the Call Handling Process illustrates a typical example of the process diagrams that were developed. Each of the process diagrams was discussed with the relevant support centre specialists, manager and the sponsor throughout development. The diagrams were revised accordingly until all parties involved were happy that the IDEF0 models were a fair and accurate representation of the process in use.

Figure 1 illustrates the high level process which is followed to deal with a customer's call. The process is triggered when a customer first places a call to the NCMC to report that one of their computer systems has failed. The NCMC staff take the customer's name and brief details about the problem. The NCMC collect information on the severity level of the problem and whether the customer is entitled to the service they are requesting. NCMC staff determine the problem type and these details are then entered on a database called Retain. The problem is entered on Retain as a PMR (Problem Management Record). Retain routes the problem to the relevant queue in the relevant support area. Each support area has a different process for problem handling.

Results from the Process Investigation

There were several immediate problems that became apparent from the process investigations and mapping.

- It was very difficult to define an end to end process from customer call to problem resolution as there was much functional specialisation. As a result of this functionalisation there was no ownership of the whole processes, many managers owned different parts of the process.
- There were a series of high level ambiguous hand-offs which required clarifying. In some cases when a problem was passed to different functions it was not clear to whom or to where the problem should go.
- Several groups dealt with networking problems which caused confusion.
- There was some confusion over who should deal with certain types of software calls.

These results were detailed in a report which was submitted to the management committee (July 1996). The report detailed results of the interviews, key issues from the process diagrams and made recommendations in the six areas of strategy, human factors, information technology, performance measures, scope of change and process architecture.

It was recommended that some short term incremental improvements be taken immediately and that long term radical improvements be worked on in the future. The short term recommendations included beginning work on the processes in the hardware support centre, so that a more robust process could be put in place. Other recommendations included introducing a standard set of process measurements across CSS. Long term recommendations included developing a five year strategic plan for CSS, including identifying core competencies which could be benchmarked against best practice.

A few weeks prior to the submission of the report, a new manager was put in charge of the CSS. The report was presented to the new manager in a two hour meeting. The work was accepted as being very useful, particularly as it had been carried out by a research team which was seen as independent of IBM. However the results of the work were not received

with enthusiasm. The new manager was not familiar with the work that the researcher had carried out, so the results were not perceived to have much credibility.

Further Project Work - Hardware Support Centre (HSC) Sub Project

As a result of submitting the management report it was decided that resources should be focused in one area. This was the Hardware Support Centre (HSC). The researcher continued work on this project. The researcher's roles included participant, observer and facilitator to meetings and workshops.

The first step in kicking off this sub project was to hold a project definition workshop to define the goal, objectives and scope of the project. The manager of the area and two specialists were present at the meeting, which the researcher facilitated.

It was decided that overall the aim of the project would be to improve morale, whilst taking account of advancements and constraints of relevant systems and technology. The scope of the process was to include every activity from receiving a customer call or machine call right through to problem fix.

Project Progress

As noted above the Call and Problem Handling project was completed and the recommendations report presented in July 1996. The HSC project was initiated as a consequence of these recommendations.

In November 1996 an organisational structure and management structure reorganisation in PSS began. A new director was assigned. Many projects occurring in PSS were put on hold whilst a review of the business was completed. The HSC project was amongst the projects put on hold. This project stalled after the initial kick-off meeting.

Project Closure

The management structure and strategy changes meant that the initial sponsoring manager moved to another part of IBM. This led to the project losing its visibility and emphasis. The new Solution Delivery manager took ownership of the HSC project, but not sponsorship. This manager recognised that it was unclear where the HSC project fitted into other projects that were taking place and other process changes that were occurring in PSS. The manager was also aware that how the project fitted into the new business strategy for PSS had not been considered. This manager also noticed that the project had not been set up as an official project. There was no project management system in place, no project team had been formed, no project plan had been developed and no business case had been created.

The lack of formal project organisation meant that the manager could easily put the project on hold until the new strategy for PSS has been confirmed. The HSC project was eventually completely discontinued at the beginning of 1997. This project was superseded by other projects that were perceived to be more in line with the new management strategy for PSS. The project did not progress any further than its initial meeting.

Very little occurred as a consequence of the recommendations put forward in the management report. Several people who knew about the existence of the process diagrams and the report asked to see the documents or used them for input to their projects, but essentially the project has been archived. Indeed, the sponsor was noted as saying that 'after the results were submitted very few, if any of the findings were acted upon'[xxxi]. The other two cases had similarly disappointing outcomes.

Findings from Case Studies

From the case studies and other general process change work the researcher was involved in, common issues affecting the success of implementation began to emerge. From this empirical evidence, six dominant recurring themes affecting implementation were drawn out.

The dominant themes that developed were also supported in the implementation literature as influencing implementation. These themes were tested and discussed using focus groups and interviews within PSS.

- Two half day focus groups were held to discuss the attributes of successful and unsuccessful projects. The purpose of these discussions were to broaden the understanding of the problems faced in PSS when implementing process based change.
- General interviews were held with employees who were heavily involved in the process improvements in PSS. The findings and problem areas were discussed.
- Interviews were held with the sponsors of each case study. The findings were discussed, developed and enhanced.

Problem Areas

The six themes that became apparent were, user involvement, organisational culture, project planning and management, process based change, senior management commitment and analysis of the problem situation.

- The user involvement theme is predominantly concerned with how employees, directly and indirectly affected by change are included in the project. Other aspects which the case studies showed to be important were, teamworking, training and education.
- Culture themes include the perspective and perceptions about the way the part of the organisation under study works and specific characteristics and habits.
- The project planning and management theme is concerned with the project management methodologies, tools and techniques which can be employed for a project.
- Process based change is looking at the current and future process changes that are occurring and whether true process change is occurring; for example, are functional boundaries being crossed?
- Senior management commitment is about ensuring that the relevant high level management are committed to the project and are willing to demonstrate their commitment by active involvement. This theme is also concerned with assigning a committed and active sponsor.
- Analysis of problem situation is about taking time to investigate the problem or project at the outset of the project. This includes looking at the project within the context of other changes which are occurring. This may include investigating which other projects will be affected and ensuring that other projects that will affect the problem are considered.

The case studies provided a wealth of findings. Typical findings from the case studies and supporting literature for the most relevant themes for this paper, user involvement and organisational culture are presented below. Typical findings from project planning and management, process based change, senior management commitment and analysis of problem situation themes are also described.

User involvement

Human factors in general have been described as 'the involvement of employees in the change programme and the implications of their involvement for the redesigned business processes'[xxxii]. Ives and Olson describe user involvement as 'participation in the development process by a member or members of the target user group'[xxxiii]. Authors such as Mumford[xxxiv] and Robey and Farrow[xxxv] believe that employee involvement in systems design is a key factor in successful implementation. There are however, conflicting views such as those of Hirschheim[xxxvi] and Ives and Olson[xxxvii] who argue that there is little empirical evidence to prove that employee participation in systems development has any significant positive effect on the success of implementation.

Much of the recent implementation literature with a "human factors" bias is less centred on user participation. Recent literature appears to focus more on how to change employees' attitudes and behaviours, education and training and how to deal with role changes leading to more successful project implementation. It is recognised that aspects such as education and training are required for implementation success, for example Kinnie and Staughton state that 'ensuring that the skills knowledge and attitudes the company need now and the different ones they may need in the future are recognised and developed'[xxxviii].

The empirical evidence collected so far indicates that the human factor could be one of the essential components in ensuring the success of implementation. For example, each of the projects has benefited from elements of teamworking. Two of the case studies had steering committees. These teams were very productive and worked together well. In each of the case studies the process changes were complex, involving several departments, different processes and different information systems. Teamworking was perceived as a very useful method of working in this type of situation.

The case study described above was run by a steering committee that had representatives from each group of users affected by the proposed changes. The teams worked well. Working in teams also meant that different perspectives, problems and alternative options were considered.

Even though different areas of the business were represented in the steering committees, it was noted that user involvement in the changes could be encouraged to a greater extent. If more users were involved it was felt that there would be more commitment to the changes that were taking place.

In all of the case studies the internal communication between those directly involved in the projects was usually very thorough. However, external communication to those who were affected by the project but not directly involved in the project team was not always consistent or regular. Where communication was not sufficient, employees were not always committed to the project and could be resistant to the changes.

Organisational Culture

Schein defines culture as 'the pattern of basic assumptions that a given group has invented, discovered or developed in learning to cope with its problems of external adaptation and internal integration and that have worked well enough to be considered valid'[xxxix]. Organisational culture is however, a relatively new area of investigation in implementation. In his discussions on the effect of culture on IT implementations, Cooper points out that the 'impact of culture has largely been ignored by IT implementation researchers'[xli].

Organisational culture is viewed by some authors as an important issue that may affect the success or failure of implementation. For example, Revenaugh, in his examination of the level of effort required to implement a process change states that 'corporate culture is a key variable in implementing any major business change'[xlii] and Capaldo et al state that 'implementation is as much an organisation change as a technology change'[xliii].

The cultural aspects of the case studies that have been noticed include aspects such as the common description of PSS as 'full of solutioning'. The PSS division has its foundations in the customer engineering environment, which has led to behaviour described as 'Mr Fix-it' or 'solution driven'. This means that when a problem occurs the normal behaviour is to search for a solution immediately. In each of the case studies there was little time spent on examining the nature of the fundamental problem. In addition little time was spent on assessing whether the initiated project would be affected by, or would affect, other changes in PSS. This type of behaviour was described as 'in the bath thinking', where ideas occur, but 'time is not spent thinking up alternatives'.

Respondents suggested that a common occurrence in IBM is 'too much change IBM do not give changes a chance to produce the benefits they were intended to generate before the next change is being introduced.' Each of the case studies suffered repercussions from the restructuring of the organisation. In two of the case studies the projects were put on hold whilst a new management structure was put in place and process change projects

were reprioritised. In both of these cases the projects were eventually superseded by projects which were given a higher priority in the reorganisation. The third case study also suffered some effects of the organisational restructuring. The constant change environment also meant that when a new concept for change was introduced or a new project began, it was viewed with scepticism, as the latest 'fad'. There appeared to be a perception that if the new concept was ignored, it would eventually disappear and work could be done in the way it always had been. This perception made it very difficult to generate commitment to the project.

Another common behaviour in PSS is to concentrate on tactical (short run) work and to do less strategic long term work. For example, there is a tendency to focus on reducing costs in the next quarter as opposed to investigating what products the market will be demanding in three years time. It was alleged that 'PSS does not plan properly in the long run'. With few strategic plans it is 'difficult for managers who have ideas to check they match future strategies'. 'PSS tends not to take a broad view of a problem.'

Two case studies found cultural conflicts within the workforce when process changes had been introduced. The employees were resistant and resentful of the changes that were introduced as it meant introducing a new way of working. In some cases, where role changes have been introduced people have resisted the change and have continued to work the old way.

The other factors will be described briefly:

Project Planning and Management

Two of the case studies did not have a formal, agreed project planning and management system in place. These two projects were not run by a project manager and were not formally organised as projects. The lack of formal project management meant that there was no discipline to develop a business case in support of the project. It was noted that not having a formal business case meant that when organisational changes were introduced there was no agreed business reason for the existence of the project. This meant it was easy for the project to be suspended. The projects' goals, objectives and boundaries were not formally agreed, which may partly explain why the projects suffered from missed deadlines, carried forward actions and slipping timescales.

Process Based Change

In the above case study there was little co-ordination of process change projects. There was often little knowledge about other process changes that were occurring in PSS. Very little was known about similar projects that may be taking place in other areas of the company.

In each of the case studies it was claimed that process re-engineering was taking place. It became evident that the projects were what would be regarded as either process mapping or process analysis. In particular there were many process analysis activities and few successfully implemented process changes.

The case studies took a departmental view of process activities. The boundaries which defined the processes only included the activities which took place within the department. Interfaces with other departments, the sources of initial inputs to the processes or the receivers of the eventual outputs were not usually considered.

In many cases there was no common way of working. More often, there were several variations of how to deal with similar work. Often the processes had not been documented. Usually, the particular sequence followed was only held in the head of the individual employee who carried out the process.

There were few process performance measurements available. Measurements were generally concerned with topics such as customer satisfaction rather than process performance. One interviewee noted that he was 'struck by the lack of interesting, useful data that people have to hand', for example, it was very unusual for people to be aware of how long it took to complete different procedures. There were also no consistent measures across the different functions. It was usual for different measurements relating to the same

project to be presented in various formats, such as bar graphs, line graphs, tables of figures. As there were inconsistencies in the process architecture, finding measurements that matched up across the whole process was difficult, and usually the measurement of a process from end to end was not possible. Where processes were being measured, it was sometimes the case that the most appropriate processes, tasks or activities were not being measured. An example from the above case study was that in the call centres, where customer calls about their computer failures are received, personnel are measured on their response time and the time taken to deal with each call. This led to rushing calls through quickly and sometimes routing calls through to the wrong place, just to save time.

Senior Management Commitment

Each of the case studies was affected by sponsorship problems. Two of the case studies began with strong active management sponsorship which was subsequently lost when the manager changed. The other case study suffered with varying commitment of the sponsor, as well as changing sponsors. A significant problem with sponsorship was that often a manager took on the responsibility in name only - the managers took on the title of sponsor, but were not actively involved and most importantly were not committed to the role or the project it related to. The projects lacked clear, consistent and committed sponsorship to ensure complete implementation.

Analysis of Problem Area

The problem situation analysis aspect of the findings was concerned with the apparent lack of investigation into the problem at the outset of the project. In each of the case studies there was little time taken examining what the fundamental problem was. Two of the case studies were initiated from managers' ideas rather than corporate needs. In both the cases there was little or no assessment of whether the initiated project would be affected by, or would affect other changes in PSS. Each of the case studies was eventually superseded by high level IBM strategic projects.

A Framework for Improving the Implementation of Process Based Change

From the empirical work that has taken place, such as the work described above, and from literature reviews it was evident that the successful implementation of process based change required some attention. The latter part of the research has concentrated on developing a framework which would help companies to improve the implementation of their process based change. The framework will be based upon the six themes described above.

Project Planning and Management

This theme of the framework will be concerned with implementing a formal project planning and management system which may contribute to keeping the project to time and ensuring actions are completed on time. One of the main requirements of the project management system will be to plan the project through to complete implementation - the case studies show much evidence of process analysis but little of complete implementation.

Process Based Change

"Process based change" does not always appear to be based on processes, which indicates that some attention is needed. Process based change aspects of the framework are concerned with ensuring that it is genuine process change that is taking place. The framework will aim to ensure that functional boundaries may be crossed when necessary; that processes are being redesigned and not just mapped, that processes and not functions or departments are being examined and that proposed process changes are in line with other process changes and projects which may be going on.

User Involvement

The framework will seek to improve the user involvement issues discussed above. This will include ensuring all groups of users who are affected directly and indirectly are involved in the project, possibly by ensuring a representative of each user group joins the project team. User involvement also includes ensuring communication about the changes is thorough enough to gain commitment from those affected by the changes. User involvement also involves providing appropriate and timely education and training to the users of the new process.

Organisational Culture

From the evidence collected there does not appear to be any assessment of the cultural situation before, during or after a change in PSS. From the empirical evidence there appear to be various organisation culture issues. The framework will aim to uncover any organisation culture issues which may inhibit implementation. An investigation of culture issues may indicate conflicts that may occur when the planned change is incompatible with the current culture. It is possible that an investigation of culture could uncover issues which would otherwise not be addressed.

Senior Management Commitment

It has become evident from all three case studies that top management commitment and sponsorship of the change is essential to ensure improved implementation. Consistent active sponsorship and management commitment throughout the life of the project have been seen to be essential to keep motivation and morale of those involved in projects, high. The senior management commitment part of the framework will focus on ensuring that the highest level of management and sponsorship are genuinely committed to the project, or perhaps that projects do not go ahead if commitment cannot be found.

Analysis of Problem Situation

The problem situation analysis element of the framework will aim to ensure time is taken to consider the problem situation. One of the key problems to deal with is how to ensure that the project is in line with current organisation changes taking place. An assessment of the relevant organisational changes in the wider environment and other relevant factors involved in the problem situation may be included. This could lead to a more informed decision of whether the implementation is appropriate, relevant and essential.

Future Research

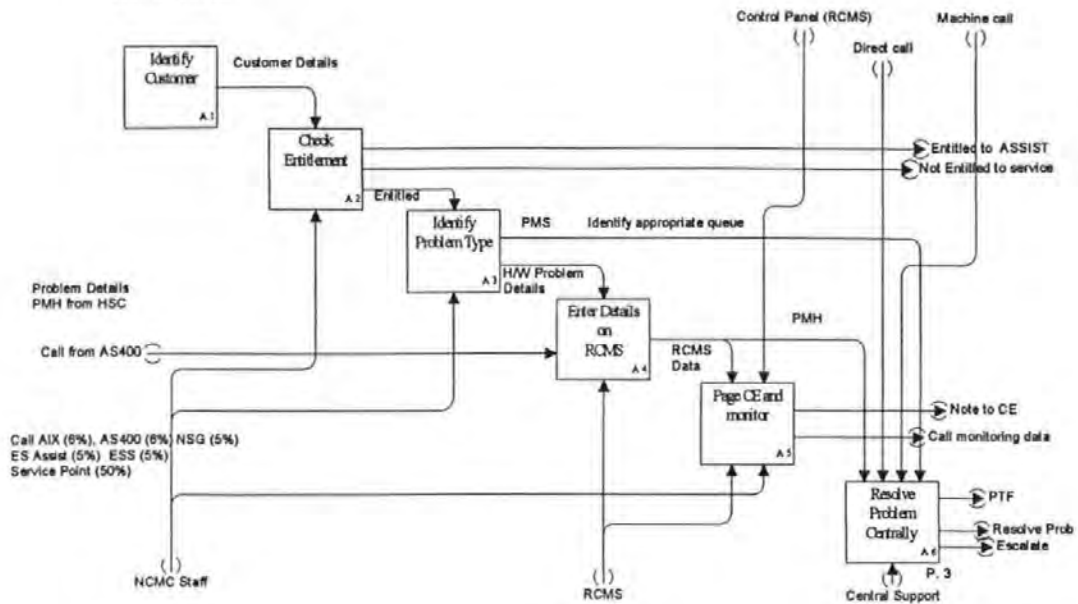
From the completed research work, it has become apparent that there are many factors which inhibit the successful implementation of process based change. The empirical research has attributed the incomplete or unsuccessful implementation to the six themes described above. It has not become evident that one factor is a more inhibiting factor than another. It is more likely that the problem of unsuccessful implementation is a complex one, a systemic property which may only begin to be improved when all the themes are addressed together.

The research project is now focusing on creating a framework which incorporates all the themes affecting implementation. The aim of the framework is to improve implementation. The framework is being created using systems concepts so that a wider view and a better understanding of the changes that are occurring can be gained. 'System', in the sense used here is an abstract idea, which may be described as 'a set of elements connected together which form a whole, thus showing properties which are properties of the whole, rather than properties of its component parts'[xliii]. Another aspect of systems concepts is that investigating the whole problem is useful as the 'whole is greater than the sum of its parts'. These concepts will be particularly useful to examine the themes together as a whole problem rather than as individual problems.

The research project is continuing to develop this framework. The framework is intended to be useful, practical and transferable into other organisations. It is the intention of the researcher to produce a framework which has both academic rigour and industrial relevance.

Figure 1: IDEF0 Diagram of the Call Handling Process

Customer Voice Call



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