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Identification of current IS challenges based on the business/IS alignment model and improving eGovernment services

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**UNIVERSITY OF
PLYMOUTH**

**Identification of current IS challenges based on the
business/IS alignment model and improving
eGovernment services**

by

Sulaiman Alfadhel

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

DOCTOR OF PHILOSOPHY

Plymouth Business School

January 2021

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Dedication

This thesis is dedicated to my beloved parents (father Abdulaziz and mother Husa), my wife Najah and my children, Aljazi, Faisal, Albandari, Rakan and Abdulaziz.

Acknowledgements

First, I would like to express my utmost gratitude to almighty God for giving me the patience, strength and wisdom to complete this work.

My sincere appreciation goes to my sponsors, Emart Alqassim, Interior of Ministry in Saudi Arabia for considering this research topic. This study could not have been realised without their funding.

I would like to express my appreciation to Prince Faisal bin Bandar bin Abdulaziz, Riyadh region governor, Prince Dr Faisal bin Meshal bin Saud bin Abdulaziz, Alqassim region governor and his deputy Prince Fahad bin Turkey for providing valuable support and consideration.

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Last, my biggest thanks go to my beloved wife, Najah Alseleem, and my children for their unconditional and endless love, support and significant inspiration to complete this study and carry on achieving our dreams and goals.

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 without prior agreement of the Doctoral College Quality Sub-Committee.

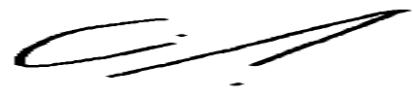
Work submitted for this research degree at the University of Plymouth has not formed part of any other degree either at the University of Plymouth or at another establishment.

This study was financed with a scholarship from Emart Alqassim, Interior Ministry of Saudi Arabia.

Papers have been published and presented by the author based on the PhD work, and the full list of publications has been included in the list of publication section.

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Signed:

A handwritten signature in black ink, appearing to be 'E. Alqassim', written over a dotted line.

Date:

January 2021

Abstract

Information systems (IS) are currently used in various units of the eGovernment sector in order to improve the efficiency, quality, usefulness, rapidity and convenience of their services or products. However, not all governments are able to benefit from the full advantages of IS development due to a lack of alignment between the IS department and other agencies in the eGovernment sector. There is no common framework or model that can be applied globally. Each country develops its own eGovernment programmes based on its needs and other national considerations such as political, economic, cultural and social factors. The literature indicates that eGovernment adoption, uses and development have been considered extensively from the viewpoints of the organization and technical issues. However, there is a need for further investigation to inspect how eGovernment agencies can be aligned so that the efficiency of their services can be improved.

A strong alignment not only assists any government in improving the performance of its services, but it also enhances public trust in the government's services. The concept of alignment is not new, first emerging in the 1970s. Since then, researchers and practitioners have studied the process of alignment in the context of organizational strategic alignment, structural and business goals alignment. This thesis proposes an ideal pattern of alignment for the eGovernment sector in the Kingdom of Saudi Arabia and proposes modelling IS requirements as a suitable solution for strong alignment. The ideal pattern of alignment consists of strategic, structural, social and cultural alignment between the IS department and other agencies in the eGovernment sector.

The study uses a mixed (qualitative and quantitative) method approach to validate the proposed ideal pattern of alignment. For the qualitative study, initially the factors affecting the ideal pattern of alignment are extracted from the literature and validated by the eGovernment experts. The qualitative data were collected from 20 eGovernment experts from different eGovernment sectors in the Kingdom of Saudi Arabia. The thematic analysis approach is identified as a

suitable approach to analyse qualitative data. For the quantitative study, the questionnaire was posted online and possible participants were contacted in the Saudi ministry. The data were collected from 200 eGovernment users in Saudi Arabia. To analyse the quantitative data, confirmatory factor analysis and structural equation model approaches are used. At the process modelling phase, a case study on patient visits to a healthcare clinic is used to validate the method of modelling IS requirements in the context of eGovernment alignment.

The study results indicate: 1) if the eGovernment sector in Saudi Arabia is aligned through this ideal pattern of alignment, improved eGovernment performance and enhanced public trust can be achieved; 2) the eGovernment sector in Saudi Arabia can improve its internal and external relations by focusing on the ideal pattern of alignment; 3) modelling and analysing the government environment have a positive impact on the implementation of IS which meets the needs of the government and consequently positively affects the process of alignment.

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List of publications arising from this study

During this PhD research from May 2016 to November 2019, seven research papers have been published in international journals and refereed conference proceedings. The papers are as follows:

- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2019. Ideal Pattern of Business and IS Alignment for Improving e-Government Services in Saudi Arabia. *Journal of Software, JSW*, 14(2), pp.92-106.
- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2019. Business and Information System Alignment Theories Built on eGovernment Service Practice: An Holistic Literature Review. *Application of Decision Science in Business and Management*, ISBN 978-1-83880-1000
- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2017, May. Business process modelling and visualisation to support e-government decision making: Business/IS alignment. In *International Conference on Decision Support System Technology, in Namur, Belgium* (pp. 45-57). Springer, Cham.
- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2019, June. Investigation of eGovernment Services and Alignment between Business and Information Systems. In *Proceedings of the 2019 3rd International Conference on E-commerce, E-Business and E-Government, in Lyon, France* (pp. 29-33).

- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2018. Ideal pattern of Business and IS alignment for improving e-Government services. 21st Century Research: Optimising Impact from Theory to Practice. Poster, *13th Doctoral Conference, University of Plymouth, Faculty of Business, United Kingdom.*
- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2016. Business and Information System alignment theories built on e-Government service practice, presented at the *2016 International Conference on Decision Support System Technology (ICDSST 2016) held 23-25 May 2016 in Plymouth, United Kingdom.*
- **Alfadhel, S.A.**, Liu, S. and Oderanti, F.O., 2016. Understanding of business and information systems alignment – an initial review. *International Conference of Global Innovation and Knowledge Academy (GIKA), 21-23 March 2016, Valencia, Spain.*

List of acronyms

| | |
|--------------------|--|
| ACM | Association for Computing Machinery |
| AGFI | Adjusted Goodness of Fit Index |
| AIC | Akaike Information Criterion |
| AMOS | Asset Management Operating System |
| BISA | Business and Information System Alignment |
| BPMN | Business Process Modelling Notation |
| CEOs | Chief Executive Officers |
| CFA | Confirmatory Factor Analysis |
| CFI | Comparative Fit Index |
| CIO | Chief Information Officers |
| CMR | California Management Review |
| COBI | Control Objectives for Information and Related |
| eGovernment | Electronic Government |
| eHealth | Electronic Health |
| ePassport | Electronic Passport |
| EQS | Environmental Quality Standard |
| eServices | Electronic Services |
| eTax | Electronic Tax |
| eTax | Electronic tax |
| G2B | Government-to-Business |
| G2C | Government-to-Citizen |
| G2E | Government-to-Employees |
| G2G | Government-to-Government |

| | |
|-----------------|---|
| GFI | Goodness of Fit Index |
| GOMS | Set of Goals, set of Operators, a set of Methods and a set of Selection rules |
| HBR | Harvard Business Review |
| ICT | Information and Communications Technology |
| IEEE | Institute of Electrical and Electronics Engineers |
| IS | Information System |
| IT | Information Technology |
| KSA | Kingdom of Saudi Arabia |
| LISREL | Linear Structural Relations |
| MIS | Management Information System |
| MSMR | MIT Sloan Management Review |
| NFI | Normed Fit Index |
| NNFI | Non-Normed Fit Index |
| OECD | Organization for Economic Co-operation and Development |
| PCLOSE | Pipe Stream to or from a process |
| QQ plots | Quantile-Quantile Plots |
| RMSEA | Root Mean Square Error of Approximation |
| SABIC | Saudi Arabian Basic Industries Corporation |
| SAM | Strategic Alignment Model |
| SEM | Structural Equation Modelling |
| SPSS | Statistical Package for Social Sciences |
| STC | Saudi Telecommunication Technologies |
| UAE | United Arab Emirate |
| UML | Unified Modelling Language |

Chapter 1 Introduction

1.1. Background and motivation

It is widely accepted that information systems (IS) play an essential role in the development, growth and innovation to enterprises of any size. Similarly, in the eGovernment sector, IS play a pivotal role in the success of any government. However, many governments are still not taking full advantage of eGovernment (Garín-Muñoz, et al., 2019; Vicente and Sussy, 2018; Charoensuk, et al., 2014; Ryu, et al., 2014; Jones, 2012). The term eGovernment refers to the use of IS services by government agencies that have the potential to transform relationships with industry, citizens and other arms of government (Al-Busaidy and Weerakkody, 2009; Abdullah et al., 2006). IS technologies can serve a variety of different ends such as better government-run public services, enhanced links between government and business and improved management of government administration (Baker and Niederman, 2014; Kearns and Sabherwal, 2006; Carter and Bélanger, 2005). The trend towards controlling and managing the cost of government services remains unabated and has generated profound renovations, both internal and external, as the majority of governments seek to re-align or re-create their value chain while endeavouring to forge closer associations with public and business partners. In response to or in expectation of changes in their environment, the majority of governments around the world are using information systems for this purpose at a growing rate (Al-Busaidy and Weerakkody, 2009; Gottschalk, 2020; Glyptis, et al., 2020; Wu and Vyas, 2020).

Consequently, this has raised a primary question fundamental to the current business paradigm: how can a business organization actually justify its information system investments in the context of contributing to business performance, be it in terms of efficiency, amplified market share, effectiveness of knowledge management (KM) in the context of project or services management (Ochieng, et al., 2018; Mitra and Ruan, 2014), productivity or other indicators of organizational success? However, the process of managing and providing IS services to any government is a difficult job due to rapid changes in the government environment and a lack of alignment between government and IS departments. Strong alignment between IS and other government departments can ensure better administration and organizational performance in many ways such as strategic, social, cultural and structural performance (Gerow, et al., , 2015; Ryu, et al., 2015; Alanezi, et al., 2012; Gartlan and Shanks, 2007; Cragg, et al., 2002). The literature shows that researchers have studied alignment in a variety of contexts, for example considering the differences between business and information systems from strategic, structural and cultural perspectives (Alkhuraiji, et al., 2016; Pollalis, 2003; Durand, et al., 1995).

From the early 1960s, information systems have been characterized by rapid development and integration with business, becoming essential components of most business organizations and industrial firms. Most business organizations in all sectors of industry, government, commerce, academia and health in developed countries are fundamentally reliant on their information systems (Coltman, et al., 2015). For business organizations to remain competitive in an active business environment, it is necessary for them to establish and understand how to manage their information systems systematically. A key contributor to the successful operation of a profitable

business in the contemporary business environment is an effective and efficient information system which supports business strategies and processes (Henderson and Venkatraman, 1993). Strong alignment between information systems and other eGovernment departments can improve the performance of any government or business organization.

The concept of alignment is not new, first emerging in the early 1970s. Since then it has been examined from a number of different perspectives such as strategic (Kitsios and Kamariotou, 2016; Benkhayat, El Manouar et al. 2015; Bharadwaj, et al., 2013; Asato, et al., 2011; Broadbent and Weill, 1993), social (Høgevoid et al., 2019; Gbededo and Liyanage, 2018; Moon et al. 2018; Gallotti et al., 2017; Heaselgrave and Simmons, 2016; Korhonen and Kaidalova, 2015; Karahanna and Preston, 2013; Teddlie and Tashakkori 2003, Reich and Benbasat, 2000), knowledge integration for business organization performance (Ruan, et al., 2013), structural (Bisoyi and Li, 2019; Liu, et al., 2016; Mirchandani and Lederer, 2014; Chung, et al., 2005; Durand, et al., 1995) and cultural (Shao 2019; Friedman, et al., 2018; Heaselgrave and Simmons, 2016; Ravishankar et al., 2011) aspects. In relation to the organization's strategic directions, organizational factors such as formal business and formal information system strategy were considered in terms of alignment.

In relation to the social point-of-view of the organization, factors such as a lack of: shared domain knowledge; information system knowledge in the business department and business knowledge in the information system department, were considered (Shao 2019; Friedman, et al., 2018; Heaselgrave and Simmons, 2016; Ravishankar et al., 2011). With regard to the organization's structure, academics considered

complex structures and rapid changes in structure. Pertaining to the organization's culture, they investigated the lack of communication, frail relationships and insufficient belief in the efficacy of information systems within the business organization (Ullah and Lai, 2013; Luftman and Brier, 1999). Table 1-1 summarizes the top governmental and other organizational concerns from 2008 to 2018 (Leon Kappelman, et al., 2019), showing that the issue of business-IS alignment was ranked number one in every year.

Table 1-1: Ranking of top government and organizational concerns

| 2008 Rank | 2009 Rank | 2010 Rank | 2011 Rank | 2012 Rank | 2013 Rank | Factors | 2014 Rank | 2008 Rank | 2015 Rank | 2016 Rank | 2017 Rank | 2018 Rank |
|-----------|-----------|-----------|-----------|-----------|-----------|--|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | 1 | 1 | 1 | 1 | 1 | Business-IS alignment | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 3 | 2 | 3 | 8 | 6 | IS budget | 6 | 6 | 2 | 2 | 3 | 2 |
| 2 | 2 | 3 | 2 | 2 | 5 | Relationship between business and IS | 5 | 5 | 3 | 4 | 2 | 3 |
| 4 | 5 | 4 | 4 | 3 | 4 | Finding right skilled for particular job | 4 | 4 | 5 | 3 | 4 | 4 |
| 5 | 4 | 5 | 5 | 4 | 3 | Change management in the organizations | 3 | 3 | 4 | 5 | 5 | 5 |
| 6 | 8 | 6 | 6 | 6 | 2 | Extracting and gathering business and IS requirements. | 2 | 2 | 6 | 6 | 6 | 6 |
| 7 | 2 | 7 | 7 | 5 | 8 | Lack of IS trust among business staff | 8 | 8 | 7 | 7 | 7 | 7 |
| 8 | 7 | 8 | 8 | 7 | 7 | Shared domain knowledge between business and IS | 7 | 7 | 8 | 8 | 8 | 8 |

So far, research on alignment issues has been conducted from many perspectives including business process alignment, strategic alignment, structural alignment, business goals alignment. The research aims and objectives are detailed in Section 1.3.

1.2. Research scope

An eGovernment is the process of using information systems and communications technology, such as the World Wide Web, to provide public services to citizens. eGovernment is not new, as governments were amongst the first users of information technology. However, the global propagation of the World Wide Web, which efficiently integrates information systems and communication technologies on the foundation of open standards, together with the movement to improve public administration, has created a new wave of interest in this field. eGovernment aims to make governments more resourceful, reactive, transparent and accurate and is also creating a quickly growing market of products and services, with a diversity of new business opportunities. The process of alignment in the field of eGovernment can improve the performance of every sector of any government. However, alignment between business and information systems in the context of eGovernment has not been discussed by researchers (Ullah and Lai, 2013; Ullah and Lai, 2011).

Alignment researchers and practitioners have focused their attention on the significance of alignment in other areas of business, yet still, in this advanced technological world, this issue is one of the high priority issues dominating business and information technology management. Since the concept emerged in the 1970s, researchers have been under pressure to address the problem of alignment between business and technological strategies. Early approaches were ad hoc, given the level of resistance in business organizations regarding their viewpoint on information systems departments. These hypotheses have prevailed over time and currently,

scholars point to many concerns and challenges, and have developed dissimilar alignment approaches, techniques and models (Cragg, et al., 2002; Earl and Feeny, 1994).

The most serious drawback of early techniques was the way of planning the business organization and information system structure. Early on, IS development was only categorized into top down and bottom up business processes, for instance, on the business side, the organization was further categorized into different departments for example, human resource management, finance, marketing, information systems and on the technology side, the business structure was categorised into two levels: technology hardware and software, to establish the connection between business and information system departments (Yu, 2014; Ullah and Lai, 2013).

This structural problem was disadvantageous to the overall business organizational performance whereas the process of successful information system alignment enhances the profit of the business organization. Several studies in the literature show that business organizations that productively align their business strategy with their information system strategy are far more successful than those that do not (Luftman, 1993). The existing alignment information techniques and approaches are mostly business driven rather than information system driven. Information systems need to support the business organization. All these issues motivate alignment scholars and researchers to study alignment from the information system side rather than the business department side (Luftman, 1993).

There have been concerns over alignment since its emergence and certain problematic issues persist today in relation to business and information system management. A review conducted in 2007 of business organizations in Australia showed that the difficulty of alignment is genuine and Australian business organizations are seriously dependent on information system services to the extent that failure to align business with information systems could jeopardise the success of the business. Furthermore, the information management society undertook a review of the prominent issues concerning business organizations, finding that business organization and information system alignment problems ranked number one for three consecutive years, 2003, 2004 and 2005 (Ullah and Lai, 2013; Luftman, et al., and Oldach, 1993).

The primary management and business organization concerns from 2005 to 2008 were as follows: business strategy uncertain; formal strategy; domain knowledge; lack of skills; lack of information system awareness; lack of business awareness; lack of information system alignment awareness; management decisions; and rapid changes in the business organization. These concerns show that the difficulty associated with alignment was ranked number one every year over this four-year period. In the context of the research gap, some business/IS alignment scholars believe that the proposed alignment models fail to capture the real advantages of alignment due to an unclear business strategy and also due to the rapid changes from a business perspective to a technological perspective (Schlosser, 2015; Ryu, 2015; Asato, 2011; Meijer, 2010; Chen, 2008; Durand 1995).

However, in the context of the eGovernment sector and alignment between business and IS, it is important to design the type of eGovernment before outlining the research scope. Baldauf and Zimmermann (2020) suggested four types of eGovernment namely: Government-to-citizen (G2C), Government-to-employee (G2E), Government-to-business (G2B) and Government-to-government (G2G). This research focuses on G2C, in which we consider the primary goal of eGovernment to service citizens and enable residents to collaborate with government bodies by enabling them to access government-related information through the use of electronic media such as websites (Liu, et al., 2020; Li and Shang, 2020; Ningsih, et al., 2013). This method of communication between citizens and eGovernment save both parties time and money.

The scope of this research is divided into two phases. In phase one, we propose comprehensive patterns of alignment for a better solution to G2C eGovernment, which is categorized into four critical success factors derived from the literature: strategic, structural, social and cultural alignment. The outcome of phase 1 is confirmation of the situation of alignment in the eGovernment of Saudi Arabia, such as what is the current situation in relation to alignment? Which processes of alignment are weak in the eGovernment sector of Saudi Arabia? Why isn't the Saudi Arabian government able to take full advantage of information systems? Therefore, it is important to provide a suitable solution for alignment, for example how can information system departments and other agencies in the eGovernment sector be aligned? According to Ullah and Lai (2011), business process modelling and the derivation of information system requirements from the business process ensures the development of a system which fulfils eGovernment needs. This is considered to be the successful alignment between business and information system departments. In phase two, we provide a solution for

eGovernment, which is the development of a suitable information system, but this is only possible if we are able to model business goals and obtain the system requirements from the business goals. Establishing clear system requirements assists developers to develop a system which meets the government's expectations. The results of this study suggest the need for a strong relationship and working environment between information systems and other government departments which will improve the overall performance of the eGovernment of Saudi Arabia.

1.3. Research aim, objectives and questions

It is widely accepted that the positive alignment of information systems and business can increase organizational performance and increase an organization's reputation in the marketplace; however, attaining strong alignment is a difficult task due to the lack of suitable alignment methodologies, rapid changes in the business environment and inadequate information system techniques to cope with such changes (Akter, et al., 2016; Ullah and Lai, 2013; Ullah and Lai, 2011a). Research into the influence of business and information system alignment on business performance has been conducted from the perspective of a strategic alignment fit and a structural alignment fit among business and information systems; however to date, there is no published work on the influence of business and information system alignment on business performance which includes strategic fit, structural fit, social fit and cultural fit among business and information systems (Abdullah, et al., 2006; Al Ghoson, 2010; Ullah and Lai, 2013; Ullah and Lai, 2011a).

Based on a co-variation viewpoint of fit and the idea of co-alignment, in this research we empirically examine the impact of alignment patterns between business strategy,

business structure, business culture, business social issues, information systems strategy, information systems structure, information systems culture and information system social issues on business performance by surveying small-sized government business organizations in Saudi Arabia.

Moreover, these patterns of alignment are measured based on several factors, for example, the strategic alignment pattern is measured based on the effectiveness of IS planning, IS strategy and eGovernment strategy in the eGovernment sector. The structural alignment pattern is measured based on eGovernment and IS structural complexity and the measurement of IS support provided to the eGovernment sector. The social alignment pattern is measured based on effective communication between the top management of the eGovernment and IS department, shared domain knowledge between business and IS and the effective support of the CEO and CIO for strong alignment. The cultural alignment pattern is measured based on the effective communication between IS and business staff, cultural relationships, strong working relationships and effective leadership.

This research proposes an ideal pattern for Business and Information System Alignment (BISA) to fill the gap in understanding how alignment is achieved and measured in business organizations in a dynamic eGovernment environment. Moreover, this study will enable IS managers from the eGovernment sector to gain an advantage from information systems, as it empirically investigates the basic problem of information systems for organizations which need to continually increase their rate of investment in information systems to show how value can be gained from information system investment.

A summary of the objectives of the research is as follows:

- ✚ to understand the current challenges of IS based on the alignment concept in the context of business performance and eGovernment;
- ✚ to identify the critical success factors of alignment in relation to the performance of business and government sectors;
- ✚ to identify the barriers and enablers of the alignment of eGovernment with organisational performance;
- ✚ to develop a conceptual framework for BISA in eGovernment services;
- ✚ to evaluate the process of alignment with a real-world case study;
- ✚ to suggest alignment strategies that can improve the performance of business organizations in Saudi Arabia;
- ✚ to evaluate and enhance the understanding of alignment method implications in Saudi Arabia, particularly in terms of better performance and higher satisfaction.

Alignment between business and information systems is the degree of fit and incorporation between business strategy, information system strategy, business infrastructure, and information system infrastructure. The following research questions have been formulated:

1. What are the key patterns and their organizational factors that affect the alignment process in eGovernment services?
2. How can business and IS disciplines be aligned in the eGovernment sector in Saudi Arabia?

3. How can the alignment process in the context of eGovernment be improved and what is the role of process modelling in this context?

1.4. Research contributions

This thesis makes several contributions to the research discipline of eGovernment and business-IS alignment. The contributions can be seen from multiple viewpoints.

First, an eGovernment experts' point of view on the eGovernment sector in S.A: In this research we examine the proposed framework of the ideal pattern of alignment among eGovernment experts from the ministry of eGovernment in Saudi Arabia. The study results reveal that the government of KSA is still not able to attain its goals due to a lack of alignment among government agencies. Therefore, eGovernment experts in the country recommended that this ideal pattern of alignment could facilitate increased eGovernment performance in terms of the provision of high-quality eGovernment services and win the public's trust.

Second, an eGovernment customers' point of view about eGovernment services in S.A: The Saudi Arabian government currently allocates a huge budget on infrastructure and technologies to increase the country's efficiency. However, the key challenge to eGovernment in the country, which is a lack of alignment between information system departments and other government agencies still remains. This has led to a lack of citizen awareness of KSA eGovernment services in the country.

In this research, a framework for an ideal pattern of alignment for the KSA government is proposed. The framework is based on four types of alignment between government agencies and IS departments: strategic, structural, social and cultural alignment. The framework is evaluated by eGovernment users in KSA and the results reveal that typically, eGovernment users in the country are happy with the current facilities that the KSA government is presently providing, however some government processes are still manual and time consuming. Therefore, eGovernment users in the country require more eGovernment services which is only possible through strong alignment between eGovernment agencies and IS department.

Third, Business-IS alignment and eGovernment performance in Saudi Arabia: The term alignment between business and IS in the context of eGovernment is a notion that is believed to be critical in understanding how government can interpret and justify their utilisation of IS to increase government performance as measured by the level of satisfaction of its citizens in relation to government services, such as eTax, Medicare, the Passport office, and an effective way of managing pension process. Research is conducted on the impact of alignment between business and IS on eGovernment performance in relation to two patterns of alignment: structural alignment between business and IS; strategic alignment between business and IS. However, the literature indicates that the eGovernment sector faces many challenges due to a lack of alignment in terms of the cultural and social issues of the organization.

In this thesis, we study the impact of an ideal pattern of alignment which is based on four factors: strategic alignment between business and IS, structural alignment between business and IS, cultural alignment between business and IS and social

alignment between business and IS. The research results indicate that an eGovernment sector which is aligned in these four factors can achieve high eGovernment performance and can win the citizen's trust. Moreover, the results show that the eGovernment sector in Saudi Arabia can improve their internal and external relations by focusing on this ideal pattern of alignment.

Fourth, Business-IS alignment and business process modelling in the eGovernment sector: It is widely accepted that the establishment of strong alignment between business and IS requires suitable and up-to-date system support from an IS department. However, the development of a suitable system which meets eGovernment needs not only requires a suitable process of system requirements engineering, the eGovernment process must also follow a model before commencing the system development. In this thesis, we modelled one of the eGovernment processes and derived the system requirements with the aim of proving that process modelling is important for aligning business and IS in the context of the eGovernment sector.

1.5. Thesis structure

This section provides an overview of the thesis, as shown in Figure 1-1. The thesis has in total nine chapters. Chapter one presents an introduction covering the background and purposes of study, study aim and objectives, research questions and the key contributions of this research.

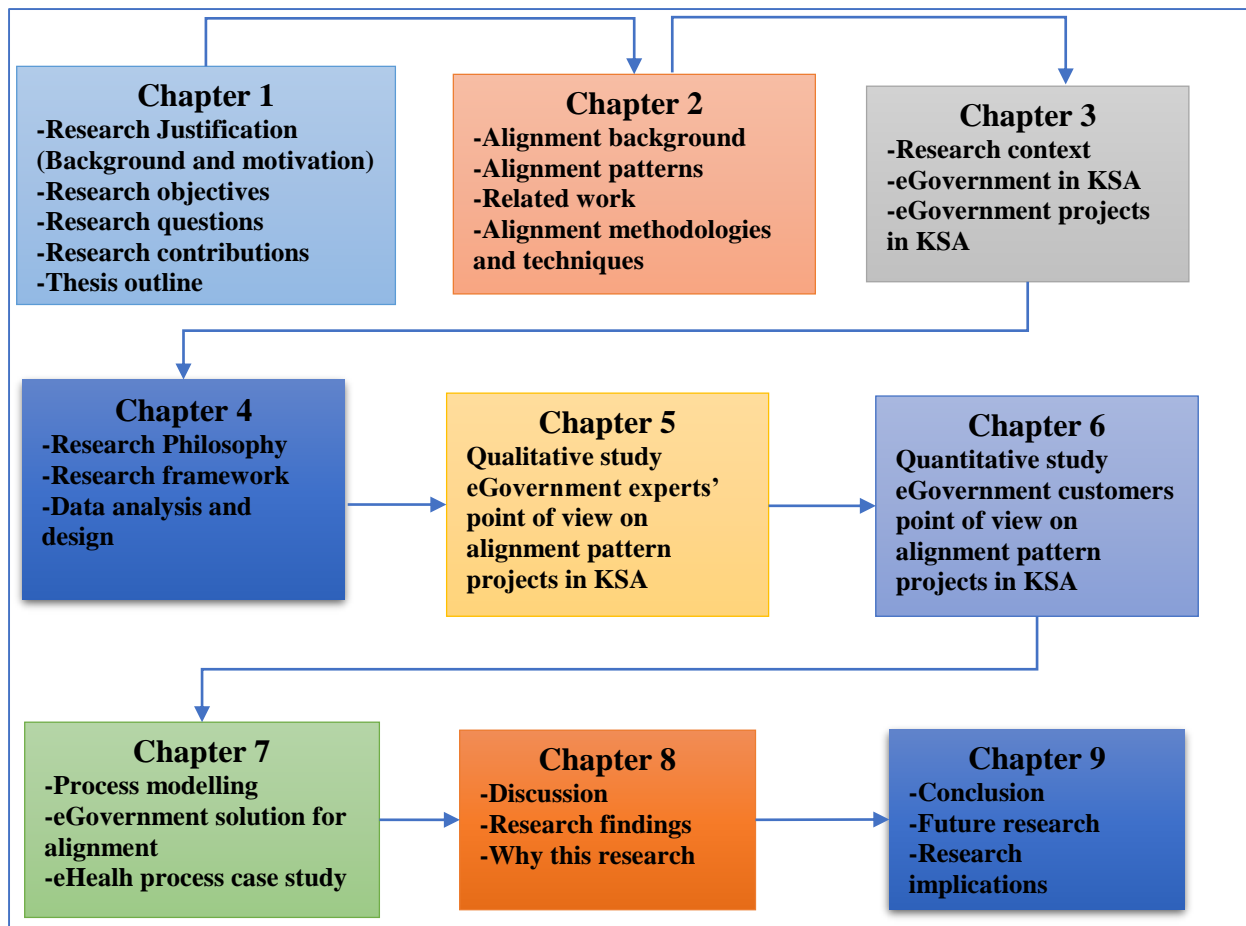


Figure 1-1: Thesis Structure

- Chapter 2. Literature Review: This chapter investigates previous studies on business and information system alignment holistically in the context of developing strong working relationships between professionals from business and IS backgrounds in eGovernment and large business organizations, while examining alignment studies that allow the development of IS which is suitable, on-time and within budget. Alignment plays a vital role in the formation of dependent relationships between people from two different groups and the performance of alignment can be improved by developing an IS according to the stakeholders' expectations. The chapter summarized the following: to identify the barriers and enablers of alignment and eGovernment; to identify the critical success factors of alignment in relation to eGovernment performance;

to evaluate and enhance the understanding of alignment methods for future research directions.

- Chapter 3: Research background: The Kingdom of Saudi Arabia. Before we propose a framework of alignment for the eGovernment sector of any country, it is important to understand the country's situation in the context of public interest; the country's demographic information; demand for technology; technology and its impact on climate change; eGovernment services; the country's economy situation; culture and willingness to learn how to use eGovernment services. This chapter presents the background and the current situation in the Kingdom of Saudi Arabia with brief information about the importance of religion along with the type of administration present in the nation. Moreover, information related to the aspects of the nation includes country demographic information; the climate; economy; culture and current eGovernment development in Saudi Arabia. These aspects may prevent or encourage eGovernment applications in the country. The chapter also discusses the nation's information technology plan and information technology programs related to eGovernment and aspects that are likely to encourage the development and implementation of eGovernment.
- Chapter 4: Research Methodology. This chapter discusses the research methodology which is adopted in the proposed research process in order to collect, accumulate and evaluate study data. The chapter defines tools that are used to gather relevant information in this research study. The chapter also gives an outline regarding the course of this study and the method of its

implementation such as the method of data collection and analysis and research design.

- Chapter 5: Qualitative Study. This chapter examines the impact of the ideal pattern of alignment in the eGovernment sector in Saudi Arabia. The data is collected from 20 eGovernment experts from the eGovernment Ministry in Saudi Arabia.
- Chapter 6: Quantitative Study. Over the past few years, governments from all over the world have been losing general public trust. This lack of public trust presents a significant challenge to public officers, citizens and politicians as it decreases community confidence in public officers and political performance and generates disappointment with community support and services. Public trust and confidence can be achieved through establishing strong alignment between information systems departments and other government agencies. Alignment is a process where every stakeholder in the government infrastructure works together to achieve common business objectives. This chapter presents and analyses a quantitative survey among eGovernment users in Saudi Arabia to evaluate an ideal pattern (strategic, structural, social and cultural) of alignment with the aim of improving government services in the country.
- Chapter 7: Business process modelling: A strong alignment among business and information system departments in the context of eGovernment plays an important role in the formation of dependent associations among people from

two different groups in the organization. However, establishing alignment in the context of the eGovernment atmosphere could be problematic. It is undeniable that Government processes in the eGovernment environment play an essential role in capturing the details of information system requirements that help to develop systems that meet the needs of the Government. As a result, this improves the process of alignment in the eGovernment sector. This chapter presents a method of business process modelling and analysis for information system requirements elicitation. A case study on patient visits to a healthcare clinic in the context of eGovernment is used to evaluate the process modelling technique.

- Chapter 8: Analysis and discussion. This chapter describes the analysis results of each selected pattern of alignment and discusses the benefits that can be derived from qualitative and quantitative studies for the eGovernment sector in Saudi Arabia. Moreover, the chapter summarizes the research findings and discusses how process modelling for alignment in the eGovernment sector can help to improve non-alignment issues.
- Chapter 9: Conclusions: This chapter concludes and evaluates the work of this research. It also summarises the current and future challenges in this research area and the implications of this research.

The thesis comprises two appendices at the end: Appendix A contains the research questionnaire and information sheet and Appendix B contains the Plymouth University Ethics Committee approval letter.

1.6. Summary

This chapter presents an introduction to the research which comprises a statement of the background of the research problem that deals with both the historical as well as present-day state of alignment between business and information systems in the context of eGovernment and how these different aspects may prevent or encourage eGovernment applications. In addition, this chapter discusses the aim and objectives of the study, its contributions and the significance of the research and the thesis structure.

The next chapter presents the literature review on the proposed topic, which includes the origin of alignment, definitions of alignment, directions of alignment, eGovernment methodologies and alignment, the research gap and future research directions.

Chapter 2 A literature review

2.1. Introduction

The trend toward the globalization of the business organization environment remains unabated and has generated profound innovation, both internal and external, as most organizations seek to re-align or re-create their value chains while endeavouring to forge closer associations with their consumers and business partners. In response to or in expectation of changes in their environment, most organizations are using information systems for this purpose at a growing rate (Ullah and Lai, 2013, 2011; Al Ghoson, 2010). Consequently, this has raised a primary question fundamental to the current business paradigm: how can a business organization actually justify its information system investments in the context of contributing to business performance, be it in terms of efficiency, amplified market share, productivity or other indicators of organizational success (Flores, Ramírez et al. 2018; Akter, Wamba et al. 2016; Kitsios and Kamariotou 2016; Karahanna and Preston 2013; Chung, Byrd et al. 2005; Bergeron, Raymond et al. 2004).

From the early 1960s, information systems have been characterized by rapid development and integration with business, becoming essential components of most business organizations and industrial firms. Most business organizations in all sectors of industry, government, commerce, academia and health in developed countries are fundamentally reliant on their information systems (Coltman, et al., 2015). For business organizations to stay competitive in an active business environment, it is necessary for them to establish and understand how to manage their information systems systematically. A key contributor to the successful operation of a profitable

business in the contemporary business environment is an effectual and efficient information system strategy supporting business strategies and processes (Benkhayat, et al., 2015; Chen, et al., 2015; Foss and Lindenberg, 2013; Asato, et al., 2011; Chen, et al., 2008; Gartlan and Shanks, 2007; Durand, et al., 1995).

This chapter discusses and evaluates the literature on the eGovernment sector and alignment between business and IS. This chapter covers what is alignment, the origin of alignment, the factors that impact alignment in the context of the eGovernment sector, types or directions of alignment, methods and techniques of alignment and based on this information a theoretical framework is proposed. The next section briefly discusses the chapter's aim and the background to the topic, before reviewing previous studies on alignment between business and information systems from different viewpoints. A holistic framework for alignment in the context of eGovernment is then presented, followed by the method used in this chapter and a discussion of the study's results. Finally, it highlights future research directions for further research.

[2.2. Context of literature review and origin of alignment](#)

The aim of the chapter is to investigate the process of alignment between business and information systems holistically in the context of eGovernment (Ullah and Lai, 2013). We conducted business and IS research on alignment, with reference to eGovernment services. The method section summarizes the way we conducted the holistic review and the total number of articles selected which were relevant to this topic.

This research provides detailed information on alignment in the context of eGovernment practices and summarizes previous research findings, particularly in the

context of strategic, structural, social and cultural issues in business organizations, as well as engineering requirements to achieve better information system performance.

The following questions have been considered to search for relevant articles:

- What are the critical success factors of alignment with respect to eGovernment and organizational performance?
- What are the benefits of existing alignment methods and technologies?
- What are the barriers and enablers of the alignment of eGovernment with organizational performance?

The notion of alignment originated from a body of theoretical and empirical work within the business organization literature whose primary proposition is that organizational performance is the result of relationships between business and information systems. Maintaining relationships between business and information system departments, bridging the communication gap, aligning structure, and improving information system trust within a business organization have become progressively more important for organizations, CIOs and CEOs (Parry and Lind, 2016; Odiit, et al., 2014; Rahrovani, et al., 2014; Ravishankar, et al., 2011; Pollalis, 2003; Reich and Benbasat, 2000).

The process of alignment is important to business organizations for several reasons. The key advantage is to simplify the overall business organizational goals and objectives and to professionally identify the role of information systems to better support the business organization to achieve its goals and objectives (Rahrovani, et al., 2014; Ravishankar, et al., 2011). The secondary advantage is that the alignment of information systems allows business organizations not only to recover their

business scope, but their infrastructure as well, by harmonizing their relationship with their information systems (Pollalis, 2003; Reich and Benbasat, 2000).

Furthermore, managing information system processes will improve the worth and productivity of the business (Bisoyi and Li, 2019; Akter, et al., 2016; Aslam, et al., 2016; Benkhayat, et al., 2015; Ullah and Lai, 2011). This synchronization between information systems and business will increase over time as information technology starts impacting every stage of the business organization, such as the project stage, strategy stage, planning stage and so on (Ullah and Lai, 2013). However, it is well documented that business organizations which were based on conventional business strategies failed to take full advantage of information systems (Bergeron, et al., 2004; Pollalis, 2003) and instead, used information systems only at the back end of the system or considered it as a disbursement rather than a business organization value enabler (Brynjolfsson, 1993).

The idea of alignment emerged in the early 1970s (Bleistein, et al., 2006). Since this time, alignment researchers have been under pressure to approach the problem by aligning business strategies with technological strategies. Early approaches met with some resistance from within businesses to integrate their information systems departments (Chopra and Singh, 2015; El-Masri, et al., 2015; Charoensuk, et al., 2014; Chan and Reich, 2007; Bleistein, et al., 2006; Bleistein, et al., 2005; Campbell, 2005). These hypotheses have prevailed over time and nowadays, academics point to many concerns and challenges, and have developed new alignment approaches, techniques and models.

[2.3. System theory and phases of literature review](#)

A review of the literature shows that recent studies on alignment between business and eGovernment suggest two main IS theories in the context of internal and external organizational issues, namely system theory and network theory (Prenekert, et al., 2014). System theory is the interdisciplinary theory of IS in general, with the aim of identifying patterns and clarifying principles that can be distinguished from, and functional for all types of IS at all nesting levels in all fields of IS research. This theory's main focus is on internal organizational relationships (Prenekert, et al., 2014). Network theory examines the business organizational structure in relation to the organizational social aspect. These theories tend to place more emphasis on the business structures and dynamics of social relationships (Luftman, et al., 1993).

However, due to the nature of this research, we have used system theory to underpin this study. A system is a combination of subsystems or parts that are integrated to accomplish the overall business goals (Rakgoale and Mentz, 2015; Ullah and Lai, 2013). Moreover, the system in an organization has numerous inputs, which go through several processes to obtain accurate outputs to achieve the overall system goals. An organization is made up of many departments or divisions, such as finance, marketing, administration, which require system support to achieve common business goals. However, the nature of the business which distributes the alignment processes between business departments and IS often changes (Argyris, 1993).

Systems theory helps in the understanding of the different organizational factors that contribute to strong alignment and helps to identify the relations among the factors or patterns of alignment.

After understanding and selecting systems theory, we discuss the phases involved in conducting the literature review and identify the factors that affect the alignment process in the context of the eGovernment environment. The literature review chapter has two phases, as shown in Figure 2-1. Phase one of the framework presents the qualitative and quantitative studies on alignment while phase two presents goal modeling in the context of organizational requirements and the development of suitable eGovernment IS.

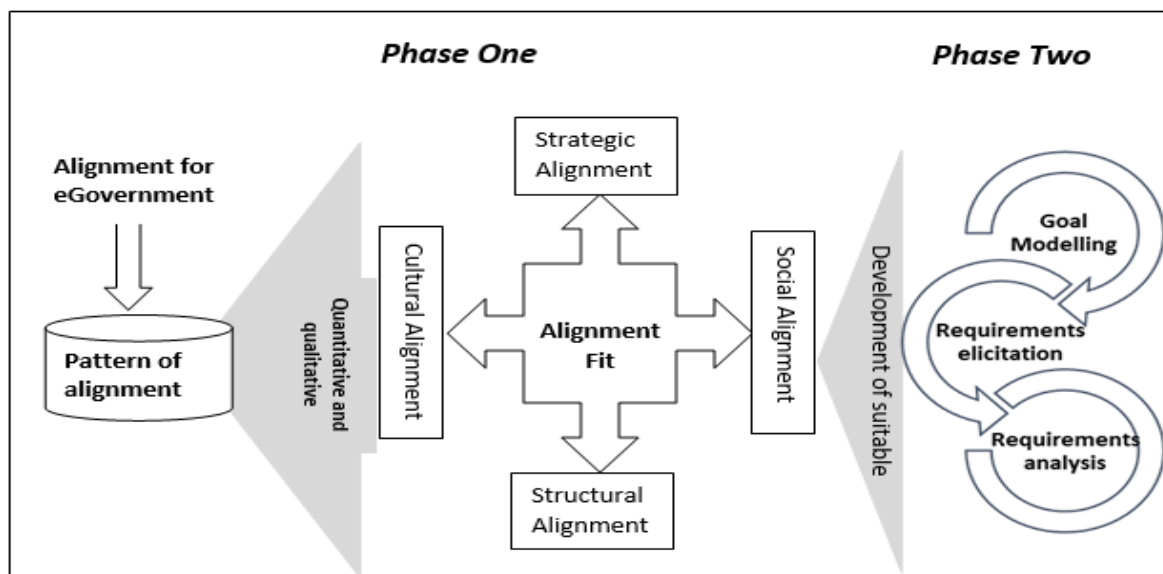


Figure 2-1: Phases of the literature review

To conduct this study, we searched for manuscripts published in reputed journals and conferences during the period between January 1977 to October 2019 dealing with government information systems (or eGovernment) or information technology. The reason we started searching for articles from 1977 is due to the revolution of IS and the business environment. In the 1960s or before, most IS projects failed to fulfill the business needs due to a lack of alignment between IS and business (Coltman, et al.,

2015). 1977 was the year when researchers and practitioners proposed alignment to establish a suitable and profitable organizational environment.

The first step of our literature review was to identify the top journals and conferences in which most researchers publish their research on alignment and related topics. Our initial list of information systems and information technology journals included the *Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of Management*, *MIS Quarterly*, *European Journal of Information Systems*, *Information and Management*, *Journal of Computer and Security*, *International Journal of Information Management*, *International Journal of Management Reviews*, *Information Technology* and *Journal of Strategic Information Systems*. To these we also added the leading practitioner-oriented journals, namely, the *Harvard Business Review (HBR)*, *California Management Review (CMR)* and MIT Sloan Management Review (*MSMR*). Focusing on manuscripts that contain the terms “*alignment*” or “*synchronization*” in the title or keywords, our preliminary search identified 31 manuscripts on business and information systems alignment. Of these, 26 had been published in information systems and information technology journals while five appeared in *HBR*, *CMR*, and *MSMR*.

However, the selected set of manuscripts on alignment were relatively few which led us to extend our search to the IEEE digital library, Web of Science and ACM digital library databases. These databases include more than 1000 information systems journals with the most complete sources of information systems and information technology studies. We searched these databases for academic manuscripts published between January 1977 to October 2019 containing the terms “*alignment*” or

“*synchronization*” in the title, abstract, keywords or conclusion. As a result, we obtained 210 manuscripts, which we added to our preliminary sample of 31 manuscripts. Since 15 of the newly added manuscripts were already in the preliminary sample, our overall sample totaled 117 manuscripts, with the details shown in Figure 2-2.

The method of inclusion and exclusion starts with a preliminary quick analysis of the manuscripts, performed by reading each manuscript title, abstract, introduction and conclusion which showed that not all the manuscripts that we identified during the search would be useful for inclusion in this holistic review on alignment. Several of these manuscripts were summaries of manuscripts published elsewhere, and there were also several studies in which the alignment between business and information systems was not a theme of the research.

To classify the relevant manuscripts, we adopted the following two additional criteria for our review on alignment between business and government information systems (eGovernment). Firstly, a manuscript must refer to the alignment between business and information systems as a concept associated with business organizations (e.g. organizational strategy, structure, culture) to be included in this research. Secondly, a manuscript must deal with the alignment notion in a non-trivial and non-marginal way. As a result of this process, we eliminated 42 manuscripts that did not meet these criteria, which left us with a sample of 75 manuscripts.

While studying these 75 manuscripts in detail, we identified further work on alignment. For example, some work appeared relevant, however, due to difficulties associated with limited access, we only added work which was available. We also found

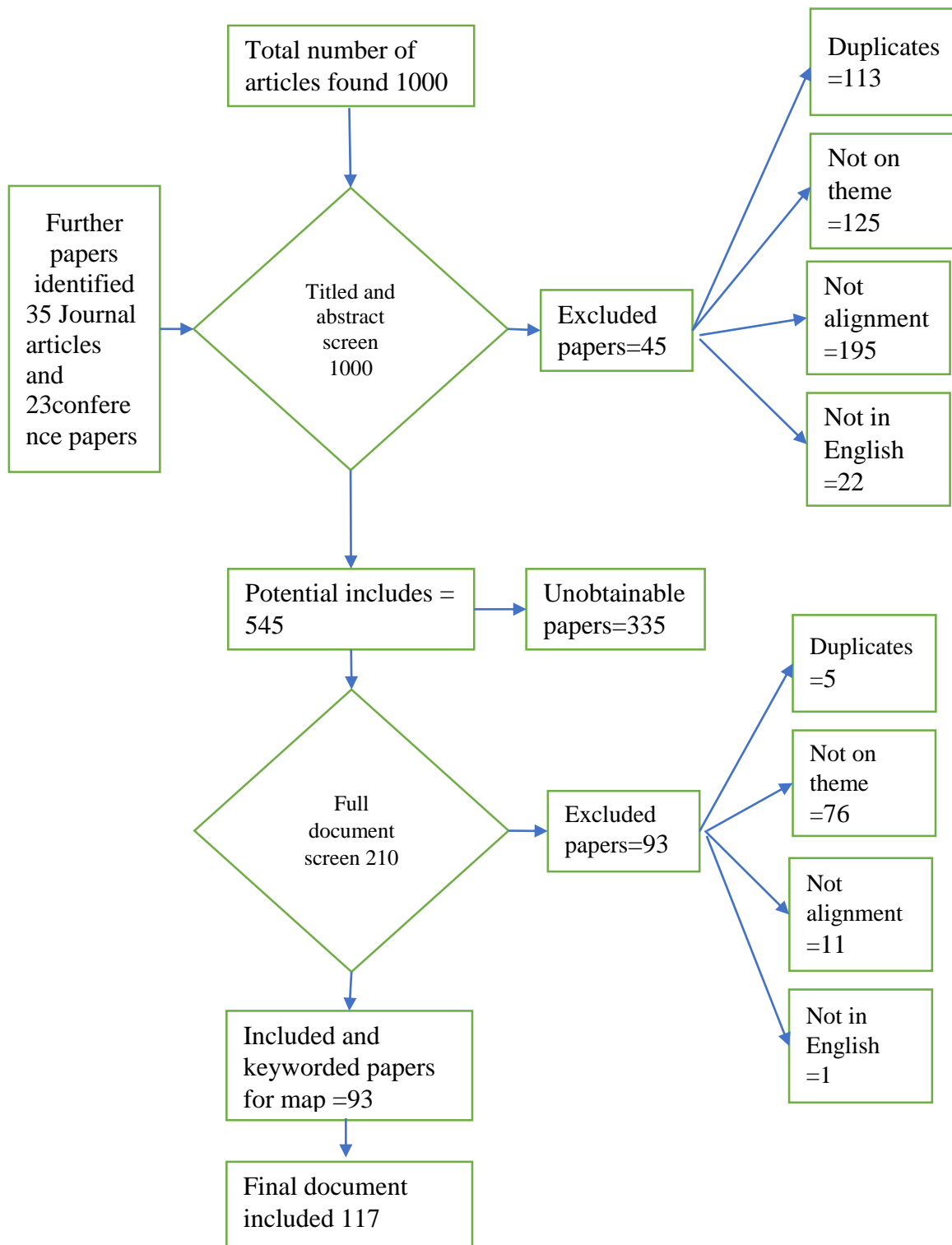


Figure 2-2: Method of selecting articles

several relevant working papers that our selected databases had failed to identify, some of which had been subsequently published. Moreover, our thorough study of these manuscripts also allowed us to exclude papers in which alignment was treated in an inconsequential way. Therefore, the final sample of selected manuscripts comprised 80 studies. Figure 2-3 shows the selected articles from 1977 to 2019.

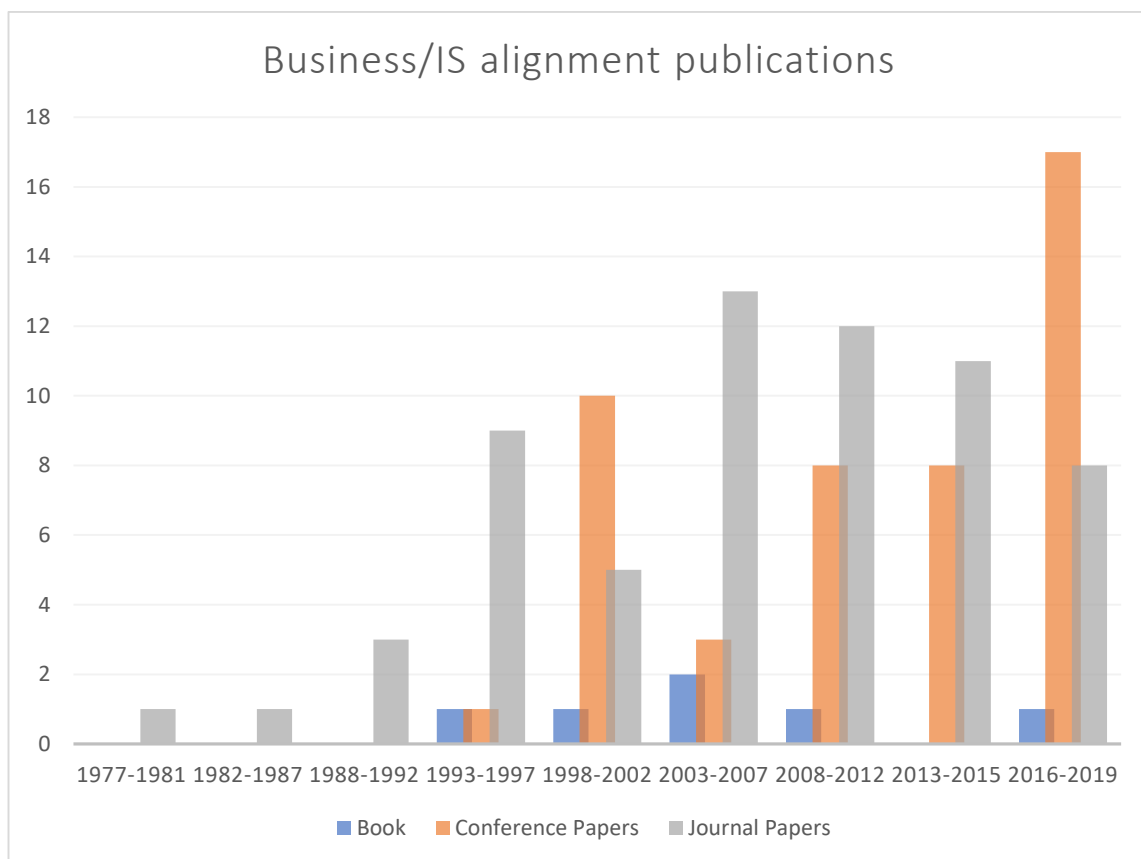


Figure 2-3: Selected publications

2.4. Review results

2.4.1. The evolution of the alignment concept

This section presents an analysis and discussion on the selected articles and overviews what we learned during the research on alignment between business and Government information systems. Each selected article was analyzed in the context

of alignment terminology, alignment definitions, alignment directions, alignment models, system modeling for alignment and eGovernment and the future of alignment.

Alignment terminology: the issue of alignment has been studied by researchers from different business perspectives such as health, education, banking, construction and so on. The concept of alignment has been discussed using different terminology, including alignment (Ullah and Lai, 2013), fit, marriage, synchronization (Ullah and Lai, 2011), linkage (Ullah and Lai, 2013; Gartlan and Shanks, 2007), integration (Ullah and Lai, 2013), harmony (Olsen, et al., 2014) and bridge.

Alignment definitions: the process of alignment between businesses and information systems involves two key questions: how does the information system align with the business environment? and how does the business organizational environment align with the information system environment within the business organization? Therefore, alignment consists of two elementary concepts, namely business planning and information system planning (Silvius, 2007). There are various definitions of business and information system alignment in the existing literature but the most prominent ones that have been selected for the purpose of this research are shown in Table 2-1

Interestingly, alignment is often studied without a clear definition of the concept. Of the 80 alignment articles reviewed, more than one third (35%) do not define the idea of alignment at all; less than half (43%) explicitly define or conceptualize the process of alignment and the remaining articles (22%) refer to the work of other researchers in defining the alignment concept. This lack of definitional transparency represents a possible source of uncertainty, promoting diffusion rather than the convergence of viewpoints and obstructing the cumulative research evolution on alignment. Table 2-1

summarizes some of the well-cited definitions suggested for alignment and shows which manuscripts have adopted these definitions.

Table 2-1: Alignment definitions

| Originating Author(s), Year | Definition | Comments | Other Papers Citing the Definition |
|--|---|--|--|
| (Henderson and Venkatraman, 1999; Henderson and Venkatraman, 1992) | Alignment is the “degree of fit and integration among business strategy, IT strategy, business infrastructure, and IT infrastructure” | This definition discusses all factors of alignment, such as strategy, structure, social and cultural factors of the organizations and the fit between those factors. | (Das and Mishra, 2018; Gallotti, et al., 2017; Chopra and Singh, 2015; El-Masri, et al., 2015; El-Mekawy, et al., 2015; Chan and Reich, 2007; Gartlan and Shanks, 2007; Bleistein, et al., 2006, Chan, Sab, et al., 2006; Bleistein, et al., 2005). |
| (Smith and McKeen, 2003) | Alignment between business and IS is the “degree to which it is allowed, supported and motivated by information technology strategies”. | This definition addresses alignment between businesses and IS strategies. | (Høgevold, et al., 2019; Gbededo and Liyanage, 2018; Hinkelmann, et al., 2016; Gerow, et al., 2015; Herrmann, et al., 2008; Jaskiewicz and Klein, 2007; Guzman and Kaarst, 2004). |
| (Henderson and Venkatraman, 1999) | Strategic alignment of IS exists “when an organization’s goals and activities and the information systems that | Strategic alignment in the context of IS support in order to achieve organizational goals. The idea is similar to the previous definition of alignment. | (Høgevold, et al., 2019; Gbededo and Liyanage, 2018; Hinkelmann, et al., 2016; Kitsios and Kamariotou, 2016; Gerow, et al., 2015; Korhonen and Kaidalova, 2015; Ladib and Lakhali, 2015; Juiz, et al., 2012; Jorfi and Jorfi, 2011; Herrmann, et al., 2008; Jaskiewicz and Klein, 2007; Kearns and Sabherwal, 2006; Guzman and |

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| | support them remain in harmony”. | | Kaarst, 2004; Hirschheim and Sabherwal, 2001). |
| (Luftman, Lewis et al. 1993, Luftman and Brier 1999, Luftman, Papp et al. 1999) | Alignment is the process where “business and IT work together to reach a common business goal”. | Definition recommends fit between business and IS sectors, however, organizational factors are not clear in the definition. | (Shao, 2019; Rahrovani, et al., 2014; Ryu, et al., 2014; Salgado, et al., 2013; Silvius, et al., 2013; Siregar and Sembiring, 2013; Ullah and Lai, 2013; Ravishankar, et al., 2011; Ullah and Lai, 2011; Schniederjans and Cao, 2009; Silvius, 2007; Reich and Benbasat, 2000). |
| (Pollalis 2003; Venkatraman, et al., 1993) | Alignment is the “degree to which the mission, objectives, and plans contained in the business strategy are shared and supported by the IS strategy”. | Strategic fit in the context of IS support in order to attain organizational goals effectively. | (Shao, 2019; Rahrovani, et al., 2014; Ryu, et al., 2014; Salgado, et al., 2013; Silvius, et al., 2013; Siregar and Sembiring, 2013; Ullah and Lai, 2013; Ravishankar, et al., 2011; Ullah and Lai, 2011; Schniederjans and Cao, 2009; Silvius, 2007; Reich and Benbasat, 2000). |
| (Bleistein, et al., 2005; Venkatraman, et al., 1993) | Alignment is the “degree to which IS applications, IS infrastructure, business strategy and processes are enabled and shaped”. | This definition of alignment discusses the importance of IS applications in business strategy and infrastructure. | (Høgevoid, et al., 2019; Das and Mishra, 2018; Gbededo and Liyanage, 2018; Gallotti, et al., 2017; Chopra and Singh, 2015; El-Masri, et al., 2015; El-Mekawy, et al., 2015; Gerow, et al., 2015; Charoensuk, et al., 2014; Juiz, et al., 2012; Jorfi and Jorfi, 2011; Chan and Reich, 2007; Gartlan and Shanks, 2007; Jaskiewicz and Klein, 2007; Chan, et al., 2006) |

2.4.2. Analysis of alignment in relation to its directions

The literature shows that alignment between business and information systems can be studied from multiple viewpoints, including from the organization's strategic, structural, cultural and social contexts (Akter, et al., 2016; Ullah and Lai, 2013; Luftman and Brier, 1999; Reich and Benbasat, 1996). For this part of this research, we searched for articles in the context of the four contexts of alignment. We researched each context after further dividing them into four related keywords, as shown in Figures 2-5, 2-6, 2-7 and 2-8. After analyzing the 80 articles, we found that alignment was often studied in the context of organizational aspects, as shown in Figure 2-4. Of the 80 articles reviewed, almost half (49%) studied the strategic alignment between business and IS; 13% of the articles discussed the structural alignment between business and IS; 12% covered the social aspects of alignment, 12% of articles examined the cultural aspects of alignment with the remaining articles (14%) referring to the work on other aspects of organizational issues, such as system modeling in the context of alignment, requirement engineering and alignment, business goals and process modeling and so on. In this section, we briefly describe each of these alignment contexts.

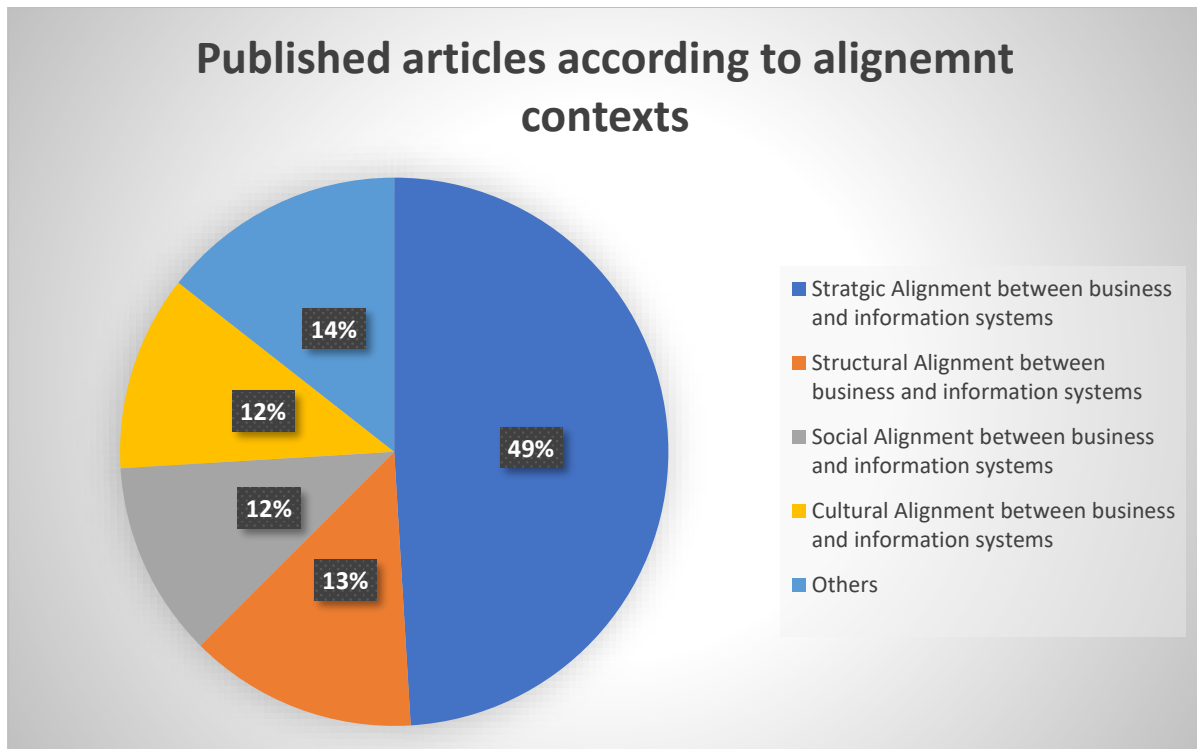


Figure 2-4: Alignment directions analysis

Strategic alignment: The concept of business strategy has been extensively studied in the areas of business and information systems alignment. According to Henderson and Venkatraman (1999), a business strategy has five components: first, a strategy is a plan which is employed to set guidelines to implement a proposed course of action; second, a strategy is a plan which is employed to respond to competition from others; thirdly, a strategy is a plan which denotes levels of action in business organizations; fourthly, a strategy is a position identifying ‘where’ and ‘when’ and needs to be applied to business actions, which could be both internal or external; and fifthly, a strategy is a viewpoint which denotes the differing viewpoints of managers when implementing the business model (Parry and Lind, 2016). Today, business organizations are deeply reliant on information system services to increase their business efficiency in almost all areas of the business organization and to do this, they spend a significant amount

of the company's budget on information system infrastructure. This part of organizational strategy justifies the IS investment and benefits for the proposed business organization (Bleistein, et al., 2005; Bergeron, et al., 2004; Peppard and Ward, 2004; Hirschheim and Sabherwal, 2001; Henderson and Venkatraman, 1999; Henderson and Venkatraman, 1992). Other parts of organizational strategy in the context of alignment are as follows: alignment of IS with business departments (Bleistein, et al., 2006; Chan, et al., 2006; Kearns and Sabherwal, 2006; Li, et al., 2006); strong working relationships between business and IS (Al-Majali and Md Dahalin, 2011; Jorfi and Jorfi 2011; Ravishankar, et al., 2011; Al Ghoson, 2010; Meijer and Thaens, 2010); and top-level alignment such as alignment between CEOs and CIOs (Das and Mishra, 2018; De Tuya, et al., 2017; Alkhuraiji, et al., 2016; Morgan, et al., 2016; Gerow, et al., 2015). Organizations frequently face rapid changes in the business environment, mainly in relation to changes in customer services, technologies and product life cycles. Rapid innovations and rigorous marketplace competition have forced business organizations to update their business strategies at a fast pace (Ullah and Lai, 2013; Schniederjans and Cao, 2009; Hsu, et al., 2009).

The selected articles on strategic alignment between business and information systems were carefully studied and have been added to the reference list. The percentage of articles on strategic alignment is shown in Figure 2-5 and their themes are listed in Table 2-2. Figure 2-4 shows the percentage of the selected papers according to the keywords studied in this alignment context.

Table 2-2: Studied common themes in alignment contexts

| Alignment context | Commonly studied themes | References |
|---|--|--|
| Strategic alignment between business and information systems | Connection between business and IT plan; strategic alignment; business and IT common strategy; IT strategy; business strategy; IS investment; business performance; Government strategy; IS resources; unclear strategies of business and IS; organizational rules; IS involvement in business strategy; IS leadership; suitable IS system; business and IS relationships; IS requirement engineering; IS usage. | (Shao, 2019; Das and Mishra, 2018; Volk and Zerfass, 2018; De Tuya, et al., 2017; Alkhuraiji, et al., 2016; Morgan, et al., 2016; Gerow, et al., 2015; Al-Majali and Md Dahalin, 2011; Jorfi and Jorfi, 2011; Ravishankar, et al., 2011; Al Ghoson, 2010; Meijer and Thaens, 2010; Schniederjans and Cao, 2009; Bleistein, et al., 2006; Chan, et al., 2006; Kearns and Sabherwal, 2006; Li, et al., 2006; Bleistein, et al., 2005; Bergeron, et al., 2004; Peppard and Ward, 2004; Hirschheim and Sabherwal 2001; Henderson and Venkatraman, 1999; Venkatraman, et al., 1993; Henderson and Venkatraman, 1992) |
| Structural alignment between business and information systems | Business and IS structure; complexity of organizational structure; centralized business units; lack of IS methodologies; formal business and IS structure; structural differences between business and IS; lack of IS support; importance of IS structure; eGovernment structure. | (Bisoyi and Li, 2019; Alkhuraiji, et al., 2016; Aslam, et al., 2016; Mirchandani and Lederer, 2014; Chung, et al., 2005; MacCallum, et al., 1996; Durand, et al., 1995; Cronbach, 1951) |
| Cultural alignment between business and information systems | Strong involvement of upper level management; well-managed working relationship; strong leadership; effective communication; business and IS planning at a lower level; communication gap; cultural relationship; IS in business decision making; belief in IS; communications maturity; governance; IS maturity; | (Zhang, et al., 2019; Volk and Zerfass, 2018; Odiit, et al., 2014; Rahrovani, et al., 2014; Silvius, et al., 2013; Ullah and Lai, 2013; Juiz, et al., 2012; Jaskiewicz and Klein, 2007) |

| | | |
|---|---|--|
| | government rules in cultural alignment. | |
| Social alignment between business and information systems | Shared domain knowledge; IS history; communication between business and IS executives; business and IS planning; maintaining IT belief in the business; long-term relationship; relationship between CEOs and CIOs. | (Høgevold, et al., 2019; Gbededo and Liyanage, 2018; Moon, et al., 2018; Gallotti, et al., 2017; Heaselgrave and Simmons, 2016; Korhonen and Kaidalova, 2015; Karahanna and Preston, 2013; Van Den Hooff and De Winter, 2011; Teddlie and Tashakkori, 2003; Reich and Benbasat, 2000) |

Structural alignment: it is expensive for any business organization to have many managerial personnel and administrative controls. Therefore, it is important to eliminate pointless managerial work within an enterprise (Rakgoale and Mentz, 2015; Jorfi and Jorfi, 2011). A business organization structure defines how organizations, departments, people and functions are linked and interrelate with each other in order to achieve common business goals (Bisoyi and Li, 2019; Alkhouraiji, et al., 2016; Aslam, et al., 2016; Mirchandani and Lederer, 2014; Chung, et al., 2005; MacCallum, et al., 1996; Durand, et al., 1995; Cronbach, 1951). Selecting the most appropriate structure is important and requires extensive planning, as not all kinds of structures are well-matched to all businesses or people (Rahrovani, et al., 2016; Ullah and Lai, 2013; Bergeron, et al., 2005). The selected articles on the structural alignment between business and information systems were studied and analyzed. The percentage of articles on structural alignment is shown in Figure 2-4. However, Figure

2-7 presents the percentage of selected papers according to the studied keywords in this alignment direction.



Figure 2-5: Strategic alignment according to factors

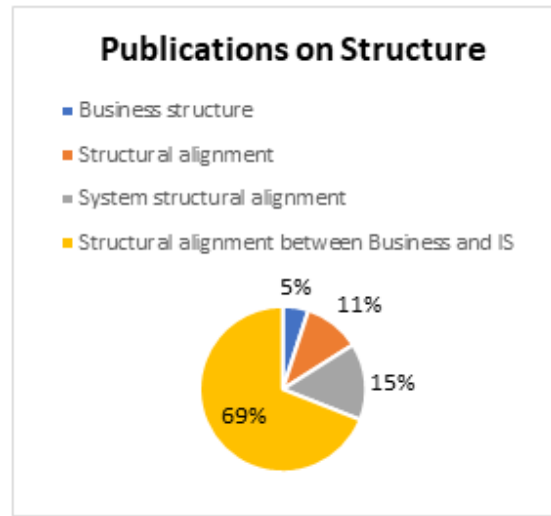


Figure 2-7: Structural alignment according to factors

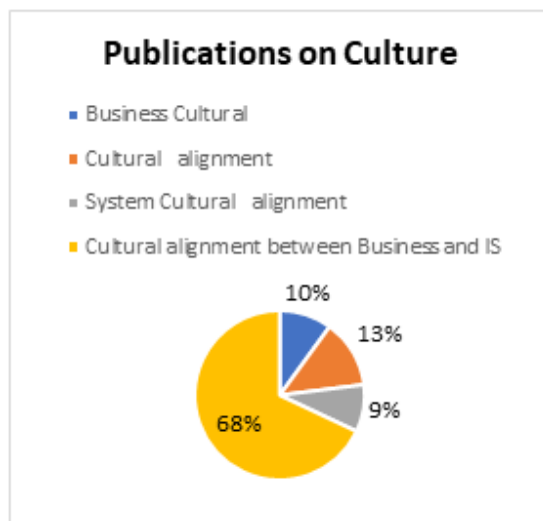


Figure 2-6: Cultural alignment according to factors

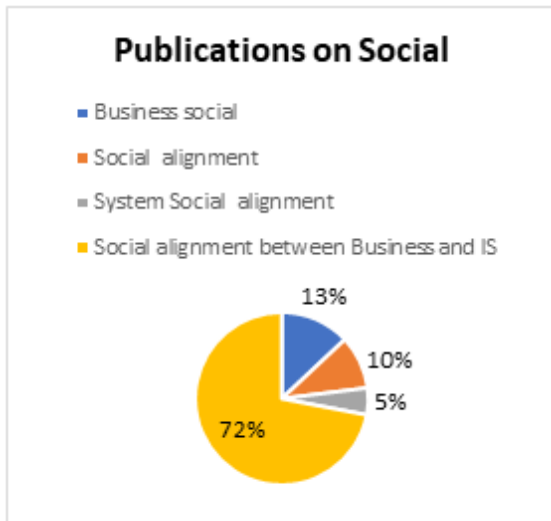


Figure 2-8: Social alignment according to factors

Cultural alignment: the notion of business culture became prevalent in the early 1980s and was derived from the early humanist associations' view of organizations that arose in the 1940s. Three key elements, beliefs, cross-cultural complexity and uncertainty (Ochieng, et al., 2013), shared values and behavioural norms, are required in order to ensure a strong organizational culture. Numerous methodologies relating to alignment from a cultural viewpoint have appeared in many previous studies (Shao, 2019; Friedman, et al., 2018; Heaselgrave and Simmons, 2016; Ravishankar, et al., 2011). These studies address the following organizational factors: strong involvement of senior management; well-managed working relationships; strong leadership; belief and effective communication between groups; connection between business and IT functions; cultural relationship at all phases of the business organization and informal business structure (Campbell, 2005). The selected articles on cultural alignment between business and information systems were studied and analyzed. The percentage of articles on cultural alignment is shown in Figure 2-6.

Social alignment: The social dimension of alignment in the business environment comprises several components, such as taxes, organizational lifestyles, and the standards that describe the society in which the business organization operates (Høgevold, et al., 2019; Gbededo and Liyanage, 2018; Moon, et al., 2018; Gallotti, et al., 2017; Heaselgrave and Simmons, 2016; Korhonen and Kaidalova, 2015; Karahanna and Preston, 2013). This dimension impacts on the ability of the business organization to gain resources, services, and functions that improve organizational performance (Hinkelmann, et al., 2016; Ullah and Lai, 2013; Jorfi and Jorfi, 2011; Van

den Hooff and de Winter, 2011; Reich and Benbasat, 1996). However, in the context of business and information system alignment, the social direction of the organization relates to the degree to which managers understand and are committed to the business and information system mission, together with the organization's objectives and strategic plans (Karjoth, 2015).

Numerous methodologies (Hinkelmann, et al., 2016; Ullah and Lai, 2013; Jorfi and Jorfi, 2011) relating to alignment from a social viewpoint have appeared in the literature, where researchers have addressed the following organizational factors: shared domain knowledge between business and IT executives; successful history of information systems; communication between business and information system executives; connection between business and information system planning; sharing knowledge between business and information system technicians and maintaining belief in the information system. The selected articles on social alignment between business and information systems were studied and analyzed. Figure 2-8 shows the percentage of selected papers according to the studied keywords in this alignment direction.

[2.4.3. Alignment models and analysis of alignment theories](#)

During this research process, we only found two articles (2%) that presented alignment models. In this section, only two models of alignment are discussed because these two models are the pioneers and all other models of alignment are based on these two. Although these two models are very old, all the existing models emanate from these two, which is the reason only these models are discussed in this section. Henderson and Venkatraman (1993) developed a model called the strategic alignment

model (SAM), which is the most widely accepted model in the field of business/IS alignment. The model is based on four different strategic domains, namely: strategy, organizational infrastructure and process, IS strategy and IS infrastructure and process, as shown in Figure 2-9. This model has received strong support from business and practitioners.

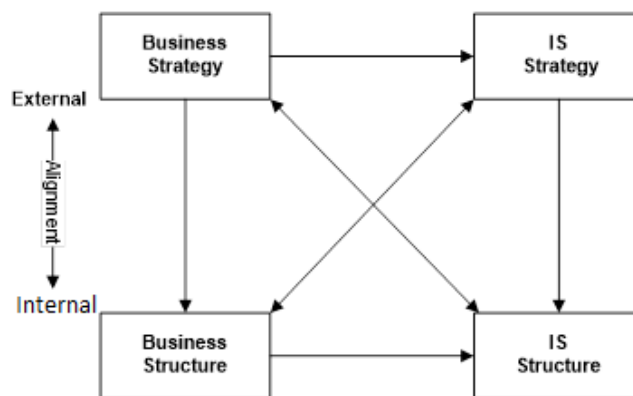


Figure 2-9: SAM (Henderson and Venkatraman 1999; Henderson and Venkatraman 1992)

Reich and Benbasat (1996) conducted work on the cultural and social issues of organizations and proposed an approach to measure the relationship between business and IS. As shown in Figure 2-10, four factors of social dimensions were considered: shared knowledge between business and technology executives; the success of technology within the business; communication and the connection between the business and the technology planning process. The selected alignment theories and models were analyzed in the context of their alignment measurement type and study theme, as shown in Table 2-3.

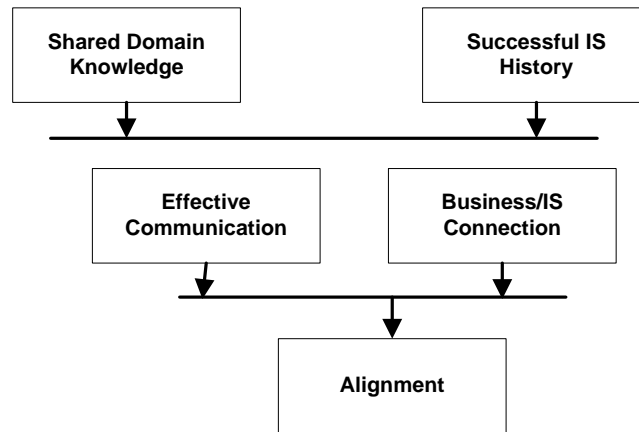


Figure 2-10: Cultural alignment model (Reich and Benbasat 2000; Reich and Benbasat 1996)

2.4.3. System modelling in the context of alignment and eGovernment

The term eGovernment refers to the use of information system (IS) services by government agencies that have the potential to transform relationships with industries, citizens and other arms of government (Ningsih, et al., 2013). IS technologies can serve a variety of purposes, such as better government services to citizens, enhanced interactions between government and business and better management of government administration. However, the process of managing and providing IS services to any government is a challenging task due to the rapid changes in the government environment and a lack of alignment between government administrations and IS departments (Ullah and Lai, 2013).

Table 2-3: Analysis of alignment theories and models

| Theory/Model | Alignment Measurement Type | Theme | References |
|--|-----------------------------------|-----------------------|--|
| Understanding the impact of business cases on IT investment decisions | Theoretical model | eGovernment | (Reich and Benbasat, 1996) |
| Alignment model using resource-based view method and COBIT | Case study approach | Business organization | (Siregar and Sembiring, 2013) |
| IT investment management framework of government institution | Empirically Proved | eGovernment | (Silvius, 2007) |
| Model of strategic alignment between business and IS | Empirically Proved | Business organization | (Henderson and Venkatraman, 1999; Venkatraman, et al., 1993; Henderson and Venkatraman, 1992) |
| Links IS plans and business plans; and business plans with information system plans. | Questionnaire approach | Business organization | (McAdam and McSorley, 2016) |
| Study of business goals in the context of system requirements engineering | Empirically proved | eGovernment | (Khan, 2016; Salgado, et al., 2013; Ullah and Lai, 2011; Zowghi and Jin, 2010; Cardoso, et al., 2009; Veres, et al., 2009; De la Vara González and Diaz, 2007; Bleistein, et al., 2006; Lehtola, et al., 2004) |
| Strategic use of new Internet technologies by governments | Configuration approach | eGovernment | (Garín-Muñoz, et al., 2019; Jones, 2012) |
| Connection between business strategy, business structure and IT strategy structure. | Questionnaire Approach | Business organization | (Bergeron, et al., 2004; Pollalis, 2003) |

| | | | |
|------------------------------------|--------------------|-----------------------|---|
| Outcomes of strategic IS alignment | Empirically Proved | Business organization | (Das and Mishra, 2018; De Tuya, et al., 2017; Gerow, et al., 2015; Al-Majali and Md Dahalin, 2011; Bleistein, et al., 2006; Chan, et al., 2006; Bleistein, et al., 2005; Bergeron, et al., 2004; Henderson and Venkatraman, 1999) |
| IT governance to fit each context | Case study | eGovernment | (Ghoshal, et al., 2003) |

One way of developing suitable systems and system processes according to government expectations is the derivation of IS requirements from the government's goals and objectives (Kantrow, 1980). In this study, we analyzed and categorized the previous studies into the following emerging main themes: goal modeling and IS requirements, linking business and IS strategies, business process management and lack of system support and business/IS long-term focus. Table 2-4 summarizes the selected methodologies within their main context.

In the context of goal modeling and IS requirements, Gartian and Shanks (2007), present an alignment framework which is based on the idea of business goal modeling and IS requirements and its outcome allows IS analysts to monitor the requirements at an early stage of IS development. Card et al. (1983) present their goal-based workflow and GOMS approaches and suggest a business goal and business process-based infrastructure for system requirements elicitation in regard to clarifying the IS and to understanding the current organizational circumstances. More recently, Ullah and Lai (2011) presented a business goal modeling approach using an IS requirements engineering approach. The aim of the approach is to help IS developers better understand organizational goals and their expectations of the required IS.

Table 2-4: Previous studies and approaches in the context of IS requirements and alignment

| Study themes | References |
|---|--|
| Goal modeling and IS requirements | (Khan, 2016; Salgado, et al., 2013; Ullah and Lai, 2011; Zowghi and Jin, 2010; Cardoso, et al., 2009; Veres, et al., 2009; De la Vara González and Diaz, 2007; Bleistein, et al., 2006; Bleistein, et al., 2005; Lehtola, et al., 2004) |
| Linking business and IS strategies | (Meijer and Thaens, 2010) |
| Business process management | (Berghout and Tan, 2013) |
| Lack of system support | (Siregar and Sembiring, 2013) |
| Business/IS long-term focus | (Ningsih et al., 2013) |

In relation to the context of linking business and IS strategies (Bleistein, et al., 2005; Bleistein, et al., 2006; Veres, et al., 2009) presented an IS requirements-based model called B-SCP that enables the verification and validation of system requirements in terms of alignment and support for organizational strategy. Veres et al. (2009) identify that one problem with the B-SCP model is that it is very complex to trace the dependency between IS requirements from the perspective of complex organizational projects. They extend the B-SCP model by describing an ontology data structure in order to represent the IS requirements and to establish the relationship between business and IS strategies. Zowghi and Jin (2010) developed a framework for identifying IS requirements, where the framework supports the systematic identification of IS requirements which include requirements elicitation and analysis (Bleistein, et al., 2006; John C Henderson and Venkatraman, 1992; Meijer and Thaens, 2010).

In the context of business process management, Arao et al. (2005) provide a business process-oriented requirement engineering model to understand the association between organizational processes and IS. The model defines three phases of requirements engineering: elicitation and business process verification, where they define the purpose of the organizational process; IS requirements elicitation and verification of detailed organizational processes, where they manage process-driven IS requirements using a scenario-based approach and IS elicitation and system specification, where they identify the IS requirements with the customer. Cardoso et al. (2009) proposed an organizational process-based model for system requirements and found that modeling organizational processes is a conventional practice in the system requirements field which facilitates problem comprehension (Broadbent and Weill, 1993).

Finally, in the context of a lack of system support and business/IS long-term focus, De la Vara Gonzalez and Diaz (2007) devised an IS requirements elicitation approach to improve business/IS alignment and expressed the belief that system requirements are the bridge between the organization and the system domains. Hermann et al. (2008) presented an approach known as SIKO where they define a method of system requirements derived from the business environment. Broadbent and Weill (1993) and Kaplan and Norton (1996) state that organizations today are moving quickly towards IS-oriented solutions in their businesses, especially the use of IS in business decision making (Chan, et al., 2006). Kappel (2001) and Lehtola et al. (2004) suggest in their methodologies that the most effective method of achieving long-term IS planning and alignment is to map system requirements with business planning (Ullah and Lai, 2011 ; Raup-Kounovsky, et al., 2010).

2.4.4. Definitions of eGovernment in the context of alignment

The term eGovernment can be defined from several perspectives such as the customer perspective, information system perspective, public perspective, local business perspective and interactions between all these stakeholders' perspectives (Almarabeh and AbuAli, 2010; Twizeyimana and Andersson, 2019; Bakunzibake et al, 2019; Yera et al. 2020). The literature shows that many researchers have defined the term eGovernment and most key definitions of eGovernment are summarized in Table 2-5.

However, it is important to agree on one definition, so for this research, we consider Yera et al.'s (2020) definition of eGovernment. This definition is attractive because it includes all the factors of alignment and eGovernment, such as: alignment between eGovernment and citizens, the importance of information systems to establish strong communication between eGovernment administration and the public and how eGovernment can satisfy the general public by using information systems effectively.

| Authors | Definition | Description |
|----------------------------|--|--|
| Almarabeh and AbuAli, 2010 | The term eGovernment refers to the use of technology related to information systems and communication among all the included stakeholders in relation to providing the public with the prospect of collaboration and doing business with their | The definition of eGovernment discussed important factors of eGovernment such as communication, information systems, the public and eGovernment. |

| | | |
|---------------------------------|---|---|
| | government via different media such as emails, blogs, via websites etc. | |
| Twizeyimana and Andersson, 2019 | This definition of eGovernment defines it as a strategy to improve business, citizens and intra-government communication with the help of information technology. | The definition shows the importance of information technology for the betterment of the relationship between eGovernment and other related stakeholders. |
| Bakunzibake et al., 2019 | eGovernment is the process of innovation with the establishment of collaboration between eDemocracy and eAdministration to meet public needs. | This definition of eGovernment shows the importance of the relationship between eGovernment users and government bodies |
| Yera et al. 2020 | The term eGovernment refers to a fast service to residents, local businesses, and society. | This definition of eGovernment focuses on the importance of information systems and the Government's use of technology to improve services for residents. |

Table 2-5: Definitions of eGovernment

2.4.5. Types of eGovernment

There are four types of eGovernment: government to citizen (G2C), government-to-business (G2B), government-to-government (G2G) and government-to-employees (G2E). A large body of research has been conducted on G2C eGovernment, which involves the establishment of strong communication relationships between eGovernment and its citizens. G2G eGovernment involves establishing strong communication relationships between all eGovernment departments and agencies. G2B eGovernment involves

establishing strong communication relationships between eGovernment and local businesses. G2E eGovernment involves establishing strong communication relationships between eGovernment and staff.

Figure 2-11 illustrates the difference between the four types of eGovernment. In this proposed research, as our focus is G2C, we propose an alignment framework for eGovernment departments in Saudi Arabia. The proposed framework will help the Saudi Arabian eGovernment sector to establish strong and reliable communication between the government body and the citizens of the country.

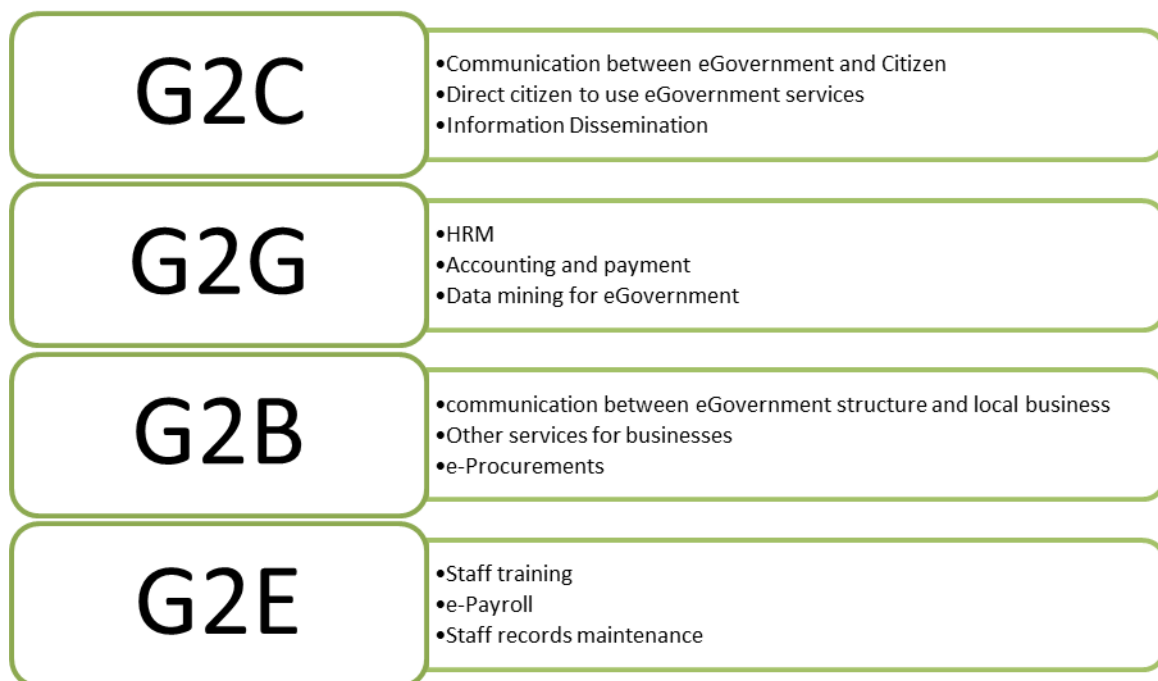


Figure 2-11: Types of eGovernment

2.5. Research gaps and future research directions

2.5.1 Research gaps

The literature indicates that eGovernment includes the use of information systems in delivering efficient and effective governmental services and policies to its citizens,

however this requires strong alignment between business and IS departments (López-López, et al., 2018). Numerous academics (Aloud, et al., 2018; Liu and Carter, 2018; Al-Hujran, et al., 2015; Bannister and Connolly, 2012; Al Ghoson, 2010; Cordella and Iannacci, 2010) in the area of eGovernment claim that the effective use of information technology and its acceptance by the government area can provide assistance to government agencies, businesses and citizens.

The term eGovernment incorporates the utilization of IS and ICT in order to provide the effective and efficient delivery of governmental policies and services to local businesses, people, and other agencies in the government (Aloud and Ibrahim, 2018; López-López, et al., 2018; Al-Nuaim, 2011; Al-Nuaim and Practices, 2011) . Several researchers (Aloud, et al., 2018; Liu and Carter, 2018; Al-Hujran, et al., 2015; Bannister and Connolly, 2012; Al Ghoson, 2010; Cordella and Iannacci, 2010) in the field of eGovernment argue that the successful use of information systems and its adoption by the government sector can provide likely benefits for local Government bodies.

Previous research techniques in this area only emphasise one or two of these aspects, that is, structural, strategic or cultural, in relation to the alignment of business and information systems, as shown in Table 2-6.

For example, Gong et al. (2008) measured business and IS strategy and found that strategic alignment can significantly influence business performance. Bergeron et al. (2004) examined the impact of alignment between business strategy and structure, and IS strategy and structure on business performance in 110 small and medium-

sized firms. Hirschheim and Sabherwal (2001) studied the evolution of information system alignment with business strategy and structure. Silvius et al. (2013) examined the cultural fit between business and IS and whether a cultural fit can influence the process of successful alignment and business performance in organizations. Luftman et al. (1999) empirically proves that achieving alignment is evolutionary and dynamic, requiring a strong cultural relationship among all the company staff in order to boost business performance.

Table 2-6: Related work

| Authors | Alignment fit between business and | | | | | | Alignment Aspect | Description | Domain |
|--------------------------------|------------------------------------|----------|----------|-------------|--------------|------------|------------------------|--|-----------------------------|
| | Business strategy | Business | Business | IS strategy | IS structure | IS culture | | | |
| Xiaoying et al. (2008) | √ | x | x | x | √ | x | Strategic + Cultural | The study measures business and IS strategy and finds that strategic alignment can significantly influence business performance | Local organizations |
| Bergeron et al. (2004) | √ | √ | x | √ | √ | x | Strategic + Structural | The study examines the impact of alignment between business strategy and structure, and IS strategy and structure on business performance in 110 small and medium-sized firms | International organizations |
| Hirschheim and Sabherwal, 2001 | √ | √ | x | √ | √ | x | Strategic + Structural | The study describes the evolution of information system alignment with business strategy and structure | Local organizations |
| Silvius et al. (2013) | x | x | √ | x | x | √ | Cultural | The study examines the cultural fit between business and IS and whether a cultural fit can influence the process of successful alignment and business performance in organizations | International organizations |
| Ullah and Lai, 2013 | x | √ | x | x | √ | x | Structural | The study results indicate that aligning IS infrastructure with business can positively affect organizational performance | Local organizations |
| Luftman et al. (1999) | x | x | √ | x | x | √ | Cultural | The study empirically proves that achieving alignment is evolutionary and dynamic, requiring a strong cultural relationship among all the company staff in order to boost business performance | Government |

However, there is a lack of information on the ideal pattern of alignment in the eGovernment sector, such as strategic alignment between business and IS, structural

alignment between business and IS, social alignment between business and IS and cultural alignment between business and IS.

Moreover, none of the studies provides a solution to alignment in the context of eGovernment. One way of ensuring robust alignment between IS and other government agencies is the implementation of information systems in agreement with government point of view to safeguard a system that meets the government's needs (Flores, et al., 2018; Abdullah, et al., 2006; Abanumy and Mayhew, 2005; Heeks, 2003). System requirements engineering is a technique to understand eGovernment requirements and which allows IS developers to develop system that fulfil the needs of government and helps to align eGovernment infrastructure (Algado, et al., 2013; Ullah and Lai, 2011; Zowghi and Jin, 2010; De la Vara González and Diaz, 2007). This thesis also provides a method of analyzing government processes with the aim of obtaining the system requirements, which helps to develop a suitable e-health system in the context of eGovernment.

2.5.2. Future research directions

The analysis of previous studies on alignment between business and IS clearly shows that several problems of alignment with respect to eGovernment exist. Furthermore, several authors agree that a successful alignment process results in many benefits to any organization, some of which are better business performance for the organization, effective strategic planning towards better IS support for the business, a stronger relationship between business and IS and bridging the communication gap at all levels of the business organization. However, achieving alignment is not a simple process but rather a complex and continuous one. Therefore, details of suggested future research directions are as follows:

1. Researchers in business/government IS alignment have increasingly come to view alignment as resulting from the alternatives that individuals choose within an ever rapidly changing business environment. If these alternatives or business choices can be identified, a practical next step in the field of business/eGovernment alignment is to identify the behaviours that herald them. This line of consideration agrees with the micro-foundation theory of management and information systems where analysis is performed at the behavioural strategy level to incorporate the actions of goal-seeking economic agents. The micro-foundation theory has been discussed previously; however, the concept remains controversial and subject to considerable academic debate. For example, to advance the micro-foundations concept, alignment researchers need to tackle the way that strategic alternatives/choices can be aggregated across actors and time to predict business performance.

2. Alignment is the degree to which the IS objectives, mission statement and plans are supported by the business organizational objectives, mission statement and plans. Evidence from the literature shows that the concept of alignment has been studied from various points of view in the context of alignment between business and IS. However, most researchers believe that business/IS alignment research has demonstrated that the issue of strategic differences between business and IS can be resolved using IS requirements techniques. Moreover, many researchers believe that further research is warranted to enhance our understanding of the multidimensional nature of strategic alignment

in contemporary organizations with more complex structural forms (Veres, et al., 2009).

3. The literature shows that researchers have studied alignment in different contexts, for example, the strategic, structural and cultural differences between business and information systems. Future research is needed to identify the comprehensive pattern of alignment which includes alignment between government strategy and IS strategy, alignment between government structure and IS structure, cultural alignment between government organizations and IS and social alignment between government organizations and IS.
4. Government organizations are constantly facing rapid changes in the business market, particularly in relation to changes in consumer services, technologies and product life cycles. In this context of rapid modernization and strong market competition, organizations need to change their business strategies and processes which are frequently improved and evaluated (Bleistein, et al., 2005).
5. Most of the existing alignment methodologies are business-driven rather than IS-driven. Therefore, technical experts often have difficulty in identifying business goals and objectives. Further research is needed on proposing an alignment solution from the IS side (Bleistein, et al., 2006).
6. The development of a successful IS in the context of alignment is not only necessary for the identification of IS requirements, the organization's activities must also be taken into consideration before commencing the development phase of the system, therefore organizational goal and process modelling is

required. Thus, further research is needed on business goal modelling in the context of alignment and better government performance.

2.6. Conceptual framework and discussion

As business organizations, goods, consumers and information systems change at a gradually increasing rate, senior management in business require overviews that will enable them to understand and analyze how every component within their business organization is aligned. Moreover, currently, many business organizations manage their business infrastructure without full awareness. For example, many businesses lack a clear understanding of organizational goals and objectives; of IS skills; of the tens of thousands of IS packages; IS servers; data elements; network devices and business processes that comprise their complex IS environment.

Therefore, without a clear understanding of the business environment, the outcome could be ineffective business planning, wasted IS resources and weak governance. Companies aim to achieve alignment between all the components that include the business and its environment. To establish or build strong alignment between business and IS, it requires the analysis of organizational problems and the management of change across all levels of the organization including IS. The required interface among business and IS viewpoints must be based on a clear understanding of the organizational requirements of information. Also, organizational solutions must integrate IS solutions so that business performance can be achieved through alignment between business and IS.

During the process of this research, we found that studying comprehensive alignment patterns as shown in our theoretical model in Figure 2-12 (i.e. strategic alignment,

structural alignment, cultural alignment and social alignment) in the eGovernment sector is important as the eGovernment sector of any country has several pillars, with each pillar being interlinked with each other. Evidence from the literature shows that even though there are a relatively large number of alignment methodologies which have been developed in the previous studies, most of these studies merely focus on general IS alignment with businesses while very few have focused on eGovernment information systems (i.e. eGovernment) alignment with respect to government organizations and administrations. Therefore, the framework for measuring and attaining alignment remains a serious issue for government organizations and most especially in developing economies.

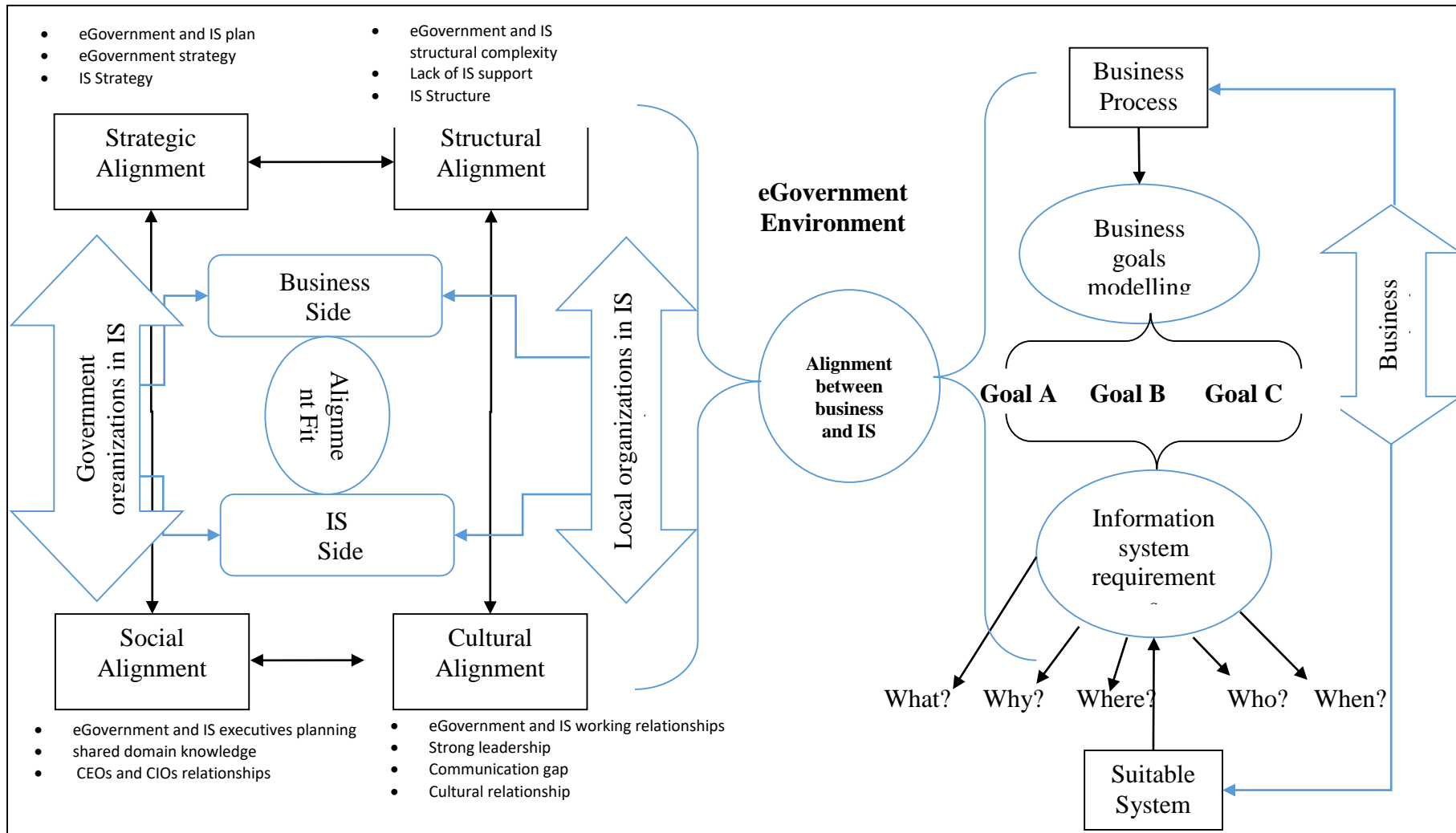


Figure 2-12: Proposed alignment framework (based on literature)

As a result of this problem, most eGovernment information systems have failed to yield appreciable and expected returns on investment due to the problems of a lack of alignment or effective synchronization between the government departments and the information system departments (Al-Khalifa, et al., 2017; Rose, et al., 2015; Alsenaidy and Ahmad, 2012; Alsenaidy, et al., 2012). Consequently, this raises many questions such as: how can government organizations better utilize their IS investments in order to achieve high business or organizational performance and grow productivity, raise annual revenue and improve viability? (Janssen and Shu, 2008; Gartner, 2007; Abdullah, et al., 2006; Abanumy and Mayhew, 2005; Heeks, 2003). Given the multifaceted nature of this question, previous investigators have failed to answer most of these questions with respect to government organizations, but rather suggested different alignment methodologies in the private sectors (Garín-Muñoz, et al., 2019; Corradini, et al., 2018; Flores, et al., 2018; Wirtz and Daiser, 2018; Al-Khalifa, et al., 2017). They argued that IS alignment has a positive influence on business organizational performance, if it is correctly matched with or fitted to their managerial, structural, social and cultural strategies (Haque and Khan, 2019; Haque, et al., 2019; Santa, et al., 2019; Ullah and Lai, 2011). Numerous existing alignment methodologies present distinct patterns for strategic, structural and cultural alignment between business and IS.

Only a small number of existing alignment methodologies present patterns for the alignment of two of these areas, for instance structural alignment between business and IS together with strategic alignment between business and IS (Ullah and Lai, 2011). However, the patterns for aligning one or two aspects of an organization are not enough for the comprehensive measurement of alignment between business and

information systems in the context of eGovernment and to recognize the impact of alignment on government performance. Therefore, a pattern for the alignment of business and IS in all four areas: strategic, structural, social and cultural, is of vital importance for any eGovernment sector (Khan, 2016; Bubenko, 2001).

As previously stated, IS technologies can serve a variety of purposes, such as better government services to citizens, enhanced interactions between government and business and the better management of government administration. However, the process of managing and providing IS services to any government is a challenging task, due to rapid changes in the government environment and a lack of alignment between government and IS departments. Strong alignment between IS and other government departments can ensure better administration and organizational performance in many ways, such as strategic, social, cultural and structural performance (Ullah and Lai, 2011). One way of developing a successful IS is to model the government's goals first, as one goal may have several sub-goals, as shown in Figure 2-11 and then derive the system requirements from these goals (Kappel, 2001).

The literature shows that business organizations can only perform better if they are aligned with their information system departments. This chapter presents research into alignment methodologies in the context of business performance and eGovernment (Garín-Muñoz, et al., 2019; Jones, 2012). It processes a framework of comprehensive alignment as shown in Figure 2-11 to comprehend alignment between business and IS means to study the four organizational components: Business and IS strategies, Business and IS structure, Business and IS social aspects

and Business and IS culture together and check the loadings of each alignment pattern on business performance. This can be done by studying these four alignment patterns quantitatively and qualitatively, so that we obtain the eGovernment expert's point of view as well as the point of view of the average users of eGovernment services.

Moreover, for comprehensive alignment, it is also important to develop a suitable IS which fulfils government requirements and improves eGovernment services effectively. This can be done by modelling the government business process and deriving IS requirements from the business process. The goal of system requirements engineering is to generate a comprehensive and consistent system requirement with the desire to create a developed system which fulfils business needs. This chapter is anticipated to be suitable for researchers considering conducting research in this area and business executives seeking to assess the detailed research on alignment between business and IS.

2.7. Summary

In this chapter, we analyzed, categorized and discussed the previous literature on alignment between businesses and IS research by exploring articles from relevant databases. Two main implications can be derived from this review. Firstly, for researchers who are interested in conducting research in the areas of government IS (i.e., eGovernment or public sector IS) alignment, this chapter presents directions and a detailed survey on alignment between business (i.e., the private sector) and IS. Therefore, the knowledge derived from business (the private sector) and IS could serve as foundational knowledge in the development of workable alignment models for eGovernment (the public sector) platforms. Secondly, for any organization (private or public), this study describes the significance of alignment for eGovernment success

and it also describes how CEOs and CIOs can measure and maintain alignment within their organizations.

In conclusion, after completing this detailed research, we first find that the alignment research community has made significant developments along many fronts. At the same time, the increasing challenges brought about by rapid changes from the organization's side, particularly changes in product life cycles and consumer services, has raised many new serious alignment research questions.

Secondly, alignment between business and IS has been studied into one (e.g. strategic alignment between business and IS) or two patterns (e.g. alignment between business and IS strategy, and alignment between business and IS structures) of alignment. However, another two key components of organization, cultural and social aspects, must be analyzed with strategy and structure in order to measure and control the comprehensive business organization structure.

A third point is that this research shows that alignment has been defined by several terms including alignment, fit, marriage, synchronization, linkage, integration, harmony and bridge. However, none of the articles in our literature review included the keywords of fit, marriage, synchronization, linkage, integration and harmony, except alignment. These keywords only refer to the word alignment, therefore, these keywords have not been searched during the literature review process of this research. Furthermore, alignment is a continuous process, where all organizational components must be aligned and work together to achieve common business goals. Alignment is not a single entity, where organizational structures can be fixed with the

press of a button to achieve their goals. Rather, alignment is a continual process which requires continuous improvement.

Finally, system requirements engineering and business process modeling are other ways to build strong alignment between business and IS. For example, alignment can be improved if IS teams are able to develop a system according to the business expectations or a system that fulfils business needs completely. This is possible by modeling a business process in order to derive complete and consistent system requirements.

The next chapter presents the context of this research, which is the eGovernment infrastructure in Saudi Arabia. Chapter 3 also describes several eGovernment projects and the role of alignment in providing suitable eGovernment services.

Chapter 3 The context of this research in relation to eGovernment projects and services in the Kingdom of Saudi Arabia

3.1. Introduction

In the previous chapter, a review of alignment between business and IS in the context of eGovernment was presented. This chapter examines the background of Saudi Arabia which includes its eGovernment projects and main features; demographic information; the climate; economy; culture and current eGovernment development from Saudi Arabia (Al-Sobhi, et al., 2009; Al-Fakhri, et al., 2008; Al-Saggaf, 2004). The literature indicates that across the globe, eGovernment services have been implemented (Almukhlifi, et al., 2018; Al Rajhi, et al., 2012; Alanezi, et al., 2012; Alshehri, et al., 2012; Alshehri, et al., 2010) and adopted by numerous governments to minimize costs through improvement in the accessibility, the quality, speed, efficiency and effectiveness of eGovernment services (De la Vara González and Díaz, 2007; Arao, et al., 2005; Lehtola, et al., 2004).

There is no common platform to implement eGovernment services and its infrastructure due to the fact that every government issue related to the management of the country is different. Therefore, eGovernment is usually designed and implemented in accordance with a country's social, cultural, economic and political features and unique requirements. However, these elements of a nation's features could hinder the design, implementation and adoption of eGovernment services, rather than facilitate the process of eGovernment adaptation (Kappel, 2001; J. Luftman, et al., 1999).

Once the research framework has been developed, it is important to discuss in which business sector or Government sector the proposed framework will be applied and evaluated. This study concerns Saudi Arabia therefore, it is essential to understand the eGovernment sector of Saudi Arabia in the context of the following information: the current situation in the sector, what is missing in the eGovernment sector of Saudi Arabia, why there is need to further improve the eGovernment sector in Saudi Arabia and is the implementation of eGovernment services in the country worth it.

By considering these points, the aim of this chapter is to present the background and the current situation in the Kingdom of Saudi Arabia with brief information about the importance of religion and the country's administrative structures. Moreover, information related to the features of the nation, including the country's demographic information, the climate, economy, culture and current eGovernment development in Saudi Arabia is also been presented. The country's unique features can either hinder or encourage the development of eGovernment services. The chapter also discusses the country's information technology plan and information technology programs related to eGovernment and aspects that are likely to encourage the development and implementation of eGovernment.

[3.2. Current situation in Saudi Arabia and the importance of eGovernment](#)

In Saudi Arabia, there are two vitally important features which are the holy memorials in the city of Makkah and Medina, and the country's significance as the birth place of Islam. The country hosts approximately two million Muslim pilgrims from across the globe every year. Muslims worldwide pray five times a day as this is the Muslim duty according to the Islamic faith. Praying five times a day is one of the key pillars of the

Islamic faith (Aloud and Ibrahim, 2018; Khoja and Sheeshah, 2018; Alanezi, et al., 2012; Al-Nuaim, 2011; Al-Nuaim and Practices, 2011; Al-Ghaith, et al., 2010). The country has a long history and in 1932, King Abdulaziz introduced a constitution for the country for the first time, which is based on the Alsharia laws and the holy book of Quran (Bleistein, et al., 2005; Luftman and Brier, 1999).

Saudi Arabia is ruled by a monarchy which began with King Abdulaziz bin Abdul Rahman bin Faisal. The present ruler is King Salman bin Abdulaziz, who became the Crown Prince in 2012 after the death of Nayef bin Abdulaziz and the King of Saudi Arabia on 23rd January 2015. The King of Saudi Arabia is formally known as the guardian or the manager of two mosques, which are located in Makkah and Medina city. According to Al Saggaf (2004), the spiritual importance of the Saudi nation strongly impacts on its social environment and the country's culture and has a direct influence on all fundamentals of life for its people (Ullah and Lai, 2011). The nation promotes its importance as the center of the Islamic religion to other Islamic countries across the globe.

Nevertheless, the nation's importance as the center of the Islamic religion requires that the Saudi Government and other related agencies have effective control of health services, accommodation, and transportation to fulfill the requirements of the large numbers of pilgrims who visit and perform Hajj every year at the same time (Coltman, et al., 2015; Ullah and Lai, 2011, 2013; Abdullah, et al., 2006). These procedural issues provided the early justification and importance for an eGovernment program to be designed and developed which would enable numerous Saudi Government departments to synchronize their eGovernment services during Hajj into a central data

warehouse (Al Rajhi, et al., 2012; Al Ghoson, 2010; Al-Fakhri, et al., 2008). This helps the Government to monitor and control the Hajj seasons centrally, which is not possible without strong alignment between information systems and other agencies in the eGovernment sector.

3.3. Country demographic information and demand for IS and alignment

The Central Department of Statistics in Saudi Arabia reported that the country's population in 2019 was approximately 33,554,343, of which about 19.9 million are Saudi nationals (73.7%) and about 11.3 million are non-Saudi nationals, as shown in Figure 3-1. The statistics also report on the gender balance, this being that 18.76 million are male and 14.33 million are female, as shown in Figure 3-2. This data also discloses that the population of Saudi Arabia has a high proportion of young people, with around 30.5 percent being under 18 years of age and 1.5 percent of the population being over the age of 65 years, with the maximum range of the population being between 15 years and 64 years old (Aloud, et al., 2018; Al-Ghaith, et al., 2010; Al-Saggaf, 2004). Moreover, the gender percentage indicate that the use of IS among young women in Saudi Arabia is increasing day by day, which means they can undertake many official activities from home rather than going out with a male.

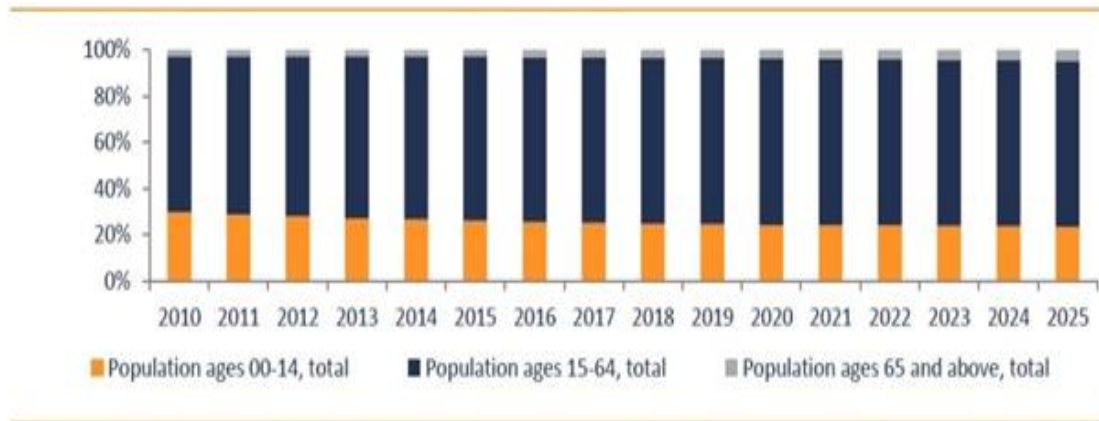


Figure 3-1: World Bank

As shown in Figure 3-1, the average age of the population in Saudi Arabia is 23 years, and 56.69% are males and 43.31% are females. As a result of this very high percentage of young generation the country, this means there is a higher probability that the revolution of the Saudi nation therefore, the development and implementation of information systems and computer science services will be supported (Alsenaidy, et al., 2012; Abdullah, et al., 2006; Al-Saggaf, 2004).



Figure 3-2: Gender percentage and IS services demand in the country (Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008)

This is because the younger generation in the country has a better ability to learn new and innovative information systems and information technology related skills and will welcome these technological-related services compared to older generations. Shelley et al. (2004) conducted an empirical evaluation of the importance of eGovernment

among the young generation and their research findings indicate that young adults who have a degree in higher education and work in technological fields are more likely to support and use the eGovernment which are currently provided (Al Rajhi, et al., 2012; Basri, 2012; Alsenaidy, et al., 2012; Al Ghoson, 2010; Al-Saggaf, 2004).

3.4. IS alignment and the climate of the country

According to the World Fact Book (2011), the climate in Saudi Arabia is mild during the winter season, however, around 9 months of the year, the climate is dry and very harsh with daytime temperatures around 49°C, as shown in Figure 3-3 (Al-Khalifa, et al., 2017; Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008). This temperature might be a factor that motivates the acceptance of eGovernment services, as people might be motivated to use eGovernment products and services from home so that they do not have to visit Government facilities during the hot weather (Al-Khalifa, et al., 2017; Al-Nuaim and Practices, 2011; Al-Ghaith et al., 2010).

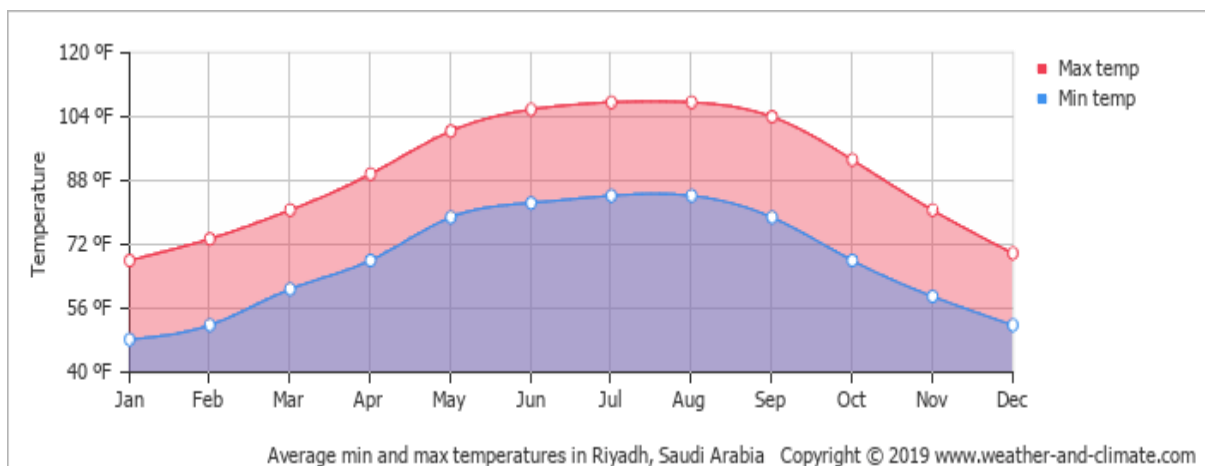


Figure 3-3: Saudi Climate (Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008)

About 80% of the population in Saudi Arabia lives in urban areas, which is a strong factor for accepting and adopting eGovernment products and services. This is

because in urban areas, people are more likely to use the Internet and other related services compared to people living in the countryside. Therefore, people living in urban areas are enthusiastic users of eGovernment services, as these services make their life easier and more convenient in a hot climate (Aloud, et al., 2018; Al-Ghaith, et al., 2010).

3.5. eGovernment projects and Saudi economy

The Saudi Arabian economy mainly depends on its income from oil, which represents 88 percent of export earnings, 80 percent of budget incomes and 46 percent of gross domestic product (GDP). According to the World Fact Book (2011), Saudi Arabia is currently ranked the prime producer and exporter of oil across the globe and presently holds about 25 percent of oil reserves worldwide (Aloud, et al., 2018; Al-Khalifa, et al., 2017; Al-Saggaf, 2004; Shelley, et al., 2004). The additional growth of the petrochemical trade has increased the country's income with oil-associated merchandise, for example metal, gas, iron and copper. Most engineering activities are managed and controlled by the Government of Saudi Arabia, however, the private sector has been supported and encouraged by the Saudi Government to invest in the country (Al-Saggaf, 2004; Shelley, et al., 2004; Alsenaidy, et al., 2012). In this way, the capacity and capability for employment might be increased, and income expanded. Moreover, Saudi Arabia has used its robust economy to invest in different areas such as municipal services, transport and communication, water and infrastructure, health and social affairs, and education and manpower, as shown in Figure 3-4. This investment from the Saudi Government could contribute to the design, development and adoption of eGovernment products and services.

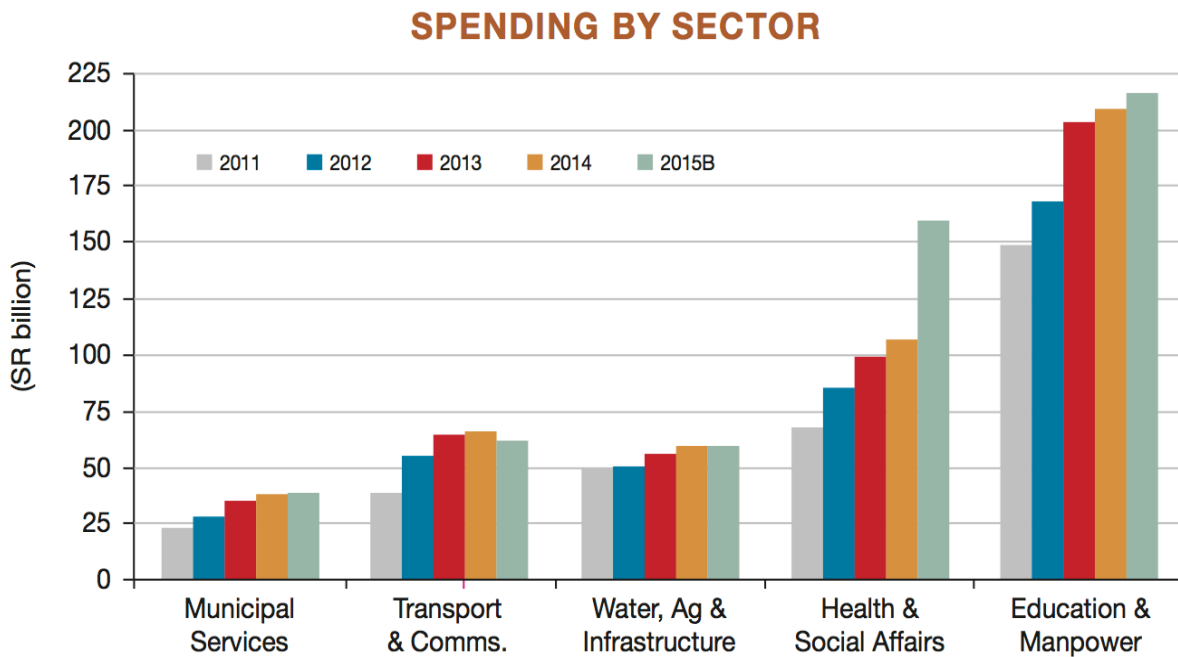


Figure 3-4: The Saudi economy by sector (Alsenaidy, et al., 2012)

The Government also supports projects that bring innovation, and improve IS skills and training, and build an infrastructure that is capable of supporting the adoption of hardware and software. This investment by the Government increases the possibility that its eGovernment services will be accepted by the nation.

3.6. Saudi culture and its influence on eGovernment services

The cultural background of Saudi Arabia is significantly predisposed by the Islamic and Arab culture. The country's civilization is in general extremely spiritual, old-fashioned, conservative and is based on established family values. Numerous traditions and attitudes are 100,000 years old and are based on Islamic heritage and the Arab civilization (Haque and Khan 2019; Al-Khalifa, et al., 2017; Alsenaidy, et al., 2012; Al Ghoson 2010; Abdullah, et al., 2006; Abanumy and Mayhew 2005).

However, over the past few years, Saudi culture has also been influenced by rapid change, for example, giving permission to women to watch games with males and

allowing women to drive cars. According to Al Saggaf (2004), the Muslim lifestyle is based on Islamic rules and regulations, therefore, this is not only a spiritual ideology (Alsenaidy, et al., 2012). When the principles of Islam are applied, people are encouraged to choose suitable options for cultivating their lives, upholding their duties and appreciating others, as this helps to advance and further develop the society (Alsenaidy, et al., 2012; Alshehri, et al., 2012). Though Islam encourages gender isolation in certain cases due to privacy and safety concerns, a Islamic group endorsed the segregation of genders.

Thus, Saudi culture dictates that the genders are separated, therefore, in most cases females and males cannot work in the same place. This is the situation in government offices where women are not allowed to work with men, and they are highly dependent on their male relatives such as fathers, brothers and husbands (Alshehri, et al., 2012; Alsheha, et al., 2007; Magd, 2006). In Saudi Arabia, women are not encouraged to drive cars and they have to rely on their male relatives for transport. This could encourage the female population to use eGovernment services via the Internet, which may be more convenient than visiting government departments in person. Moreover, Saudi Arabian culture frequently exercises favoritism and unfairness, which is due to the nation's ethnic system (Alsenaidy, et al., 2012; Alshehri, et al., 2012; Alsheha, et al., 2007; Shelley, et al., 2004). In this context, eGovernment services could be perceived as a way to minimize corruption inside the government sector and guarantee that a transparent justice system is applied across the whole Saudi community.

The government of Saudi Arabia has acknowledged the significance of engaging expert advisers from various developed nations in order to improve the eGovernment infrastructure and to train Saudis in using eGovernment services (Alshehri, et al., 2010; Al-Sobhi, et al., 2009; Magd, 2006; Al-Saggaf, 2004; Shelley, et al., 2004). However, the implementation and acceptance of the information technology service from developed countries might expose issues within this spiritual, ethnic and traditional civilization. In Saudi Arabia, it is important for the government to consider all these cultural issues before developing eGovernment services, therefore, expertise from developed countries and advanced technology needs to be better affiliated with the country's culture (Alshehri, et al., 2010; Al-Sobhi, et al., 2009; Al-Saggaf, 2004). This could improve eGovernment services and the adoption rates of eGovernment services may increase.

In this context, the motivational factors behind the Saudi government's design and implementation of eGovernment systems comprise the following (Alshehri, et al., 2012; Alsheha, et al., 2007; Gartner, 2007; Al-Saggaf, 2004):

- zero taxes in the development of information technology and the information systems business;
- a significant portion of the budget is allocated to eGovernment services and it is indicated that there are numerous opportunities for technological business in the country;
- senior administration in the country appreciates and supports the eGovernment concept and services;

- the female population in the country can access eGovernment services from home;
- the percentage of young people is high and they support eGovernment services and are willing to learn new skills and procedures;
- eGovernment services could minimize operational costs and improve the public's overall lifestyle;
- eGovernment is a time-saving solution for people who have busy, modern lives;
- eGovernment services can standardize the government's infrastructure, which could lead to a decrease in corruption through the use of an effective monitoring system.

In contrast, the design, development and support for eGovernment services might be delayed due to numerous obstacles relating to cultural and technological issues in the country (Alshehri, et al., 2010; Al-Sobhi, et al., 2009; Gartner, 2007; Al-Saggaf, 2004). The distribution of eGovernment products and services might be hindered through a number of technical aspects, for example, safe and secure eGovernment services, business process reengineering, a fast and reliable network in the country and a modern and advanced unified structure is lacking in the large and populated areas in the country (Alshehri, et al., 2012; Alshehri, et al., 2010; Al-Sobhi, et al., 2009; Alsheha, et al., 2007). In this context, researchers have studied and evaluated 21 websites that offer eGovernment services on behalf of the Saudi Government. The author found that nine websites do not introduce or offer any eGovernment services or features and rest of the websites have only partially implemented eGovernment services and a substantial amount of further work is required to make the services faster and more reliable (Gartner, 2007). However, many eGovernment features have

still not been implemented or offered in the country. Figure 3-5 presents the common features of an eGovernment.



Figure 3-5: Common eGovernment services (Gartner, 2007)

The design and implementation of eGovernment features in the country might also be problematic due to different organizational factors, for example: a lack of IS skills; a lack of government support; non-alignment between IS and other agencies in the eGovernment sector; insufficient eService rules and regulations; non-alignment between public and private firms; a lack of IS training and support and inadequate awareness of eGovernment products and services from the government (Haque, et al., 2019; Gartner, 2007; Magd, 2006).

Moreover, many researchers found that there is no common mechanism or framework to implement and design eGovernment services in any country. Therefore, it is important for a government to consider the cultural issues before the implementation of eGovernment services and adhere to the principle of avoiding clashes with opinions and practices from a cultural perspective. Saudi Arabia is in the early stage of eGovernment development and the government is facing many challenges from cultural and social perspectives (Haque, et al., 2019; Santa, et al., 2019; Gartner, 2007). Consequently, the government in Saudi Arabia is currently identifying and considering the factors affecting the development of eGovernment products and services including social and cultural aspects.

[3.7. eGovernment projects in Saudi Arabia](#)

The Saudi Arabian government recently announced a huge budget for information systems and information technology projects under the slogan of “make the country smart”. However, the country’s top management wants to make sure that all IS projects align with the country’s needs. This raises the question as to how IS developers can make sure that the system meets the needs of the country and why there is a need for alignment between business and IS? To answer these questions, it is important to discuss all important IS projects which are currently running in the country and their limitations.

[3.7.1. The Yesser eGovernment program](#)

In Saudi Arabia, the selection and employment of suitable security management and controls for information technology and information systems are vital steps that might have key consequences on the processes, procedures and resources of any

government activity as well as the advantages for citizens (Santa, et al., 2019; Al-Nuaim, 2011; Al-Ghaith, et al., 2010). Safety management and controls are the effective and methodical safeguards prearranged for eGovernment products and services to defend the privacy, accessibility and integrity of government information and systems (Santa, et al., 2019; Haque, et al., 2019; Gartner, 2007; Magd, 2006). However, the challenge for the Saudi government is to regulate a suitable type of safety control, what if designed, developed and determined to be operative in their applications would be very cost effective in accordance with safety requirements.

Moreover, the movement of the Saudi civic sector into the information age has been largely due to the nation's decision to develop and introduce eGovernment. Therefore, the services provided by the Saudi Government have been expanded, the efficiency of these IS products have been improved and the effectiveness of eGovernment services has been enhanced, all of which contribute to the economic growth of the country (Santa, et al., 2019; Aloud, et al., 2018; Magd, 2006). The Yesser program was introduced by the Saudi government in 2005 and aims to simplify the design and implementation of eGovernment plans into management sectors. The key objectives of the Yesser program are summarized in Figure 3-6. As a result of the Yesser program, Saudi Arabia embraced the eGovernment initiative which comprised the following ten eGovernment objectives: provide world class eGovernment services to the public, provide eGovernment services which are easy for the public to use, ensure the public can utilize eGovernment services 24/7, motivate people to use eGovernment services, win public trust in Government services, deliver all Government services electronically, share and store information which is easy to manipulate and help the country to use its resources effectively. Gartner (2007)

reported that other urban countries like UAE, Bahrain and Jordan are far ahead of Saudi Arabia, the main reason for this being that the Saudi Government was late to realize the benefits of eGovernment (Al-Saggaf, 2004). However, the author mentioned that the Saudi Government has made substantial progress since they started working on the implementation of eGovernment.

| | |
|---|---|
| <p>Description</p> <ul style="list-style-type: none"> Objectives for the e-government initiative can be defined which should contain measurable criteria for success They can represent a mix of government agency internal, user related and other objectives, e.g., national This will guide the monitoring of the implementation | <p align="center">10 OBJECTIVES OF THE SAUDI ARABIA'S E-GOVERNMENT INITIATIVE</p> <p align="center">PROVIDE BETTER SERVICES BY THE END OF 2010</p> <ol style="list-style-type: none"> 1. Provide the top priority services (150) at world class level of quality electronically 2. Deliver services in a seamless and user friendly way and at highest standards of security 3. Make services available to everyone in the Kingdom and allow 24/7 access from cities as well as countryside and even outside the country 4. Realise 75% adoption rate with respect to the number of users 5. Ensure 80% user satisfaction rating for all services provided electronically <p align="center">INCREASE INTERNAL EFFICIENCY AND EFFECTIVENESS</p> <ol style="list-style-type: none"> 6. Deliver all possible official intra-governmental communication in a paperless way 7. Ensure accessibility of all information needed across government agencies and storage of information with as little redundancy as possible 8. Purchase all goods and services above a reasonable value threshold through e-procurement <p align="center">CONTRIBUTE TO COUNTRY'S PROSPERITY</p> <ol style="list-style-type: none"> 9. Contribute to establishment of information society in the Kingdom through spreading information, knowledge and use of e-services 10. Help improve use of country's assets and resources by increasing society's productivity in private, business and public sector |
|---|---|

Figure 3-6: The Yesser program objectives (Al-Nuaim and Practices, 2011)

The Yesser program is administered by two ministries: the Ministry of Finance and the Ministry of Communication and Information Technology (Aloud, et al., 2018; Al-Nuaim and Practices, 2011; Al-Saggaf, 2004). In 2010, the budget for the Yesser program was increased from 1.5 billion to 2.2 billion dollars and the objectives of this project were updated. The following new objectives were included in the program: training in

eGovernment services; transforming paper-based information to digital; minimizing spending on public sectors; improving the quality and reliability of government services. The Saudi Government also identified the eGovernment project values as shown in Figure 3-7. Therefore, the government of Saudi Arabia understood the value of the eGovernment infrastructure to the country, which include: better control of Governmental departments by the top management, top management can easily evaluate the progress of different departments through eGovernment products of services, easy for the Government to align all the related departments so that utilization of resources can be controlled, eGovernment services can help the government to deliver services on time to the public and it helps to collect data from different departments and services, which can be used later to identify future research directions.

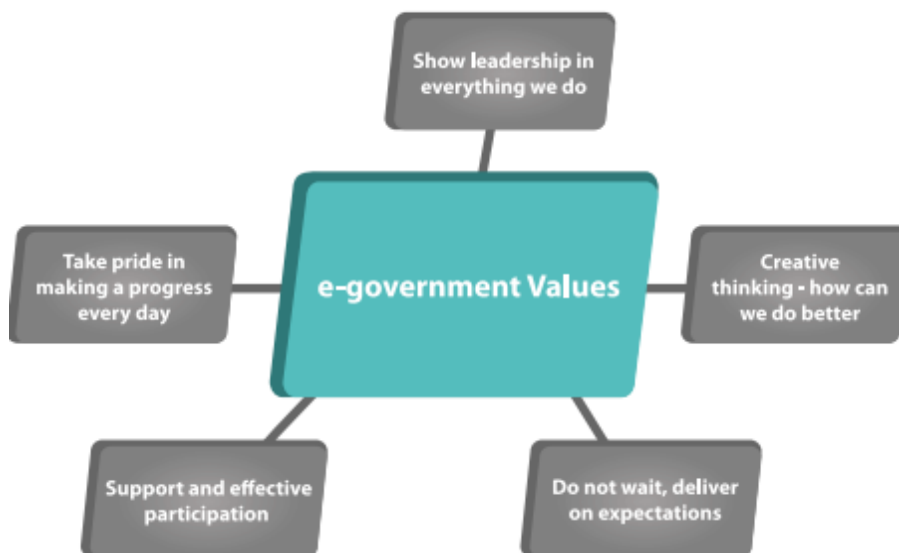


Figure 3-7: eGovernment values for Saudi Government (Al Rajhi, et al., 2012)

To implement this project, two action plans were employed. The first action plan extended the maximum period of 2 years, for the trial of eGovernment products and services. In this action plan, the Government quickly prioritized the project's results, identified the project cost and found ways to reduce the project development cost (Al Rajhi, et al., 2012). The second action plan allocated five years to devise the rules and regulations of this project. The second action plan includes the government vision, strategic themes, project objectives and work streams, as shown in Figure 3-8. Hence, the Yesser program had many different components in relation to eGovernment services. In this action plan the government of Saudi Arabia introduced an eGovernment vision, in which everyone is able to use government services at anytime from anywhere without any fear of a security breach. The program is divided into three components: 1) sustainable eGovernment workforce to ensure reduced costs for accessing government services, 2) government efficiency to provide secure and quality services to the public, 3) public interaction experiences to increase customers' awareness of the general public.

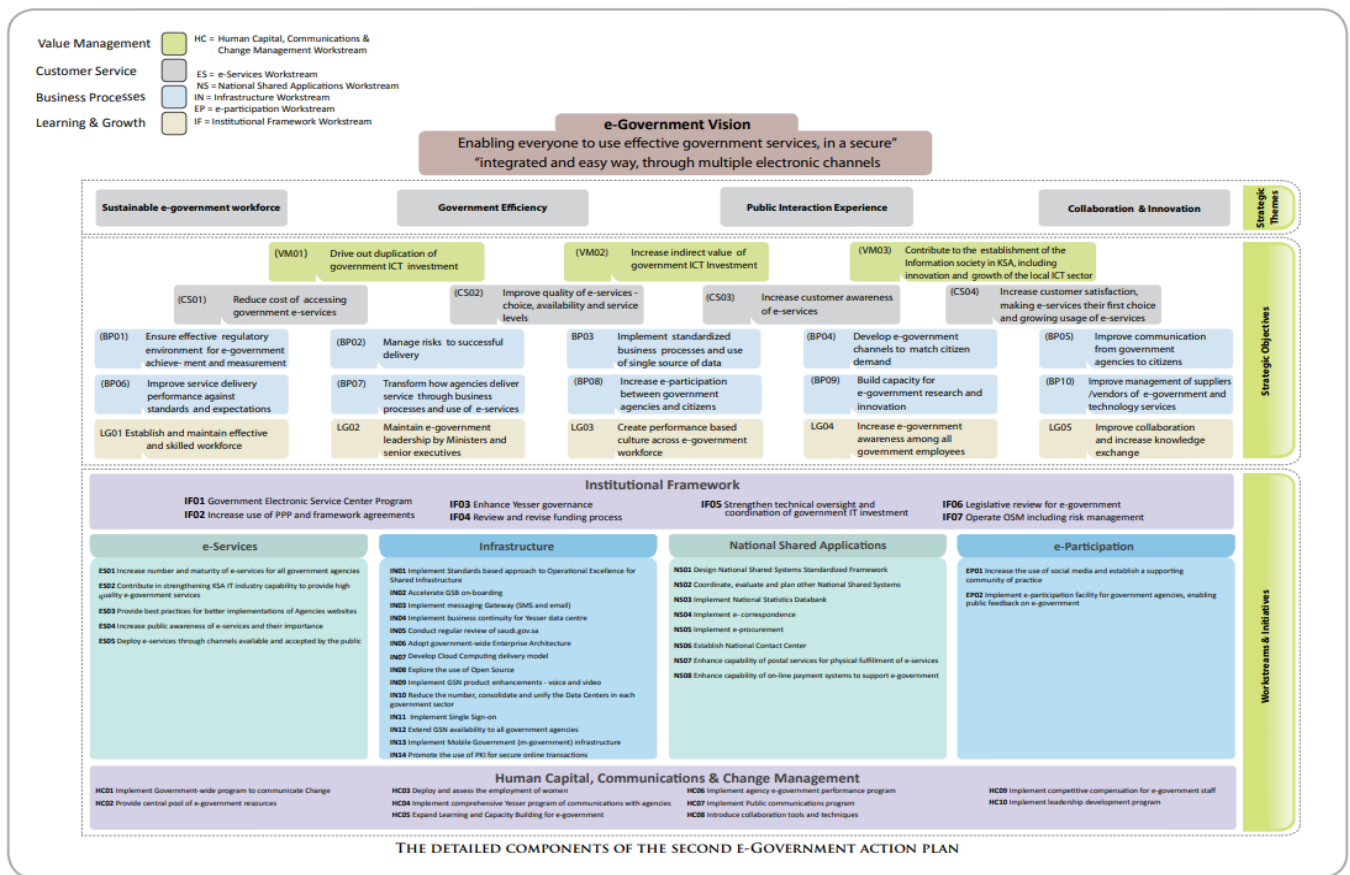


Figure 3-8: Second Action plan of the Yesser Program (Aloud, et al., 2018; Al-Saggaf, 2004)

The second action plan focused on people who use eGovernment services with the following three objectives: contributing to the success of the nation, increased efficiency and productivity of Government sectors and improved public health services by the end of 2020. This objective was further divided into ten sub-objectives as shown in Figure 3-8. The Saudi government’s objective for this eGovernment project was to increase opportunities in a shorter period of time which may influence the current and future state of eGovernment service design and development (Aloud, et al., 2018; Al Rajhi, et al., 2012; Al-Saggaf, 2004). The Yesser project failed to follow the fundamental requirements of the guidelines and government concerns, for example copyright, documentation policies and the Information Act.

For the success of any eGovernment project, it is important to understand the various government factors which need to be addressed (Aloud, et al., 2018; Al-Ghaith, et al., 2010). For example, there is a need for a clear and concise project strategy and vision and the project management team should make sure that the public are the center of the project and that all eGovernment services become more efficient. For this, the government of Saudi Arabia required increased efficiency and productivity from all departments and government agencies require substantial cross-departmental software services and a satisfactory and reliable structure. The Saudi Arabian eGovernment framework, which is implemented in four phases, is presented in Figure 3-9. In phase 1, the current state of eGovernment services is analyzed; in phase 2, new ideas are integrated into the existing business processes; in phase 3, security in eGovernment is introduced; and in phase 4, the progress of eGovernment services is evaluated.

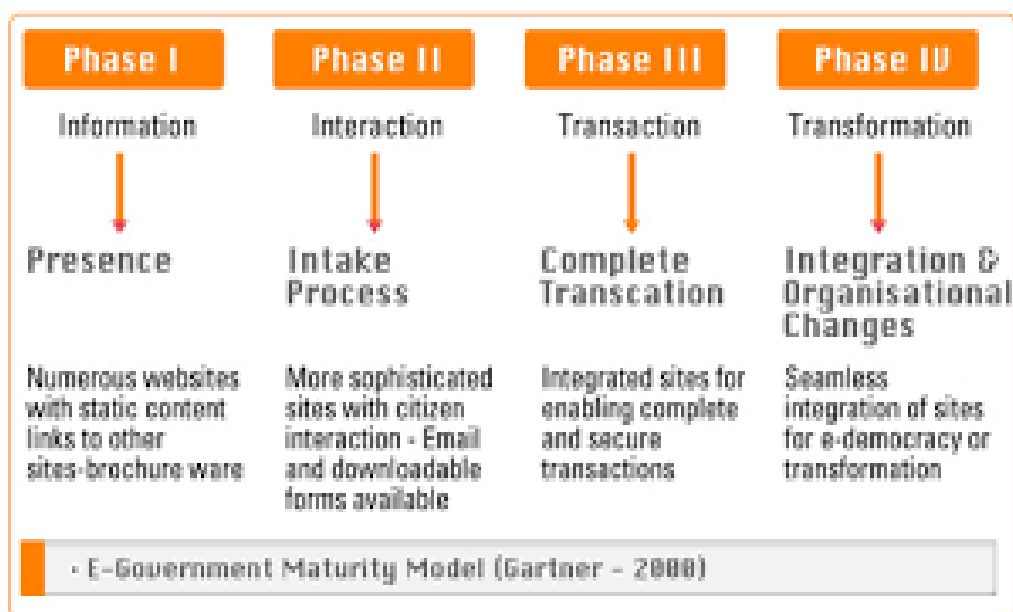


Figure 3-9: eGovernment phases in Saudi Arabia (Al-Saggaf, 2004)

The Yesser program was evaluated and measured by the Gartner Group in 2007 (Alshehri, et al., 2012; Alsheha, et al., 2007; Gartner, 2007). The group divided the eGovernment process into four phases. Phase 1 is the information phase, in which the government's numerous websites with static content links to other websites were identified. Phase 2 is the integration phase, where more sophisticated websites with citizen integration-email and downloadable forms were made available. Phase 3 is the transaction phase, in which integrated websites were created to enable complete and secure transactions. Finally, phase 4 is the transformation phase, involving the seamless integration of websites for a better communication (Haque, et al., 2019; Al Rajhi, et al., 2012; Gartner, 2007).

[3.7.2. Saudi national initiatives towards eGovernment services](#)

In Saudi Arabia, in 1962, the first computer was used in government departments to perform government tasks electronically, for example printing and data analysis. From 1962 to the 1970s, the government of Saudi Arabia encouraged all departments and agencies in the sector to implement and adopt information technology services and products (Haque, et al., 2019; Al Rajhi, et al., 2012; Alshehri, et al., 2010; Gartner, 2007).

However, in the private sector, the use of information technology was very different to the public sector, as private firms in Saudi Arabia rapidly applied advanced technology

in their business processes and applications (Haque, et al., 2019; Alanezi, et al., 2012; Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008). For example, the Aramco company which is one of the top companies in Saudi Arabia, the petrochemical company SABIC, the Saudi Telecommunication Company and the banking sector all used the same information technology services and products as firms in developed countries (Aloud, et al., 2018; Al-Khalifa, et al., 2017; Alanezi, et al., 2012; Gartner, 2007). One of the survey results indicates that about 90 percent of private organizations are using advanced and up-to-date technologies. Therefore, the government of Saudi Arabia launched the Yesser program, which introduced information technology to all levels and departments in the government structure. All these developments are defined within the term eGovernment.

[3.7.3. Saudi Arabia portal for eGovernment](#)

The development and integration of eGovernment products and services is called the eGovernment portal. The key aims of this portal are to permit citizens of Saudi Arabia, small and large business, and government departments and other related agencies to gain benefits from this portal, which allow them to connect with eGovernment services from anywhere and at any time (Aloud, et al., 2018; Al-Khalifa, et al., 2017; Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008). The portal is integrated within numerous government departments and agencies through responsive websites.

This portal also allows all stakeholders in Saudi Arabia to understand and guide the state rules and regulations and other related information about the Kingdom of Saudi

Arabia, such as the history of the country, the latest news, a calendar showing the latest events.

3.7.4. eGovernment project for granting Umrah Visa

Muslims perform Umrah in Saudi Arabia and during Umrah, they visit the holy mosques of Makkah and Madinah, which are located in the two largest cities in the country. Every year Muslims visit Saudi Arabia from all over the world for Umrah and people from other countries are required to have a visa. However, the large volume of visa applications results in four to five months' delay (Alsenaidy, et al., 2012; Alshehri, et al., 2012; Gartner, 2007; Al-Saggaf, 2004).

To minimize this delay, a portal called e-Umrah has been introduced. Under this portal, the Foreign Affairs and Interior Ministries in Saudi Arabia are able to speed up the visa process and visas can now be granted within 24 hours. This is because an electronic procedure of evaluating visa applications has replaced the old and traditional method, which required departments to send and share paperwork between the governments of different countries through the post which was time-consuming. Now, everything is done via the electronic portal and governments share documents electronically, which is a fast, secure and reliable process compared to the traditional process (Alsenaidy, et al., 2012; Alshehri, et al., 2012; Gartner, 2007; Al-Saggaf, 2004).

3.7.5. Smart identification of Saudi Nationals

Under this project, the government of Saudi Arabia planned to provide the public with a smart card to replace the national ID card of Saudi Arabia. This card holds all the

important information of a Saudi national such as personal information, medical records, driving license, and thumbprints in one computerized chip (Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008).

This program has been expanded further and now includes information on the cardholder's health, private insurance and digital certificates (Al-Khalifa, et al., 2017; Alsheha, et al., 2007). This smart card enables citizens of Saudi Arabia to travel to other Arab countries without an official passport. This is another example of eGovernment in Saudi Arabia, but the services are still not up to standard as sometimes they are slow and people have to wait to access their information, highlighting the importance of alignment between IS and other agencies in eGovernment.

[3.7.6. An eGovernment portal for Madinah city](#)

An e-portal has been introduced by the governance of the Almadinah Almunawwarah city. This portal is attempt to simplify synchronized services to small businesses and people in the city and to advance eGovernment availability to the general public and provide access to well-organized eGovernment services (Al-Khalifa, et al., 2017; Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008; Alsheha, et al., 2007). This project was completed in two stages. In stage 1, the city administration collected the project requirements by engaging all key stakeholders such as business people and representatives of the general public and the city administration. In stage 2, the project requirements were analyzed for prototype development so that the project

requirements could be specified (Aloud, et al., 2018; Alshehri, et al., 2012; Abdullah, et al., 2006). In this stage, the government also launched a training program in which the general public's awareness of the portal is developed.

3.8. Summary

This chapter presents details on the economy, culture and current eGovernment development in Saudi Arabia. The chapter also discusses the country's information technology-related programs in the domain of eGovernment and aspects that are likely to assist the implementation of eGovernment services.

The next chapter discusses the research methodology, which includes the evaluation of the proposed research on the impact of alignment in relation of improving eGovernment services. The chapter also presents the research philosophy, research design, research method and research strategy.

Chapter 4 Research methodology

4.1. Introduction

To conduct research within the allocated time and resources, it is important to discuss specific techniques or research procedures to identify, choose, manage, and evaluate information about a proposed research topic. This chapter discusses the design of an appropriate research methodology to achieve the research objectives and answer the research questions. The chapter details the proposed research philosophy, research design, research approach, strategy and research methods selected for this proposed research as well as the justifications for selecting these methods.

Moreover, the chapter discusses the data collection techniques for the qualitative and quantitative studies and business process modelling to align IS with other agencies in the eGovernment sector. This chapter focuses on the “what” and “why” of the selected techniques and methods and details of “how” the research techniques and methods were used are explained in Chapters 5, 6 and 7, respectively.

This research methodology is divided into two stages. In stage 1, we evaluate the research on the impact of alignment in terms of improving eGovernment services and business performance. The literature shows that most researchers have conducted studies on two types of alignment patterns: strategic fit of alignment between business and information systems departments and the structural fit of alignment between business and information systems departments (Pollalis, 2003). In this stage, we analyze and evaluate four different types of alignment patterns and their impact on government performance and services namely, strategic fit, structural fit, social fit and cultural fit between information systems departments and other government agencies.

In stage 2, we analyze the development of a successful IS in the context of alignment and show that eGovernment is not only necessary for the identification of IS requirements, organizational activities must also be taken into consideration before commencing the development phase of the system. In this stage, eGovernment business processes are modelled to attain the system requirements which will help to improve eGovernment services and the alignment process overall.

4.2. Research philosophy

The term research philosophy is a belief as to how the research data about a phenomenon should be collected, analyzed and used. Saunders et al. (2009) define research philosophy as how knowledge is developed and the fundamental nature of knowledge. Moreover, research philosophy involves significant suppositions on how to view the world of research and how to support the proposed research strategy, aims and research methodologies. According to Wilson (2014), research philosophy is significant in that it is fundamental in determining how to approach a research issue and impacts on how to conduct research.

Realism, positivism, interpretivism and pragmatism are four types of research philosophies according to Saunders et al. (2009). These research philosophies can be seen through the eyes of ontology, epistemology, axiology and data collection techniques (see Table 4-1). Mingers (2004) argues that the way researchers view the nature of reality and the role of values in research differ based on the philosophies they follow in a field of research to develop new knowledge. This section focuses on the philosophy of pragmatism, since the other research philosophies are out of the

scope of this research study. Table 4-1 provides a brief comparison of research philosophies with respect to ontology, epistemology, axiology and data collection techniques. Pragmatism states that the research question is the vital aspect of determining the research philosophy because pragmatism has the provision to work within both interpretivist and positivist philosophies (Saunders, et al., 2009). It can integrate various perspectives to support data collection and interpretation. Therefore, pragmatism guides the in-depth study of different phenomena that cannot be fully understood using only a qualitative or a quantitative method (Venkatesh, et al., 2013). The quantitative approach is largely based on deduction while the qualitative approach is based on induction. However, the pragmatic approach is based on abduction reasoning which moves back and forth between deduction and induction. This approach supports the use of both quantitative and qualitative methods in the same research inquiry (Maxcy, 2003; Howe, 1988).

This study uses abduction reasoning for the first phase of the research, where there are two different parts: the qualitative study part for inductive reasoning and the quantitative part for deductive reasoning. There are three key reasons to divide the research into two parts.

- The proposed study framework (see Figure 2-11) is derived from the related literature, where some factors are derived from the existing literature. Therefore, the applicability of the proposed study framework components to the eGovernment context require further evaluation by eGovernment experts.

- The data analysis of the qualitative study demands further investigation in relation to the factors included in the framework. Therefore, it is important to rank the alignment factors and sub-factors regarding the provision of additional information to the findings of the qualitative study. Hence, for this study, we collect data for the quantitative study from a wider audience of alignment and eGovernment services.
- Prioritisation of alignment patterns and included factors help to implement the alignment framework in an eGovernment environment.

Table 4-1: Comparison of Research Philosophies

| | Positivism | Realism | Interpretivism | Pragmatism |
|--|--|---|---|--|
| Ontology: the researcher's view of the nature of reality or being | External, objective and independent of social actors | Does the objective exist independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist) | Socially constructed, subjective, may change, multiple | External, multiple, view chosen to best enable answering of research question |
| Epistemology: the researcher's view regarding what constitutes acceptable knowledge | Only observable phenomena can provide credible data, facts. Focus on causality and law like generalizations, reducing phenomena to simplest elements | Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focus on explaining within | Subjective meaning and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meaning motivating actions | Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research questions. Focus on practical applied research, integrating different perspectives to |

| | | | | |
|--|---|---|--|--|
| | | a context or contexts | | help interpret data |
| Axiology: the researcher's view of the role of values in research | Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance | Research is value laden; the researcher is biased by world views, cultural experience and upbringing. These will impact on the research | Research is value bound, the researcher is part of what is being researched, cannot be separated and so will be subjective | Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view |
| Data collection techniques most often used | Highly structured, large samples, measurement, quantitative, but can use qualitative | Methods chosen must fit the subject matter, quantitative or qualitative | Small sample, in-depth investigations, qualitative | Mixed or multiple method designs, quantitative and qualitative |

The qualitative research process involves emerging patterns and procedures and data is usually collected in the participant's setting. It involves inductive data analysis to build theory from specifics and the researcher makes interpretations of the collected data (Creswell, 2009). Therefore, qualitative research largely relates to inductive reasoning. Quantitative research validates theories by investigating relationships between variables and various instruments can be used to measure variables (Creswell, 2009). Typically, the collected data can be analysed using statistical techniques. This type of research usually relates to deductive reasoning. An applied research philosophy can be presented using the pragmatist approach and the use of mixed methods is best justified through the paradigm of pragmatism (Tashakkori and Teddlie, 2008; Howe, 1988). Moreover, it is evident that the mixed method approach has pragmatist roots, according to Maxcy (2003). Therefore, this study adopts the philosophy of pragmatism using a mixed methods approach with both quantitative and qualitative research.

4.3. Research Strategy

With the rapid growth in new and complex information technologies and eGovernment services, organizations and governments continually face new challenges associated with understanding alignment capabilities, performance and impact. Moreover, the propagation of information over the Internet, the broadcast of everyday non-work linked system and social media, and the user-friendliness of many devices enabled with different IS technologies have resulted in technology being a vital part of people's lives. As a result of this rapidly changing environment, information systems researchers often encounter circumstances in which existing theories and findings do not suitably explain or offer significant vision into the development of strong alignment between business and IS. Mixed methods strategies offer a mechanism for information systems and alignment investigators to deal with such circumstances and therefore make contributions to theory and its employment. Table 4-3 provides an inclusive set of reasons why a mixed approach is an alternative to a single method approach.

Table 4-2: Mixed method approaches

| Research method elements | Description | Authors |
|---------------------------------|--|-----------------------------|
| Complementary | Mixed methods are used in order to advance a complementary perspective about the same relationships. | (Soffer and Hadar, 2007) |
| Completeness | This design is used to guarantee a complete picture of a phenomenon is obtained. | (Piccoli and Ives, 2003) |
| Developing | Questions for one element arise from the inferences of an earlier one or one element delivers hypotheses to be verified in the next one. | (Grimsley and Meehan, 2007) |

| | | |
|--------------|--|-------------------------------------|
| Growth | IS is used in order to explain or elaborate on the development of previous element of a study. | (Ang and Slaughter, 2001) |
| Confirmation | It is used to appraise the dependability of inferences attained from one approach. | (Bhattacharjee and Premkumar, 2004) |
| Recompense | It recompenses for the softness of one method by using the other. | (Dennis and Garfield, 2003) |
| Variety | IS is used to expand different views of the same phenomenon. | (Chang, 2006) |

For this research, three key strengths of the mixed methods approach illustrate the value of conducting such research on alignment in the context of eGovernment. First, mixed methods studies facilitate the possibility of addressing different research questions simultaneously. However, both qualitative and quantitative approaches can arguably be employed to address similar research questions, although qualitative methods have characteristically been employed more in alignment research and other social sciences to deepen an understanding of a phenomenon. Secondly, a mixed methods study provides more inclusive inferences than a single method or world view. It is believed that alignment in the context of eGovernment research that uses difficult qualitative or quantitative methods offers valuable insights on numerous alignment phenomena. Thirdly, mixed methods research provides an opportunity for a greater variability of divergent point of views. When viewing mixed methods investigation, a researcher may find dissimilar results, for instance unpredictable and complementary expectations, from the quantitative and qualitative elements.

4.4. Research design

Research and development in relation to eGovernment is facing some key challenges, which is our motivation for undertaking this research. These challenges are related to

processes, people, resources and information systems, as shown in Figure 4-1. We only deal with the challenges in relation to the process and information systems and we ignored the other two challenges related to people and resources, as we only deal with the challenges which are directly related to the process of establishing strong alignment in the eGovernment sector.



Figure 4-1. eGovernment challenges

The challenges related to the eGovernment process are complex and difficult to model because one business process may have many sub-processes which need to be explored to develop an information system which meets the government's expectations. The research method has two phases. In phase one, the aim is to apply fit as a co-variation in order to define the relationships between business and information systems in terms of strategy, structure, social issues and culture. Strong alignment between these relationships will result in enhanced business performance. Alignment is measured as conflictual if any of the selected alignment patterns score less than ($p < 0.05$). The business organization is considered to be strongly aligned if all the designated patterns score greater than ($p > 0.05$). Phase two addresses how to

model the business goals in the context of alignment between business and information systems.

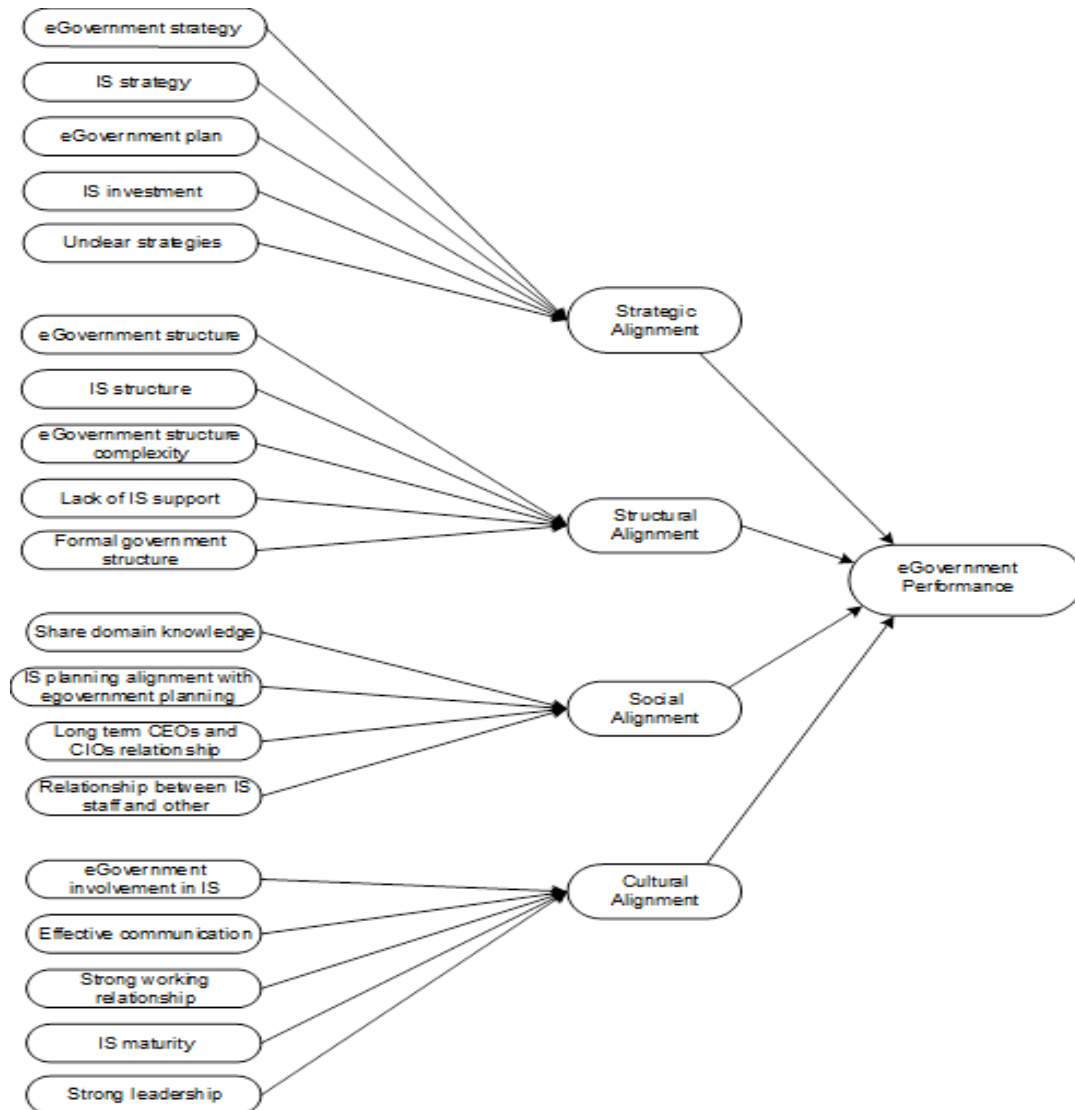


Figure 4-2. Key alignment dimensions and their factors (phase 1)

This proposed research includes several organizational factors, as shown in Figure 4-2. The strategic alignment pattern comprises five sub-factors, the structural alignment pattern comprises five sub-factors, the social alignment pattern comprises four sub-

factors and the cultural alignment pattern comprises five sub-factors. Moreover, this study uses three research methods, namely qualitative, quantitative and a case study.

Table 4-2 summarizes in detail the information on the proposed method of study.

Table 4-3: Methods of study

| Critical success factors | Method of study | Purpose Qualitative | Purpose Quantitative | Purpose of case study |
|---|---|---|--|---|
| <ul style="list-style-type: none"> • Strategic alignment • Structural alignment • Social alignment • Cultural alignment | <ul style="list-style-type: none"> • Qualitative • Quantitative • Case study | Interviews will be conducted with eGovernment experts on the importance of comprehensive patterns of alignment. | Studying four patterns of alignment (Business/IS Strategic alignment, Business/IS Structural alignment, Business/IS Social alignment, Business/IS Cultural alignment) in the context of improving eGovernment. | eGovernment business processes will be modelled to attain system requirements which could help to improve eGovernment services and the alignment process overall. |

The outcome of the process modelling part of this research will provide a solution for a suitable information system for eGovernment, but this is only possible if we are able to model the business goals and obtain the system requirements from the business goals, as shown in Figure 4-3. Clearly understanding the system requirements at this stage helps developers to design a system which meets the government's expectations.

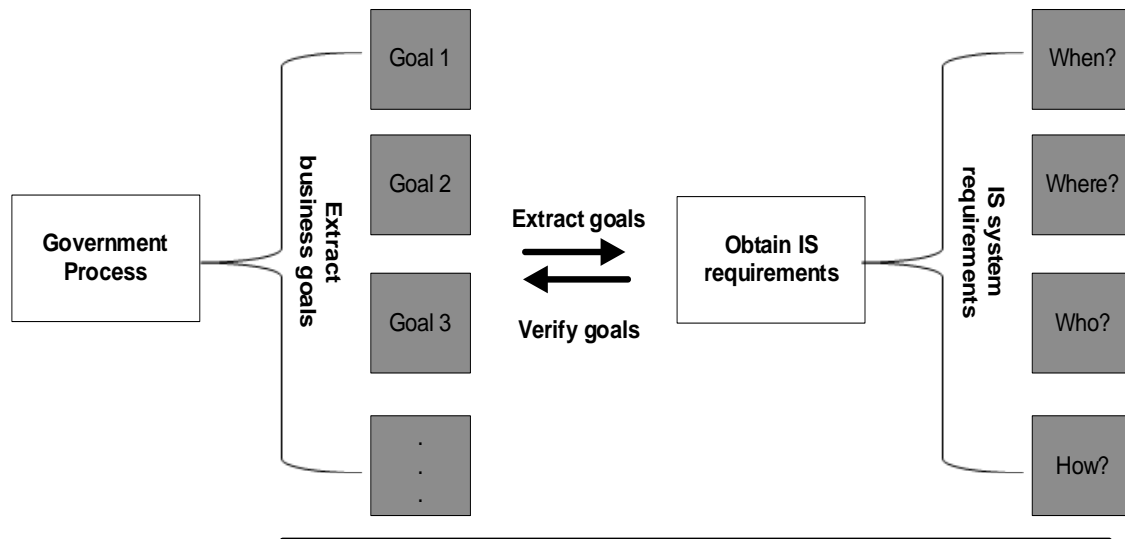


Figure 4-3. Process modelling for BISA in eGovernment services (Phase 2)

4.4.1. Data collection

The qualitative data were collected using semi-structured interviews with participants who have experience in eGovernment services. The semi-structured interview method was more suitable for this study than the other alternative data collection methods such as the Delphi technique, focus group discussions and observations, since it has several key advantages over the qualitative phase of this study. Moreover, the data collection comprises semi-structured interviews with participants who have information system roles and experience. There are several key reasons for choosing semi-structured interviews:

- Semi-structured interviews were helpful to confirm what was already known and reveal new themes by allowing interviewees the freedom to express their views in their own terms (Flick, 2009).
- One-to-one interviews provide the ability to obtain in-depth individual eGovernment alignment experiences with respect to a particular project (McAdam and Galloway, 2005).

- It gives those being interviewed the opportunity to ask questions of the interviewer to clarify a certain point or provide new ideas on the topic, thereby a semi-structured interview encourages two-way communication (Creswell, 2009).
- Usually, interview participants are not willing to share their personal project experience in front of superiors, peers and subordinates; thus, adopting one-to-one semi-structured interviews is appropriate for this study (Kraemmerand et al., 2003).
- In this study, there are four different patterns of alignment, where each pattern comprises several sub-factors. Therefore, it is very important for the researchers to develop a deep understanding of the topic so that interview questions can be prepared. In this context, a semi-structured interview data collection technique helps the researcher to prepare informal and unstructured interview questions by allowing the researcher to develop a strong understanding of the research topic.

Moreover, open-ended sequential questions have been used to guide the interviews. Each interview went for about an hour and a half to two hours and they were conducted in the offices of the interviewees. After each interview, the interviewer's notes and the interviewees' responses were reviewed for analysis.

The quantitative study is the second stage of this research. This phase comprises two levels: the first level of the data collection involving a questionnaire instrument with closed-ended questions, was distributed among the top 100 Saudi Arabian

organizations using a web application. In the second level, the target respondents for this study are categorized into three groups: managers who participate in government organizations, staff or users who operate government services, citizens and technical staff who maintain the government organizations' infrastructure.

A questionnaire is an instrument for gathering or collecting data, which involves asking questions (face-to-face or online) to the study participants. For the quantitative study, a questionnaire instruction for data collection was selected for the following reasons:

- For this phase, we require a large set of data from a large number of participants, which would be costly if the data were collected via interviews. A questionnaire is one of the most affordable tools by which to collect data quantitatively.
- This study phase requires the collection of data from a larger audience, for example, collecting data from more than 200 eGovernment users from Saudi Arabia. A questionnaire allows researchers to collect data from a larger audience.
- Collecting data from a larger audience could be a time-consuming process, however, a questionnaire allows researchers to collect data via any online media. This can save researchers time on quantitative data collection.

4.4.2. Data Analysis

Data analysis takes place at the end of each data collection phase. The method for analysing the qualitative data collected in phase one is thematic analysis which identifies aspects that have been captured during the interview sessions which helps to define constituent themes on the organization's performance. Moreover, thematic analysis was used to analyse cleaned and documented interview transcripts and eGovernment documents in the Saudi Ministry of Innovation. The thematic method is suitable for the qualitative phase of this study as this analysis method is appropriate for within-case examination (Souitaris, et al., 2012). Moreover, the thematic analysis method confirms the present themes, for example, variations in alignment patterns and their related factor rankings (King and Horrocks, 2019).

To analyse the quantitative data for this study, statistical tools such as SPSS and AMOS structural equation modelling (SEM) software were used to establish the convergent validity, discriminate validity, and consistency of the dimensions that have been addressed in the model. SPSS was used to analyze the demographic data such as the study participants' experience and educational background. Statistical tools also used to rank the alignment patterns and sub-factors using the arithmetical mean value and standard deviation. The AMOS tool was used to support our proposed alignment framework by encompassing standard multivariate analysis statistical methods, for example, factor correlation, covariance among selected alignment patterns and factor analysis.

The research design defines the overall strategy that is used to integrate different study components in a logical and coherent way. The research design is the plan the research study will follow to find answers to the research questions (Jones et al., 2006; Rousseau and Freid, 2001). The purpose of the research design is to ensure accurate assessment of the subject being investigated and determine the scope of the study. The research design in this study is divided into five stages, as shown in Figure 4-4. These stages are as follows: stage 1 comprises a general literature review of alignment in the context of eGovernment and the development of a research framework. Moreover, it also supports an over-all understanding of the research topic which is being examined on a larger scale. A systematic literature review was conducted to formulate the proposed conceptual research framework on the ideal pattern of alignment in the context of the eGovernment sector and in regard to finalizing the proposed research scope.

Stage 2 comprises the qualitative study framework and interview questionnaires. To collect data for this research, a semi-structured interview was used as a research technique. This technique was also used to evaluate the proposed conceptual PhD framework on alignment in the eGovernment context and the proposed framework was updated by improving and sanitizing the conceptual framework which is based on the literature review. This refining process of the conceptual framework was based on the thematic analysis outcomes. The qualitative results obtained from this level inform the second part of the study which entails quantitative research.

Stage 3 comprises the quantitative study, the questionnaires and the pilot study. In this stage, the questionnaire survey is used to collect the quantitative data. A pilot

study is conducted involving alignment and eGovernment experts so that the questionnaire's usability, accurateness and clarity can be improved. The data analysis in this stage is divided into two parts: 1) descriptive data analysis which shows the result of the demographic data; 2) ranking alignment factors, where all the sub-factors of alignment are ranked and their loading on their respective alignment patterns is investigated.

The qualitative and quantitative research outcomes indicate that alignment in the eGovernment sector of Saudi Arabia is a serious concern and if the government is able to align all the related departments, it will result in many benefits. Therefore, it is important to provide a solution to alignment in the eGovernment sector. The next stage provides detailed information on how to align the IS department with other agencies in the sector.

Stage 4 comprises the case study where government business processes are modelled to develop a suitable information system.

Stage 5 comprises the thesis discussion, implications and future research questions. This stage also discusses the theoretical and practical contributions along with future research directions.

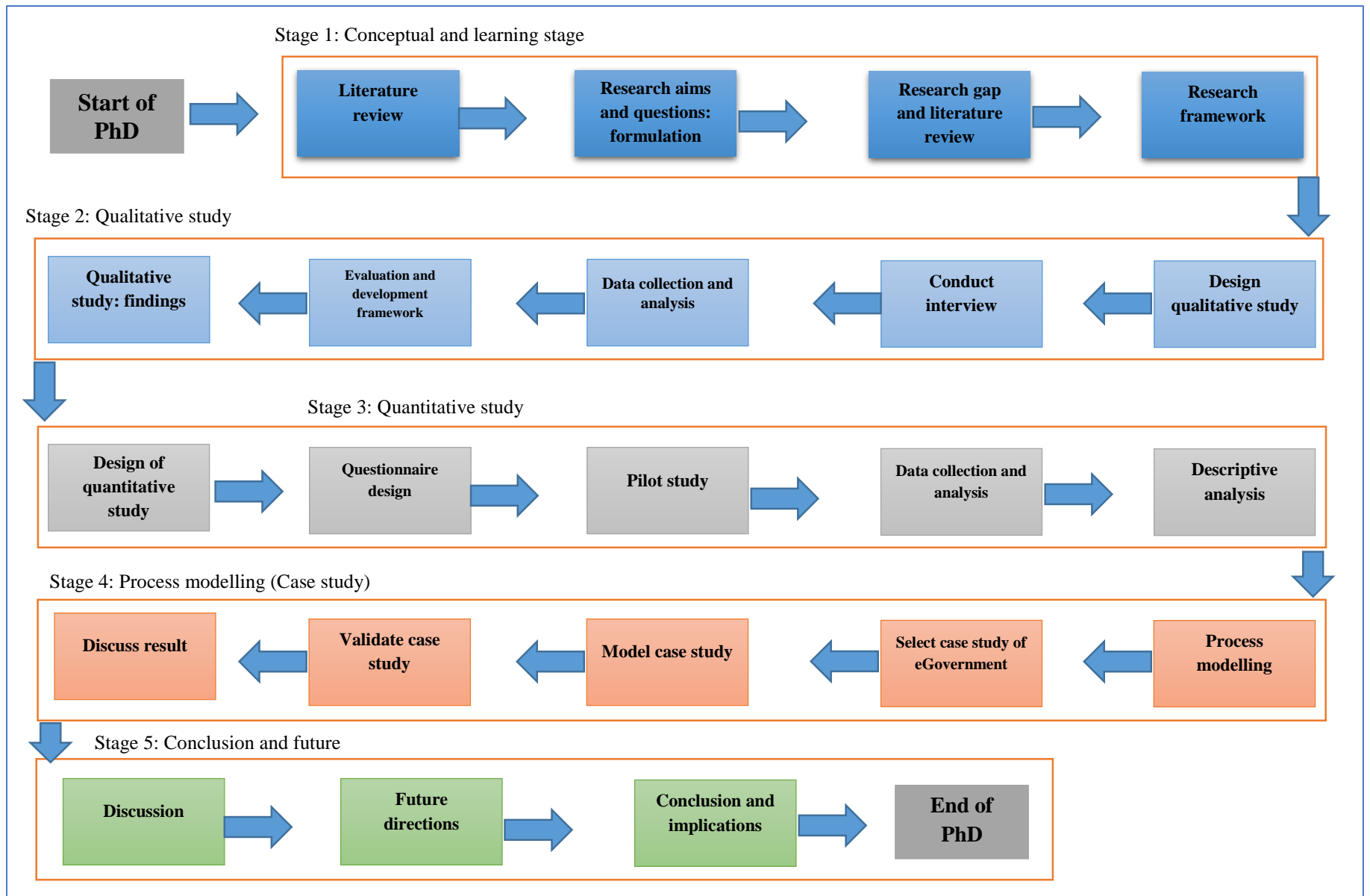


Figure 4-4. Research Design

This study uses a mixed method approach as the research design which involves both qualitative and quantitative studies. The mixed method design is categorised into six different types, as shown in Figure 4-5. Level 1, the triangulation mixed approach, can be used to “instantaneously collect both quantitative and qualitative studies, syndicate the study data, and use the results to capture a research issue”. The quantitative and qualitative data are collected separately. Level 2, the explanatory mixed methods approach, “involves first collecting quantitative study data and then collecting qualitative study data to help clarify the quantitative study results”. Level 3, the embedded mixed methods approach, is used to “collect quantitative and qualitative data instantly but to have one type of study data play a sympathetic part to the other type of study data” (Creswell, 2009; Creswell 2013; Morse, 2003). Detailed information on each level is discussed in the respective chapters of this thesis.

Level 4, the exploratory mixed methods approach, involves “the method of first gathering qualitative study data to determine a phenomenon, and then collecting quantitative study data to explain relations found in the qualitative study results” as shown in figure 4.5?. Level 5, the transformative mixed methods approach, involves “a design that uses a hypothetical lens drawn from societal justice as a predominant perspective” and is an approach involving both quantitative and qualitative data collected sequentially. Level 6, the multiphase mixed methods approach, is a design that includes both quantitative and qualitative data and by using this approach, the investigator is able to start with either the quantitative phase or the qualitative phase.

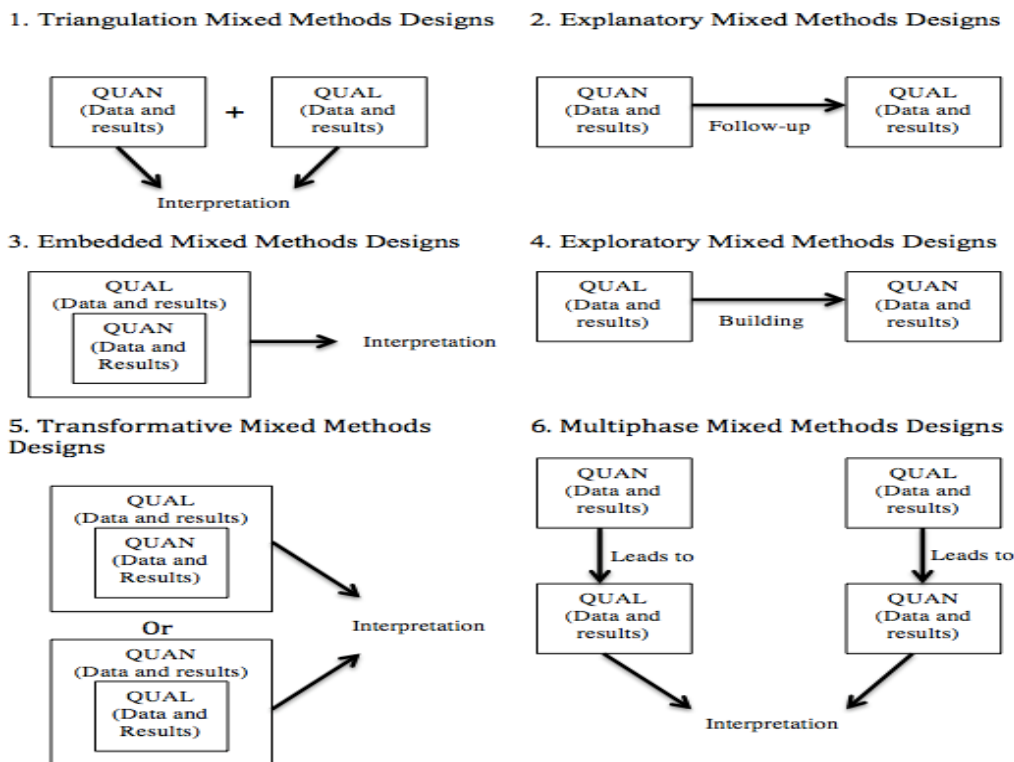


Figure 4-5. Mixed Methods types (Morse 2003, Creswell 2009, Creswell and Creswell 2017)

Mixed methods research has three key benefits when conducting this kind of research. First, it is very important to conduct mixed research simultaneously and this method allow researchers to investigate exploratory and confirmatory research problems instantaneously by using both quantitative and qualitative methods. Second, the mixed methods research approach has been proven to obtain more authentic results than research using a single method. Third, mixed methods research gives the researcher freedom to explore the topic in detail and to answer the research questions in depth (Teddlie and Tashakkori, 2009). This proposed research will use the exploratory mixed methods approach, with study data collected chronologically and with a multi-level sampling (Creswell and Clark, 2007). This helps the researcher understand the problem in detail and helps to strengthen the conceptual framework through expanding the research from qualitative to quantitative.

4.5. Research method

This section provides an overview of mixed methods research and how it can be used in the alignment and eGovernment domains. The mixed methods approach is a research design that uses a worldview of multiple research methods. Tashakkori and Teddlie (2003) identified two important types of multiple methods research: 1) mixed methods research; and 2) multi-method research. However, mixed methods and multi-method research have been employed interchangeably in many business domains.

There are significant theoretical differences between the two. In a multi-method research design, investigators use two or more research approaches, but may limit the research to a specific worldview. For instance, an investigator may use the participant's opinion and unwritten history to study the design and employment of a new information system in a business organization.

Mingers and Brocklesby (1997) presented a multimethodology which combines two or more mixed method approaches, for example, using both a survey and interviews in a research study or using a multimethodology with more than two methods. Moreover, combining two dissimilar methods within the qualitative paradigm as two distinct types of multiple methods investigation is usually measured as multimethodology. The authors recommended that multimethodology investigation can be achieved by means of either a single method or multiple individual methods. In contrast, mixed methods investigation by description is more in line with mixed procedures, which require multiple worldviews, for instance a mixture of qualitative and quantitative investigation methods (Tashakkori and Teddlie 2003).

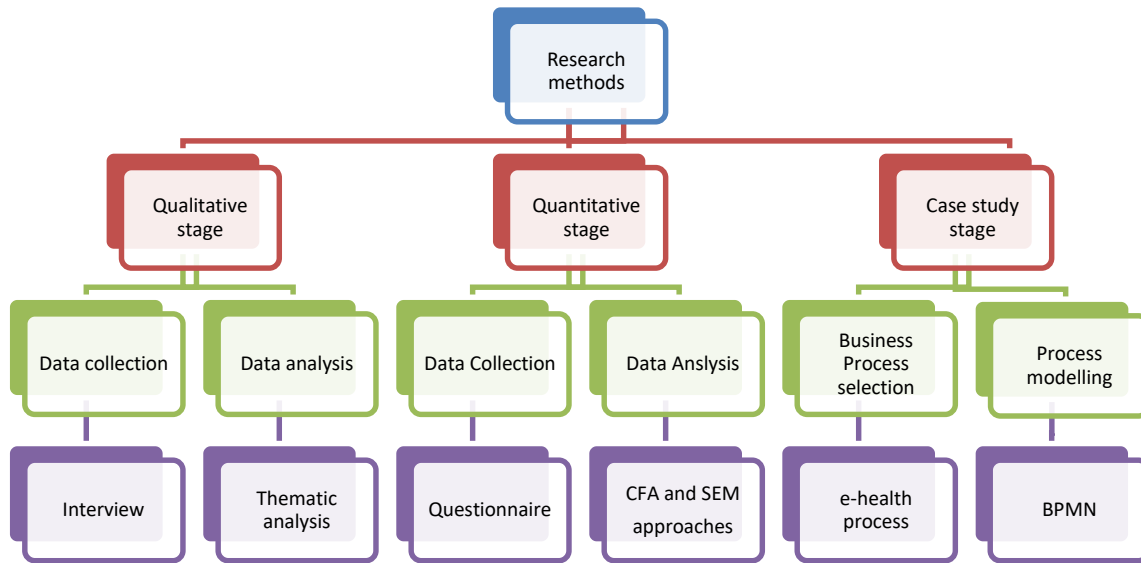


Figure 4-6. Research methods adopted

Figure 4-6 details the research instruments used in the qualitative, quantitative and case study phases. The qualitative stage comprises two steps: step 1 is the data collection where the eGovernment experts in Saudi Arabia were interviewed; and step 2 presents the data analysis using the thematic analysis approach. The quantitative stage comprises two steps: step 1 is the data collection where the eGovernment users in Saudi Arabia were surveyed; and step 2 presents the data analysis techniques using CFA and SEM. The case study stage comprises two steps: step 1 is the selection of the business process, where an e-health process in a health clinic in Saudi Arabia was selected; and step 2 presents the process modelling technique using the Business Process Modelling Notation.

4.5.1. Qualitative research

The qualitative research method is mainly exploratory research. It is used to obtain an understanding of the studied opinions, motivations and reasons by posing both open-

and closed-ended questions during an interview. This method helps to develop ideas for possible quantitative research (Mingers and Brocklesby 1997, Morse 2003, Creswell 2009, Creswell and Creswell 2017). Denzin and Lincoln (2009) defined qualitative research as investigation which explains phenomena in their archetypal settings to recognize people's thoughts. Qualitative research comprises gathering information on an individual's knowledge, including introspection, life stories, meetings, clarifications, historic details, communications and graphic text which are significant moments in people's lives. Detailed information on the qualitative study is summarized in Chapter 5 of this thesis.

For the data analysis in this research, the initial literature review on alignment between business and information systems in the context of eGovernment highlights the requirement for a reasonable review of the existing literature so that the research stream can be recognized, analyzed and distributed (Joffe, 2012). A thematic analysis approach has been identified as a suitable approach to analyze qualitative data, as it identifies developing themes linked to the idea in question. Thematic analysis offers a theoretically flexible approach to a qualitative study (Braun and Clarke, 2014; Joffe, 2012; Braun and Clarke, 2006).

4.5.2. Quantitative research

Quantitative research is a study method that includes the employment of structured questions. This method is used to quantify opinions, attitudes, behaviours, and other study variables or factors and simplify the results from a larger data sample. By definition, quantitative investigation must be independent and enumerative. Statisticians use formulas to determine what sample size will be necessary from a

given population to achieve findings with an acceptable degree of correctness and to compute the sample size for evaluation. Typically, researchers in the field of science seek large sample sizes with at least a 95% confidence interval, which means that if investigators re-conducted the survey a hundred times, 95 times out of 100 participants are agreed to participate in the study. For this proposed research, we conducted the qualitative study first, which leads us to identify further sub-factors which requires analysis using a large audience. The quantitative study was conducted among Saudi eGovernment service users.

4.5.3. Process modelling

Business Process Modelling Notation (BPMN), which was developed by a business process management initiative group, is greatly valued by business process investigators, academics and business analysts. The main objective of the BPMN technique is to offer standard UML notations which are easy for information system developers and other business participants to understand. It therefore uses a standard modelling language to fill the gap between the business model and information system implementation (White and Miers, 2008).

To provide a solution to the alignment between IS and other agencies in the eGovernment sector, we propose a system requirements engineering approach to determine the government's perspective on the system, which helps IS developers to develop a system to meet the government's needs. We use the BPMN approach to identify the system requirements for the government process.

This research conducted a case study on an appropriate eGovernment process. This involved modelling the process in order to analyze all the processes pertaining to the government's goals. This facilitated the identification of information system

requirements, which helps developers to devise an information system which meets the government's expectations and requirements.

4.6. Research ethics

Permission from the University of Plymouth was required to collect data from eGovernment services users and eGovernment experts. Therefore, ethical approval was obtained from the Faculty Research Ethical Approval Committee (FREAC) before collecting the data for this research study (Ethical Approval Application No: FREC1516.76). An approval certificate is in Appendix B.

The ethical principles and guidelines suggested by Longhurst (2003) were followed to ensure the participants' privacy, confidentiality and anonymity were guaranteed and each participant was required to sign a consent form to indicate they were participating voluntarily in the study. During the process of data collection for both the qualitative and quantitative studies, the participants were encouraged to provide a real scenario or examples to support the credibility of their information.

4.7. Summary

This chapter discusses the formulation of the research methodology to answer the research questions and to fulfil the purpose of the research. It summarises the research methodology, research philosophy, research approach, research design and the methods selected for this research with a rationale for this choice. The chapter discusses the research design and the mixed methods approach which was used for

the qualitative and quantitative data collection and analysis and the reasons for using mixed methods.

However, this chapter does not discuss the data collection and data analysis processes in detail as these are presented in Chapters 5 to 7.

Chapter 5 Qualitative data collection, analysis and findings

5.1. Introduction

To evaluate the proposed framework qualitatively and to answer research question one and research question two of this thesis: “What are the key patterns and their organizational factors that affect the alignment process in eGovernment services?” and “How can business and IS disciplines be aligned in the eGovernment sector in Saudi Arabia?”, a qualitative study was conducted.

This chapter discusses the qualitative phase of this study and explains why semi-structured interviews were conducted, the sampling technique, its purpose and the empirical data collection, the analysis of the qualitative data and the empirical findings of the study. Thus, this phase of the study answers the first and second research questions. By confirming the alignment factors to enhance the eGovernment environment and improve the services provided to the public. In the previous chapter, we discussed how this research was planned, including the research methodology and design, the data collection and the method of data analysis.

The chapter first describes the suitability of the semi-structured interview method for this study. Then it describes the data sampling technique applied in this study, followed by the design and development of the study questionnaire and the process of approaching the research participants and conducting the interviews and an explanation of the research methods and the thematic analysis. Subsequent sections cover the analysis approach and the qualitative phase findings.

5.2. Participant interviews for the qualitative study

Numerous types of interviews have been used in the field of qualitative research (Robson, 2002). For this study, a semi-structured interview technique was chosen over other available interview techniques to collect the data in the qualitative phase. Detailed information on semi-structured interviews is discussed in Chapter 4. A face-to-face interview with eGovernment experts was carried out using interview cards. An interview card sometimes refers to a prompt card which contains an abstract level of information about the topic being discussed during the interview and information which helps to direct the interview in an effective and efficient way (Saunders et al., 2009). During the interview process with the eGovernment experts, cards were used to ensure the emphasis of the interview was maintained regarding the assessment of the factors in field. The cards also comprise the list of alignment factors that positively impact the eGovernment environment.

Four cards briefly explain the overall interview process: the first card welcomes the interviewee; the second card asks about the interviewee's background education and experience; the third card collects data on the interviewee's knowledge about alignment in the context of eGovernment; and the fourth card used for the interview guidelines. Therefore, qualitative data can be investigated with the intention of uncovering new and hidden factors related to alignment between IS and other agencies in the eGovernment sector (Sedera and Gable, 2010).

According to Cassell and Symon (2004), investigators should follow a semi-structured interview method which starts with a welcome message to the participants and general information on the interview protocols that will be followed. The semi-structured

interviews enable investigators to ask open-ended questions about the study theme. Therefore, a semi-structured interview is suitable for collecting valuable data for the qualitative phase. The investigator utilizes inductive reasoning to understand the interviewee's point of view on the issues being studied. Interviews are suitable for discovering when, what, why, how and with what the alignment knowledge in the context of eGovernment have been formed, transported, retained and used during the process of establishment of alignment among eGovernment departments.

5.3. Sampling techniques

Data sampling techniques can be categorised into two groups: judgemental sampling techniques and probability sampling techniques. The non-random sampling technique and the non-probability sampling technique are used to select the data sample based on the research objective or research aim (Saunders et al., 2009). The quantitative research sampling technique is used to select a data sample randomly from a complete set of data, however, the qualitative research sampling technique seeks to choose a precise data sample of interviewees that would help in gaining detailed information on how to answer research questions. According to Oates (2018), qualitative research aims to discover issues related to research in detail rather than generalising research results, thus, in qualitative research the random sampling technique is not appropriate.

A non-probability sampling technique is practical and more suitable in the exploratory levels of research. The selection of the data sampling technique is based on the following: research aims and objectives, study questions and the related study strategy, since the data sample provides investigators with detailed information on

research which may enable researchers to answer the research questions and gain theoretic intuitions (Saunders et al., 2009). Rather, a reasonable association among the study objectives, purposes and the technique of sample selection is imperative. Hence, the data sample size is based on the study objectives and research questions, particularly, what is important for the proposed study, what will have reliability, how resources can be used effectively and what can be achieved from those resources, the suitability of the result findings, the likely groups for data analysis which could impact data and the size of sampling (Patton, 2015).

For this research, we approached a total of 35 eGovernment experts from the Saudi Arabian Ministry and 20 agreed to participate in this proposed research. All 20 participants were interviewed face to face, and each interview took approximately 1.5 hours.

5.3.1. Purposive sampling technique

In this research, the purposive sampling technique was selected rather than other non-probability techniques. Purposive sampling is useful in a situation where the investigator chooses a data sample or cases that are mostly informative and it enables the investigator to choose cases which help to achieve the research objectives and answer the study questions (Saunders et al., 2009). In this scenario, the researcher advertises for suitable participants using relevant channels such as journals or conferences, magazines or newspapers, websites or discussion forums or sending letters or emails to prospective participants. According to Patton (2015), some factors such as snowball, convenience, self-selection, purposive and quota affect the selection of study participants technique like non-probability sampling.

Moreover, the choice of the sampling technique is based on the viability of gathering data to address the study's aims and objectives and to answer the research questions, as well as the investigator's capability to gain access to individuals and business organisations (Saunders et al., 2009). In this context, the investigator needs to understand the research objectives, for example, what is possible based on the type or nature of the research. Saunders et al. (2009) suggested that the purposive sampling technique could be applied in cases where all sample members in one group are similar to each other, for example, some sub-factors of alignment belong to all four patterns of alignment. This allows the researcher to examine the group in detail during the research because the purposive sampling technique is appropriate for approaching study participants through social media such as Facebook, LinkedIn and through industry contacts. In our case study, the participants were contacted over the phone to obtain their initial agreement, after which they were sent an email detailing the study's purpose, objective, and research questions and they were also sent the consent form. Of the 20 interviews, 4 were conducted via a zoom meeting and 16 were conducted face to face. Prior to the commencement of the interview, the study participants were informed that the interviews were being recorded and their consent was requested.

5.4. Interview template development

Before we developed the interview questions, a detailed literature review was conducted to understand the field and to extract the factors related to alignment and eGovernment. Also, the literature review on alignment helped in developing an interview template by examining several features of the proposed theoretical

framework. Therefore, the knowledge gained from the literature review helped in the design and development of the semi-structured interviews by deriving the preliminary discussion points on the selected topic. In the context of the semi-structured interview format, as suggested by other researchers, the interview format is not completely structured so the study participants are able to share stories with the researcher (Flick, 2009).

For the qualitative study, an interview template was developed to address the first two research questions and to achieve the first four objectives of this study, as discussed in Chapter 1. The first seven questions in the template cover basic information on the interviewees, such as alignment knowledge and experience in information systems, knowledge of the importance of the use of information systems in the eGovernment sector and their organization's sector. The second section of the interview template comprises eleven questions covering the benefits of alignment between information systems and other agencies in the eGovernment sector. The third section of the interview template comprises four questions covering the factors that promote strong alignment in the eGovernment sector related to strategic, structural, social and cultural alignment.

Five academics from the information systems and eGovernment fields were approached to review the interview cards and the interview questions. Afterwards, the cards and the interview questions were sent to four alignment and eGovernment experts in Saudi Arabia as a pilot test. After the pilot test, it was recommended that the ten research questions be connected for further clarity and effectiveness. Moreover, after the initial feedback from the academics, the question template format

changed slightly and some questions were rephrased so that the questions and the interview cards were easier for the researcher and interviewees to understand.

5.5. Interview process

Before conducting the interviews, ethical approval was obtained from the Faculty Research Ethics Committee in the Faculty of Business (Ethical Approval Application No: FREC1516.76). The ethical standards in relation to the interview process were followed, for example, the guaranteed anonymity confidentiality and privacy of the participants, as recommended by Boeije (2010). For the qualitative phase in this research, interviews were conducted with 20 eGovernment experts in Saudi Arabia from February 2017 to December 2017. Before, we commenced the interviews, the research objectives were discussed with the interviewee and the interviewees were asked to sign the consent form. All the interviews were recorded which increased the validity and reliability of the study and reduced bias by obtaining confirmation from each interviewee.

The confidentiality and privacy of the interviewee were guaranteed. The investigator contacted the interviewee by phone and email to explain the study theme so that their consent could be obtained. The interviewees were asked to nominate an interview time that was most convenient for them and their preferred contact method, either Skype, face-to-face, or Zoom. Each interview took approximately 1.5 hours; however, each interview continued until the investigator obtained adequate information. At the end of each interview, the interviewees were asked if they agreed that the investigator could contact them for further investigation. Also, the interviewees were thanked for their participation in the study and for giving their valuable time.

A purposeful sampling technique was used to collect data from the eGovernment experts. We first approached eGovernment experts in Saudi Arabia and asked them to participate in the study. We then forwarded the interview questions to the experts who agreed to participate. A qualitative study was conducted to collect the data and a total of 35 business and IS experts from the Saudi Arabian Ministry were approached and 20 agreed to participate. The interview template comprised three sections. In section 1, we asked the participants about their education, skills, experience and their organizations to ensure the participants had relevant knowledge in the area of eGovernment and alignment. In section 2 and section 3, the participants were asked about the suitability and benefits of alignment between IS departments and other agencies in the eGovernment sector for the Saudi government. Table 5-1 depicts the participants' roles, their experience and the ministry for which they work.

Table 5-1. Demographic data

| Participants' Role | Years of experience | Ministry in Saudi Arabia |
|---|---------------------|--|
| System analyst | 10 | Interior Ministry |
| Information System manager | 5 | Foreign Affairs Ministry |
| IT support manager | 6.5 | Health Ministry |
| Business manager | 8 | Labour and Social Affairs |
| IS manager | 9 | National Anti-corruption Commission |
| Finance manager | 4 | Interior Ministry |
| IT analyst | 6.5 | Petroleum and Mineral Resources |
| System manager | 11 | Justice Ministry |
| IS engineer | 3.5 | Housing Ministry |
| IT manager | 8 | Environment Water & Agriculture Ministry |
| Application developer | 4 | Commerce and Investment |
| Technical support officer | 10 | Defence and Aviation |
| Business analyst | 6 | Commerce and Investment |
| Database administrator | 11 | Civil Service Ministry |
| Government consultant for information system department | 12 | Commerce and Investment |
| Network administrator | 5 | Interior Ministry |
| Data analyst | 4.5 | Commerce and Investment |
| Technology consultant | 7 | Education Ministry |
| IS security manager | 5 | Council of Saudi Chambers |
| Management manager | 10 | Interior Ministry |

5.6. Qualitative data analysis with the thematic analysis method

This chapter qualitatively investigates the ideal pattern of alignment and its benefits to the eGovernment sector. The qualitative method is suitable for this research for the following reasons: 1) the method allows for the development of further testing of the research; 2) it helps to understand the eGovernment experts' viewpoint on alignment; 3) it uncovers missing factors of alignment. In this research, we first provided detailed information on how the interviews were conducted and we discussed the sampling technique which was used. Second, we described the research method adopted for this research. The method employed in this work investigates patterns of alignment, namely: strategic alignment, structural alignment, social alignment and cultural alignment between IS departments and other agencies in the eGovernment sector.

Each pattern of alignment is further categorized into several factors as shown in Figure 5-1 and the loading of the factors on their related pattern of alignment is tested. Finally, we tested the fit of all four alignment patterns on the performance of alignment. This type of alignment fit is found in the information systems literature. For example, Henderson and Venkatraman, (1993) identified the importance of aligning internal and external enterprise domains. The authors included IT strategy and IT infrastructure and processes and on the external side business strategy and organizational infrastructure and processes.

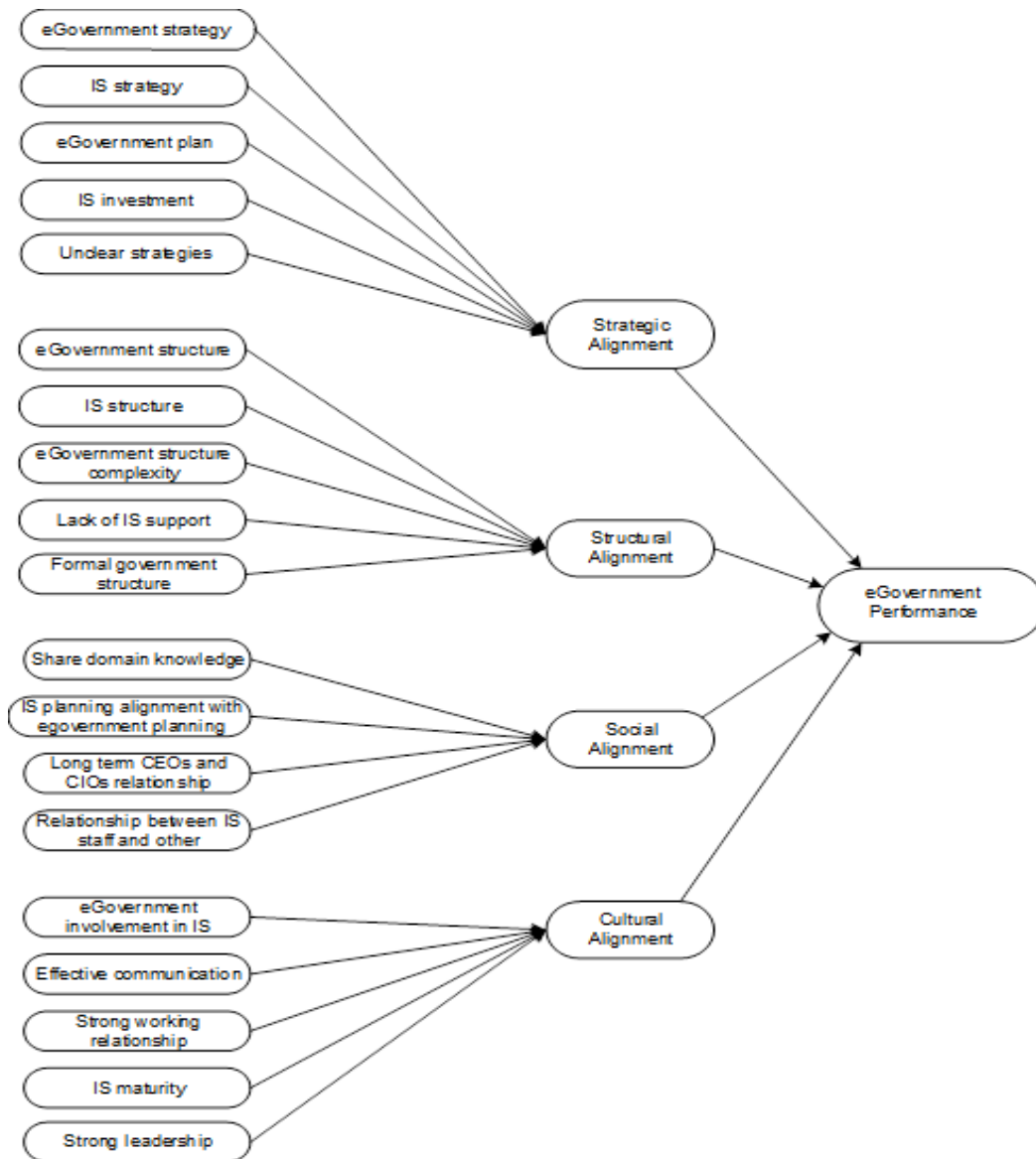


Figure 5-1: Key factors for BISA eGovernment services

The initial literature review on the process of alignment between business and information systems emphasized the requirement for a reasonable review of the existing literature so that the research stream can be identified the research stream to be analysed (Daly, et al., 1997). Through the thematic analysis approach, the factors that impact the alignment process in the context of eGovernment were identified and linked to the research questions. The thematic analysis approach offers a hypothetically flexible technique to a qualitative study or research that aims to classify and describe patterns of alignment (Braun and Clarke, 2006; Daly, et al., 1997).

Moreover, different ideas on alignment and the eGovernment sector were extracted through thematic analysis, and it was found that strategic alignment has five sub-factors, structural alignment has five sub-factors, social alignment pattern has four sub-factors and cultural alignment has five sub-factors. All these factors were identified through thematic analysis (Thomas and Harden, 2008; Daly, et al., 1997).

To answer our first and second research questions, as discussed in Chapter 1, we grouped each pattern of alignment into sub-factors, as shown in Figure 5-1. For each pattern, we applied Cronbach's alpha to measure the internal reliability or consistency among the factors and we identified how closely associated a set of factors is, as a group or pattern. A reliability coefficient of 0.70 or higher is considered acceptable in most technical and scientific research studies (Bland and Altman, 1997) Cronbach's alpha is calculated as follows:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

where N represents the number of factors, c-bar represents the average inter-item covariance between the factors and v-bar represents the sum of the average variance. If we increase the number of factors, the Cronbach's alpha value also increases. Moreover, if the average inter-item relationship is low, the alpha value will also be low. However, if the average inter-item relationship increases, the value of Cronbach's alpha also increases.

5.6.1. Thematic analysis

Thematic analysis is the process of identifying research themes through reading data

carefully and re-reading collected data (Rice and Ezzy, 1999). Braun and Clarke (2006) discuss research themes in the context of capturing key ideas among the data to find data patterns and key concepts. Patton (1990) advises that the logical process of thematic analysis that should not only be based on the implication of patterns, but also on the patterns' wider meanings and suggestions.

In the qualitative phase of this study, the data collected through the semi-structured interviews required further scanning and analysis. Therefore, there should be an appropriate approach for the data collected in the qualitative phase so that it can be analysed carefully. In our case, the thematic analysis approach was divided into five steps, as shown in Figure 5-2, as follows. Step 1 Initial data reading: once we received the interview scripts, we read the interview data line by line. Step 2 Coding: in this step, we identified the common patterns among the collected data, after identifying the alignment factors in the context of the four patterns of alignment. Step 3 Group patterns: once we identified the sub-factors of each alignment pattern, we then grouped them in their interest pattern of alignment. Step 4 Alignment factor ranking: once the factors were identified and grouped into their interest alignment pattern, we then ranked each sub-factor of alignment based on a five-point Likert scale, for example, factors that received the highest ranking of 5 on the Likert scale were ranked at the top and factors that received the lowest ranking of 1 on the Likert scale were ranked at the bottom. Step 5 Data analysis and discussion: in this step, we applied a reliability test to identify the relationship between each pattern of alignment.

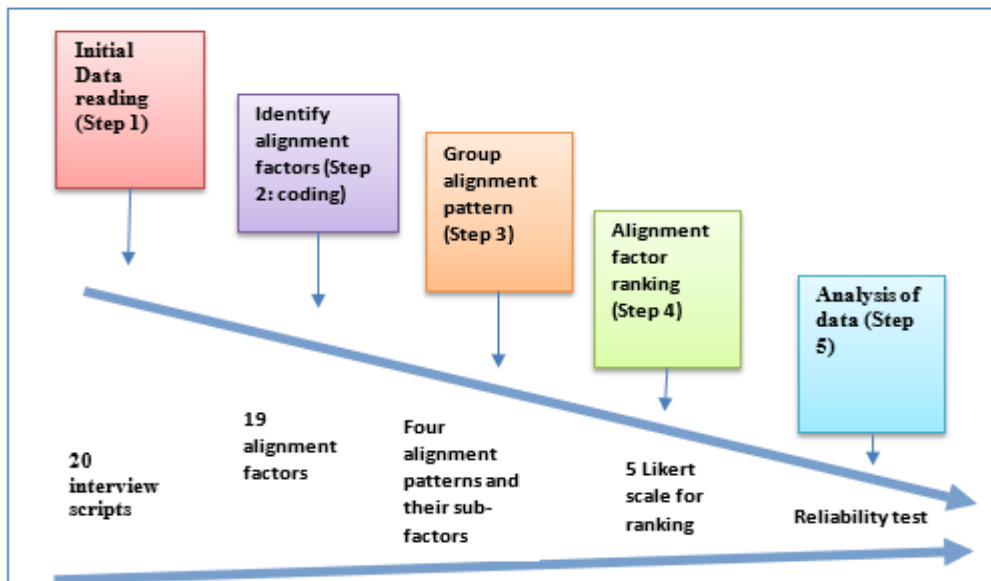


Figure 5-2. Thematic analysis process I

To perform the thematic analysis, NVivo software was used as it was specifically developed for mixed methods research and qualitative data and can be used to examine different types of research data such as image, text, video and audio data. The software is useful for this study for the following reasons: it enables the unstructured qualitative data to be analysed and organised, the software enables data to be uploaded in the form of audio and for thematic analysis to be undertaken.

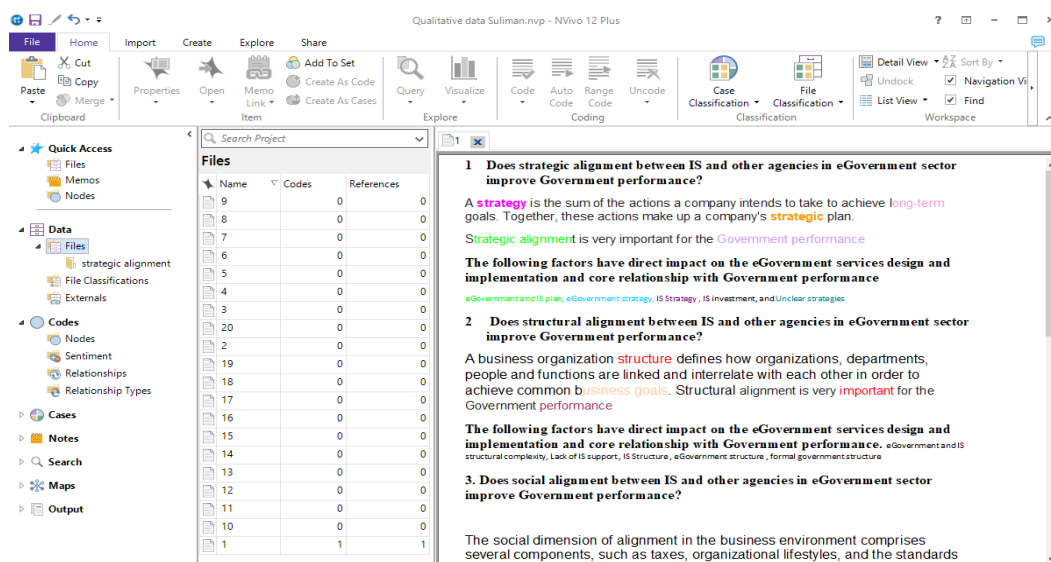


Figure 5-3. Interview scripts in NVivo software

The audio file of every interview was recorded as a word file and imported into NVivo software as shown in Figure 5-3 so that none of the interviewee responses were missed. Subsequently, the transcripts of all the interviews were carefully edited to identify irrelevant phrases or concepts which were not related to this study. Figure 5.2 presents the methods for qualitative data analysis which were used in this study and the methods that were applied to perform the thematic analysis (King and Horrocks, 2010; Dawson, 2002). Thematic analysis was used to identify new alignment and eGovernment performance themes so that the coding phase can be applied on the data sample and to confirm the themes generated from the interview scripts.

The coding step as shown in Figure 5-2 is divided into three activities: activity one, recognizing the study themes, for example what is this study theme about, how does it impact the study objectives and why are the study themes useful in relation to the topic. Activity two, recognising the relations among the different alignment patterns and sub-factors and the eGovernment sector. Activity three, obtaining the alignment factors for each selected pattern of alignment. This process is based on the data

analysis of the 20 interview transcripts and the frequency of occurrence of alignment terminologies. Moreover, the data at the coding stage was discussed with three qualitative research and thematic analysis experts so that coding reliability can be ensured.

Once the coding stage was completed, the study themes and their related factors were extracted from the interview scripts. Figure 5-4 illustrates how the thematic analysis was performed. The left-hand side of Figure 5-4 shows the clean data, the next section shows the sub-factors of alignment that were extracted for the selected pattern of alignment, based on the frequency of terminologies. Also, ranking of each sub-factor of alignment have been prioritised based on the coding result; Part 3 shows the loading of the sub-factors of alignment on their alignment patterns. Details of the thematic analysis results for each selected alignment pattern are presented in their related sections (sections 5.10.1, 5.10.2, 5.10.3 and 5.10.4).

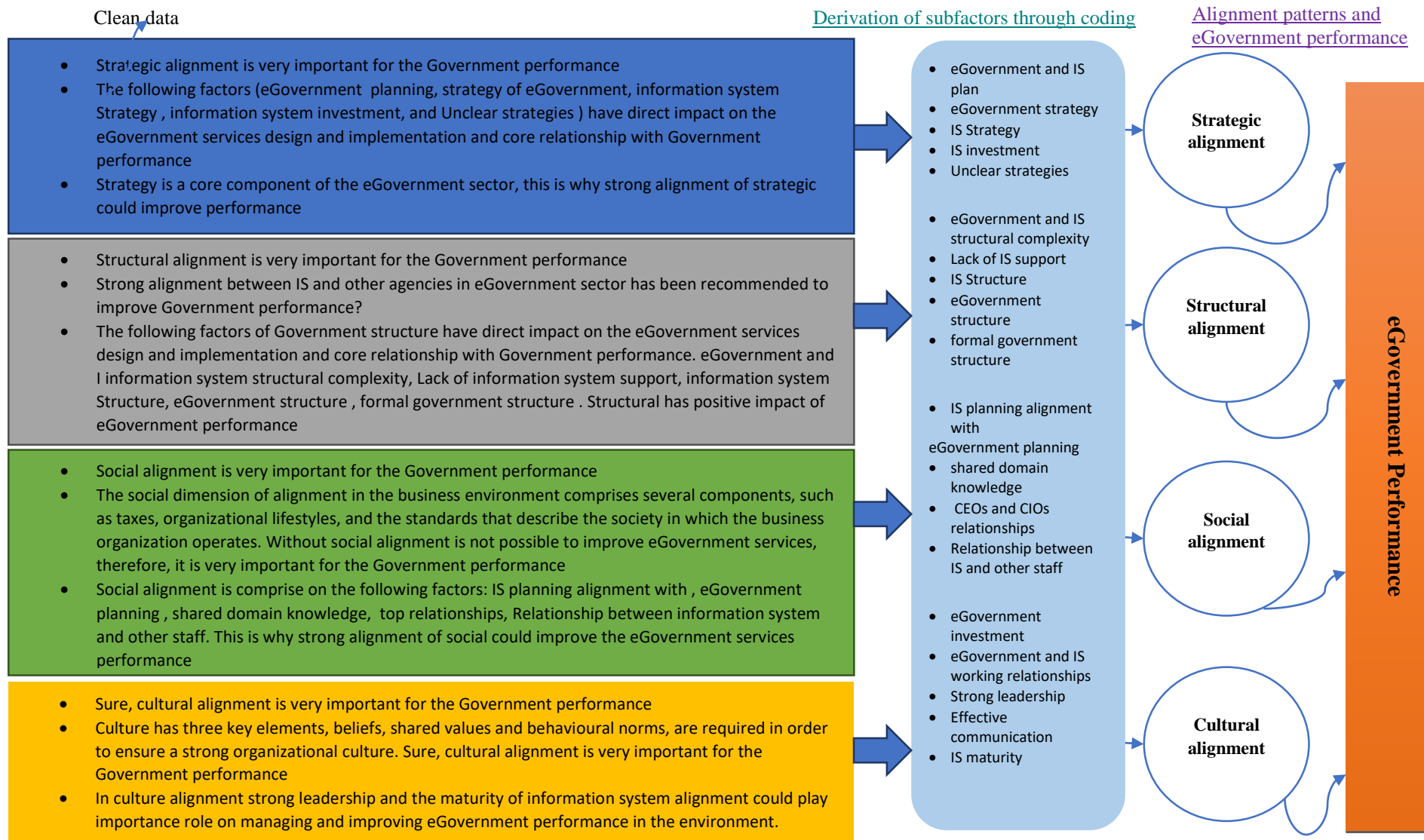


Figure 5-4.Results of the thematic approach

5.7. Measurement

The measures of the four patterns of alignment and eGovernment performance were taken from the business and management and eGovernment literature and organization theory (Bergeron, et al., 2004; Pollalis, 2003). The concept of fit was used to identify the relationships between the factors included in each pattern of alignment and the loading of each pattern of alignment on eGovernment performance. This research refers to the correlation between the following patterns of alignment: business and IS strategy, business and IS structure, business and IS culture, and business and IS social factors.

5.7.1. Business and IS strategy alignment

For the purposes of this research, the concept of the business strategic direction of business organizations was assumed to measure business strategy (Alkhuraiji, et al., 2016; Morgan, et al., 2016; Thatcher, et al., 2015; Ravishan, et al., 2011). This concept is different from the projected strategy as it emphasises the “development of resource pattern” that organizations use to achieve their business goals and objectives, defined at the business unit level and espousing a holistic rather than practical viewpoint (Shao, 2019; Das and Mishra, 2018; De Tuya, et al., 2017; Al-Majali and Md Dahalin, 2011). IS strategy is similar to business strategy although IS strategy reports on IS resources (Al Ghoson, 2010; Chan, et al., 2006; Li, et al., 2006; Bergeron, et al., 2004; Peppard and Ward, 2004; Hirschheim and Sabherwal, 2001; Venkatraman, et al., 1993). Based on the thematic analysis results in relation to strategic alignment between IS and other government agencies, the strategic pattern of alignment was grouped into five components to measure strategic alignment in the eGovernment sector. These are: eGovernment strategy; IS strategy; existing and

future plans for eGovernment; government investment in IS and eGovernment strategy which is unclear to the IS team (Jorfi and Jorfi, 2011; Kearns and Sabherwal, 2006; Bleistein, et al., 2005; Henderson and Venkatram 1999; Henderson and Venkatraman, 1992).

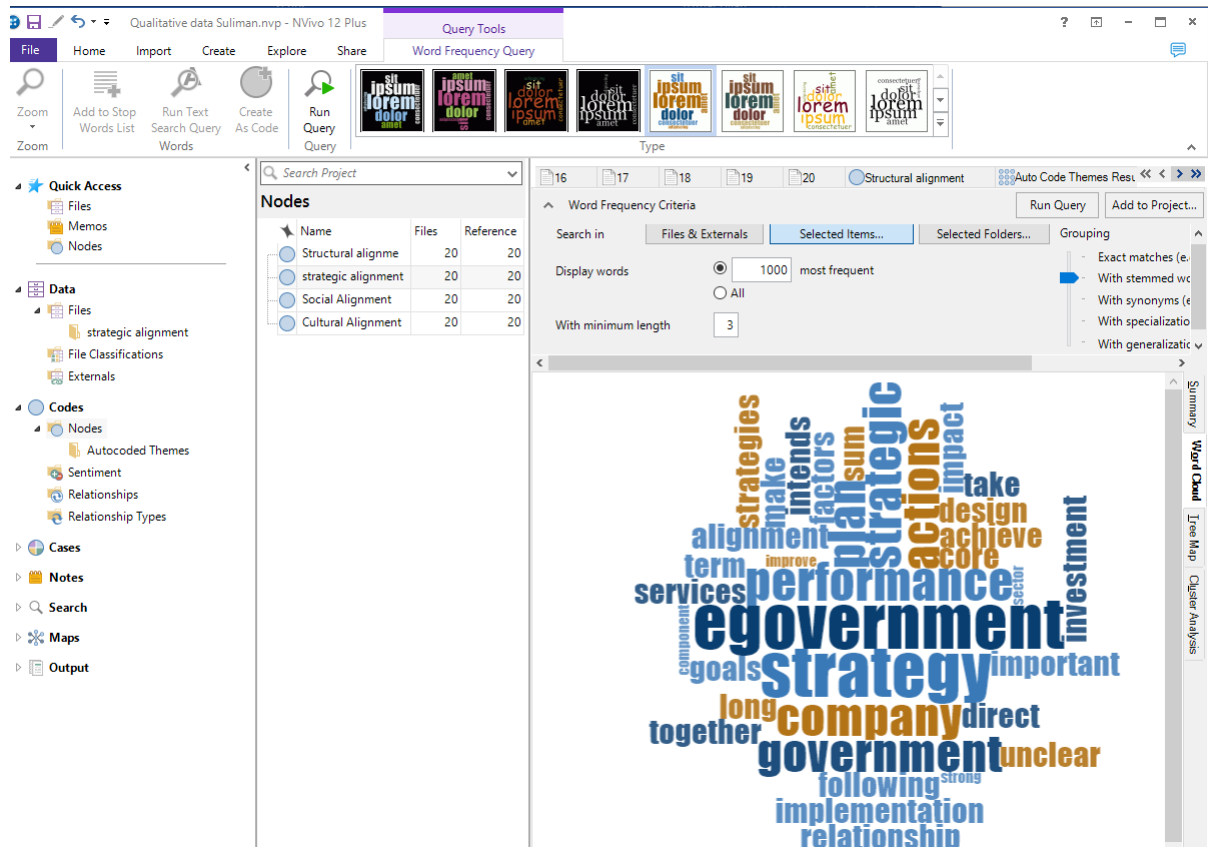


Figure 5-5. Thematic analysis results for strategic alignment

Figure 5-5 shows the thematic analysis results for strategic alignment between information systems and other agencies in the eGovernment sector. The results indicate that five sub-factors (eGovernment and IS plan, eGovernment strategy, IS Strategy, IS investment and Unclear strategies) loaded on the alignment pattern, which validates the qualitative framework. All the selected sub-factors of alignment are equally important for strategic alignment in the eGovernment sector and for the performance of eGovernment services.

5.7.2. Business and IS structural alignment

It is costly for a government to have many managerial workers and controls. Consequently, it is vital to eliminate meaningless managerial work within the eGovernment structure (Bisoyi and Li, 2019; Alkhuraiji, et al., 2016; Aslam, et al., 2016; Mirchandani and Lederer, 2014; Chung, et al., 2005; MacCallum, et al., 1996; Durand, et al., 1995; Cronbach, 1951). A structure defines how government agencies, departments, people and processes are connected and interrelated with each other so that the government's goals are achieved effectively.

The structural pattern of alignment is the most commonly used in business organization philosophy and IS studies. Based on the thematic analysis results of the structural alignment between IS and other agencies in the government, the structural pattern of alignment has been grouped into the following four: components to measure structural alignment in the eGovernment sector: eGovernment and IS structures; the complexity of the eGovernment structure that could impact on alignment performance; a lack of IS support from the government structure and an informal eGovernment structure (Wirtz and Daiser, 2018; Al Ghoson, 2010; Cordella and Iannacci, 2010; Gartner, 2007).

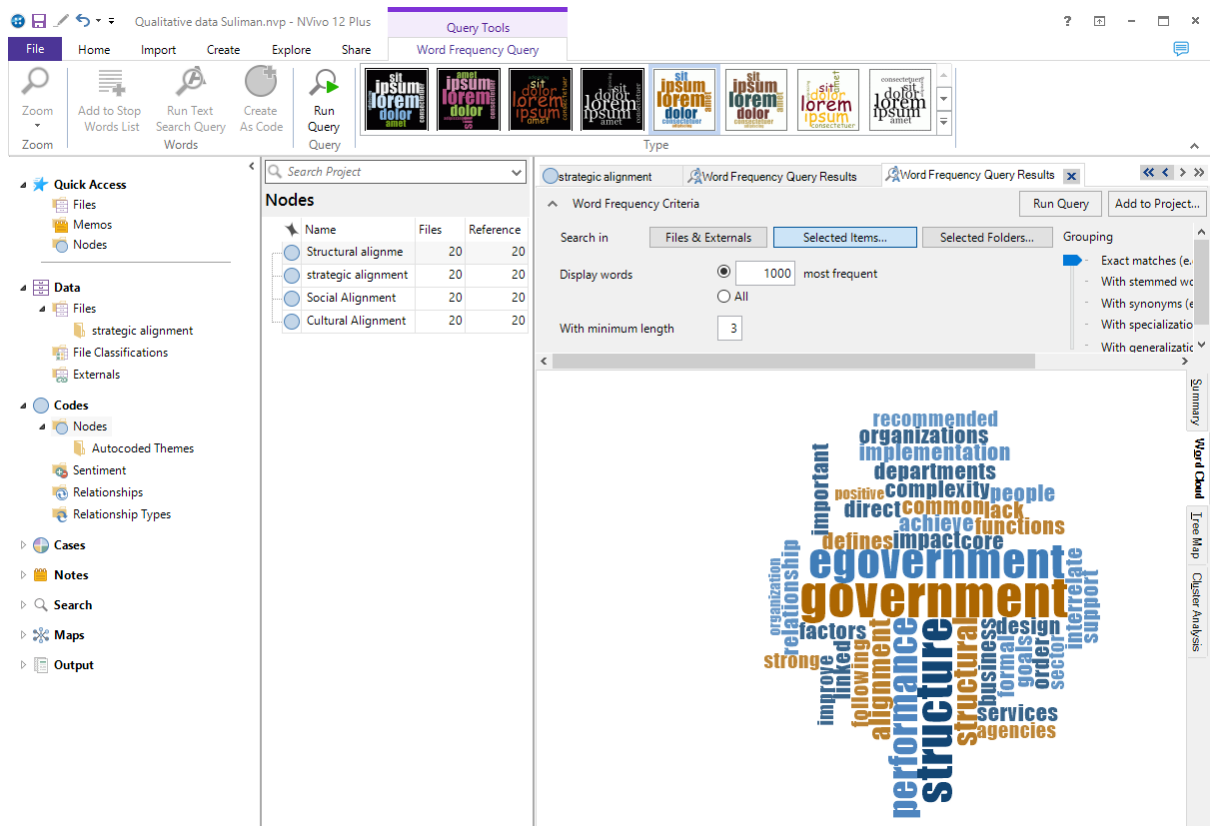


Figure 5-6. Thematic analysis results for structural alignment

Figure 5-6 shows the thematic analysis results for structural alignment between information systems and other agencies in the eGovernment sector. The results indicate that five sub-factors (eGovernment and IS structural complexity, lack of IS support, IS structure, eGovernment structure and formal government structure) loaded on the alignment pattern, which validates the qualitative framework. All the selected sub-factors of alignment are equally important for the structural alignment in the eGovernment sector and for the performance of eGovernment services.

5.7.3. Business and IS social alignment

Social alignment in the government encompasses several components, for example, organizational lifestyles, taxes and the standards that define the culture in which the government business operates. This dimension of alignment influences the capability

of the government to gain resources, provide services and implement processes that improve business performance (Santa, et al., 2019; Flores, Ramírez, et al., 2018; Abdullah, et al., 2006; Abanumy and Mayhew, 2005; Heeks, 2003). Based on the results of the thematic analysis of social alignment between IS and other agencies in the government, the social pattern of alignment is grouped into four components in order to measure social alignment in the eGovernment sector. The social alignment components are: shared domain knowledge among IS and other agencies in the government infrastructure; the involvement of the government's governing body in IS planning; the relationships between the CEOs and the CIOs and the relationship between the IS team and the people from other agencies in the government sector (Høgevold, et al., 2019; Gbededo and Liyanage, 2018; Moon, et al., 2018; Gallotti, et al., 2017; Heaselgrave and Simmons, 2016; Korhonen and Kaidalova, 2015; Karahanna and Preston, 2013; Van Den Hooff and De Winter, 2011; Teddlie and Tashakkori, 2003; Reich and Benbasat, 2000).

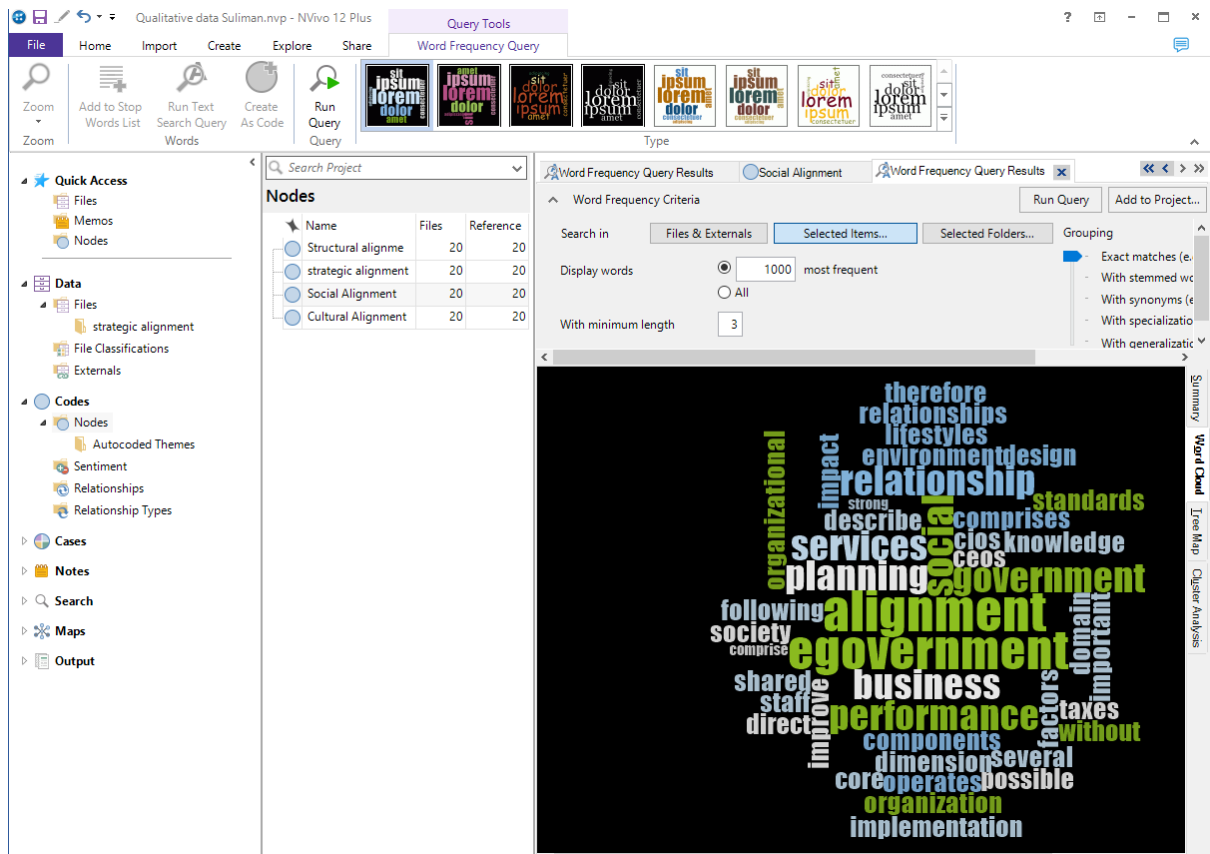


Figure 5-7. Thematic analysis results for social alignment

Figure 5.7 shows the thematic analysis results for social alignment between information systems and other agencies in the eGovernment sector. The results indicate that four sub-factors (IS planning alignment with eGovernment planning, shared domain knowledge, CEOs and CIOs relationships and relationships between IS and other staff) loaded on the alignment pattern, which validates the qualitative framework. All the selected sub-factors of alignment are equally important for social alignment in the eGovernment sector and for the performance of eGovernment services.

5.7.4. Business and IS cultural alignment

The culture in the government sector is strongly influenced by the diversity of the individuals in the organisation, as every person's habits and emotional aspirations to

achieve goals at work differ. Nonetheless, everyone's goal and emotional drives are different. This combination of people from different cultural backgrounds with different emotions may impact the overall performance of the government. Consequently, it is necessary for the government to ensure that management is effective to align all these people in a way that business goals and objectives are successfully attained (Santa, et al., 2019; Corradini, et al., 2018; Flores, et al., 2018; Abdullah, et al., 2006; Heeks, 2003).

The culture in IS departments has been studied by researchers since the early days of the information and communication technology discipline. In early research, culture in the field of IS was studied in terms of the two factors of values and beliefs (Shao, 2019; Friedman, et al., 2018; Heaselgrave and Simmons, 2016; Ravishankar, et al., 2011). However, based on the results of the thematic analysis of culture, several factors have been identified in the context of alignment: the involvement of eGovernment management in the IS department; the communication gap between IS and other agencies in the government; the working relationship among all staff members; the maturity of IS in the government infrastructure and the degree of cultural alignment between IS leaders and leaders from other agencies (Das and Mishra, 2018; Othman and Razali, 2018; Veeramootoo, et al., 2018).

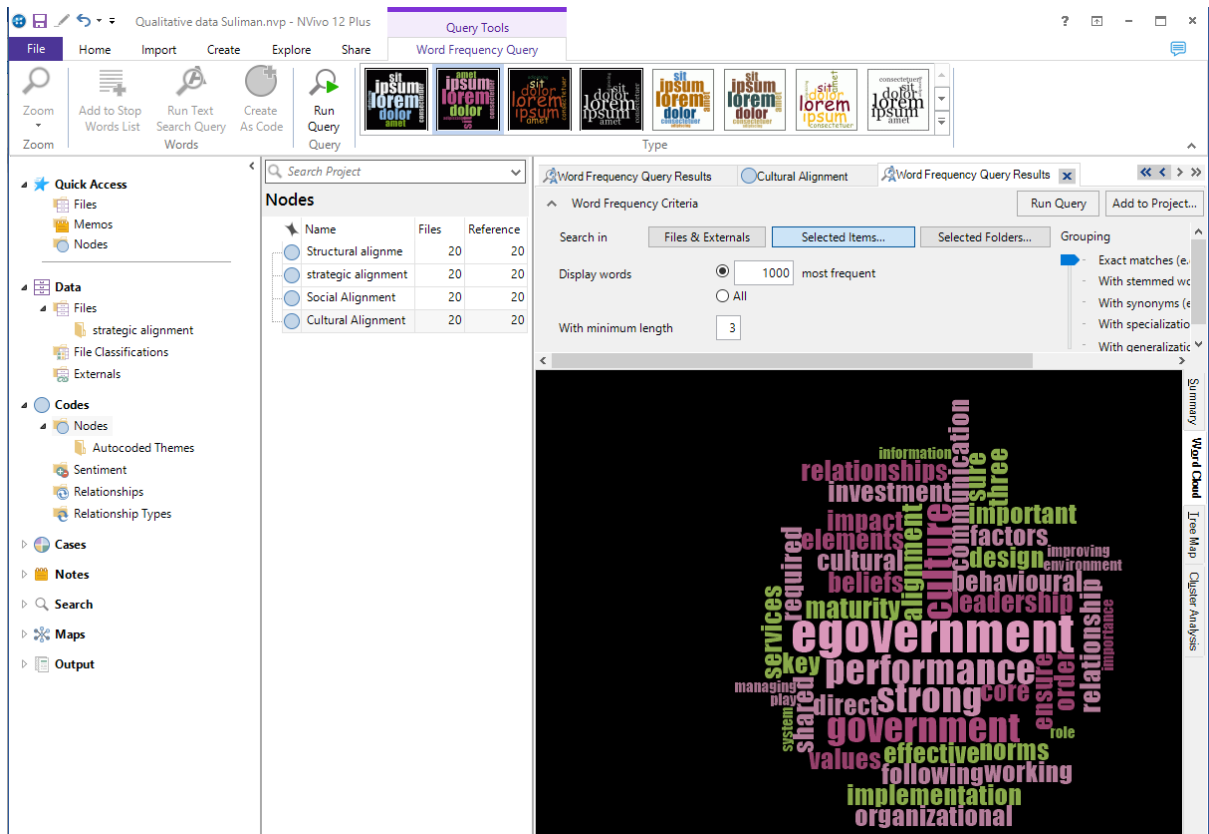


Figure 5-8. Thematic analysis results for cultural alignment

Figure 5-8 shows the thematic analysis results for cultural alignment between information systems and other agencies in eGovernment sector. The results indicate that five sub-factors (eGovernment investment, eGovernment and IS working relationships, strong leadership, effective communication and IS maturity) are loaded on the alignment pattern, which validates the qualitative framework. All the selected sub-factors of alignment are equally important for cultural alignment in the eGovernment sector and for the performance of eGovernment services.

5.7.5. eGovernment performance and alignment as fit

eGovernment is not a single entity, rather it has several levels and departments and each level must be aligned to enhance government performance (Flores, et al., 2018; Liu and Carter, 2018; Wirtz and Daiser, 2018; Al-Hujran, et al., 2015). The literature

on information systems management defines the performance of eGovernment from numerous perspectives (Al Ghoson, 2010; Cordella and Iannacci, 2010; Gartner, 2007; Abdullah, et al., 2006; Abanumy and Mayhew, 2005; Heeks, 2003). Based on the thematic analysis results, business performance is selected to measure performance in the eGovernment environment. This includes indicators such as government projects and return on investment, capital return and government profit per share, government future and market share.

In order to identify and examine the relationships between all these patterns of alignment and their impact on government performance, it is important that every pattern must fit together. The literature describes several types of fit methods: co-variation; mediation; gestalts; moderation; matching and reliability as a fit (Raup-Kounovsky, et al., 2010; Marsh, et al., 1988; Anderson and Gerbing, 1984). For this study, reliability as a fit has been selected to measure the reliability scale and identify the relationships between selected items in the scale.

Patterns of alignment and eGovernment management researchers have projected a subjective method to measure the performance of businesses (Almukhlifi, et al., 2018; Khasawneh, et al., 2013; Alshehri, et al., 2012; Al-Busaidy and Weerakkody, 2009). This type of method is more suitable in a situation in which businesses have unreliable or unavailable financial data. In this research study, people from senior management in eGovernment were asked to indicate on a 5-point Likert scale how their department or organization performed against each pattern of alignment. The descriptive statistics of the research components are presented in Table 5-2. The data results in Table 5-2 show the importance of each selected pattern of alignment and how the results of these patterns vary from one another.

Table 5-2. Descriptive data analysis

| Alignment Patterns | Minimum | Maximum | Mean | Std. Deviation |
|-------------------------------|----------------|----------------|-------------|-----------------------|
| Strategic alignment | | | | |
| eGovern_strategy | 3 | 5 | 4.35 | .671 |
| IS_strategy | 4 | 5 | 4.30 | .470 |
| eGovernment_plan | 3 | 5 | 4.25 | .550 |
| IS_Investment | 3 | 5 | 4.40 | .598 |
| Unlcear_eGovern_strategy | 3 | 5 | 4.45 | .686 |
| Structural Alignment | | | | |
| eGovernment_structures | 4 | 5 | 4.70 | .470 |
| IS_structures | 4 | 5 | 4.75 | .444 |
| e-govern_infra_complexity | 4 | 5 | 4.55 | .510 |
| Lack_of_IS_Support | 4 | 5 | 4.55 | .510 |
| Informal_e-govern_structure | 3 | 5 | 4.60 | .681 |
| Social Alignment | | | | |
| Shared_domain_knowledge | 4 | 5 | 4.60 | .503 |
| IS_planning_e-govern_agencies | 3 | 5 | 4.55 | .605 |
| CEOs_CIOs_relationship | 3 | 5 | 4.60 | .598 |
| Relationship_IS_and_other | 3 | 5 | 4.20 | .616 |
| Cultural alignment | | | | |
| e-govern_invlovement_in_IS | 2 | 5 | 4.25 | .851 |
| effective_communication | 2 | 5 | 4.00 | .725 |
| Working_relationships | 2 | 5 | 4.15 | .875 |
| IS_maturity | 2 | 5 | 4.00 | .795 |
| Strong_leadrsnip | 3 | 5 | 4.20 | .616 |
| Alignment | | | 4.85 | .366 |
| Strategic_alignment | 4 | 5 | 4.65 | .489 |
| Structural_alignment | 4 | 5 | 4.65 | .489 |
| Social_alignment | 4 | 5 | 4.55 | .510 |
| Cultural_alignment | 4 | 5 | 4.85 | .366 |

5.8. Ideal pattern of alignment

In this study, after we obtained the ranking of each factor of alignment in the context of their pattern of alignment, we applied a five-point Likert scale, where 1 represents “Strongly disagree”, 2 means “Disagree”, 3 means “Neutral”, 4 means “Agree”, and 5 means “Strongly agree”. After collecting the responses, the final interview template was divided according to the participants’ role and their organizational structure. To cross-validate the rank of each nominated factor and to achieve the aim of this research, we used statistical mean value, standard deviation, minimum, maximum and arithmetical reliability where the mean value is used to classify the average knowledge of alignment in the context of eGovernment. Standard deviation is used to classify the

spread of the rank of the factors in a selected sample of interviews. Minimum value represents the lowest rank in the sampler. Maximum represents the highest rank factors in the sample and Cronbach's alpha is used as the reliability statistic to measure internal reliability or consistency among the factors and identify how closely associated a set of factors is as a group or pattern.

5.8.1. Performance of strategic alignment

Strategic pattern of alignment: The strategic alignment between IS and other agencies in the context of eGovernment is grouped into five factors which have been derived from the literature review: 1) involvement of IS in the formulation of eGovernment strategy; 2) involvement of government management in the formulation of IS strategy; 3) eGovernment existing and future plans for the development of alignment; 4) the amount of government investment in IS and 5) unclear eGovernment strategy among the IS staff.

The first reliability test in this alignment pattern indicates the alpha coefficient for five factors is 0.68, suggesting that the strategic alignment factors have relatively low internal consistency. However, after removing the fifth factor "unclear eGovernment strategy", as shown in Table 5-3, the alpha coefficient for the four factors is 0.71, which indicates the remaining four factors of strategic alignment have relatively high internal consistency as shown in Figure 5-9. A reliability coefficient of 0.70 or higher is acceptable in the field of information systems and social sciences and a reliability coefficient below 0.50 is considered unacceptable. The selected factors have low consistency and interrelationships. In the case of the fifth factor, the coefficient is below 0.50 which is why this factor has been removed from the strategic alignment

factor and the overall coefficient value increased.

Table 5-3. Strategic alignment performance

| Total Statistics | | | | | |
|-----------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Strategic alignment factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
| eGovern_strategy | 17.40 | 2.568 | .548 | .591 | .631 |
| IS_strategy | 17.45 | 3.524 | .256 | .367 | .735 |
| eGovernment_plan | 17.50 | 3.105 | .407 | .258 | .689 |
| IS_Investment | 17.35 | 2.871 | .478 | .258 | .662 |
| Unlcear_eGovern_strategy | 16.30 | 2.326 | .45 | .20 | .45 |

This results indicate that strategic alignment in the context of eGovernment requires organizational design and an external environment is required for the government to maximize its profitability and effectiveness. In this case, the question is whether the eGovernment has defined its strategy clearly and is understood by every agency in the eGovernment sector, including the information systems department. Strategic alignment in the eGovernment sector improves collaboration with senior management in the government and IS areas. This will help the eGovernment to: set a vision for government outcomes; thoroughly assess opportunities under uncertainty; build a robust fact base; design an unlawful plan; win government stakeholders' support and assess development from the plan through to implementation to guarantee that strategies have a long-term impact. However, according to the eGovernment sector in Saudi Arabia, the factor "unclear eGovernment strategy" is not an important factor in the Saudi Arabian environment. In the Kingdom of Saudi Arabia, the government is in the early stages of implementing strong working relationships and implementing the eGovernment sector and for this, they have hired many highly qualified consultants from developed countries. Therefore, the government is already aware that government strategy must be understood by every stakeholder in the sector.

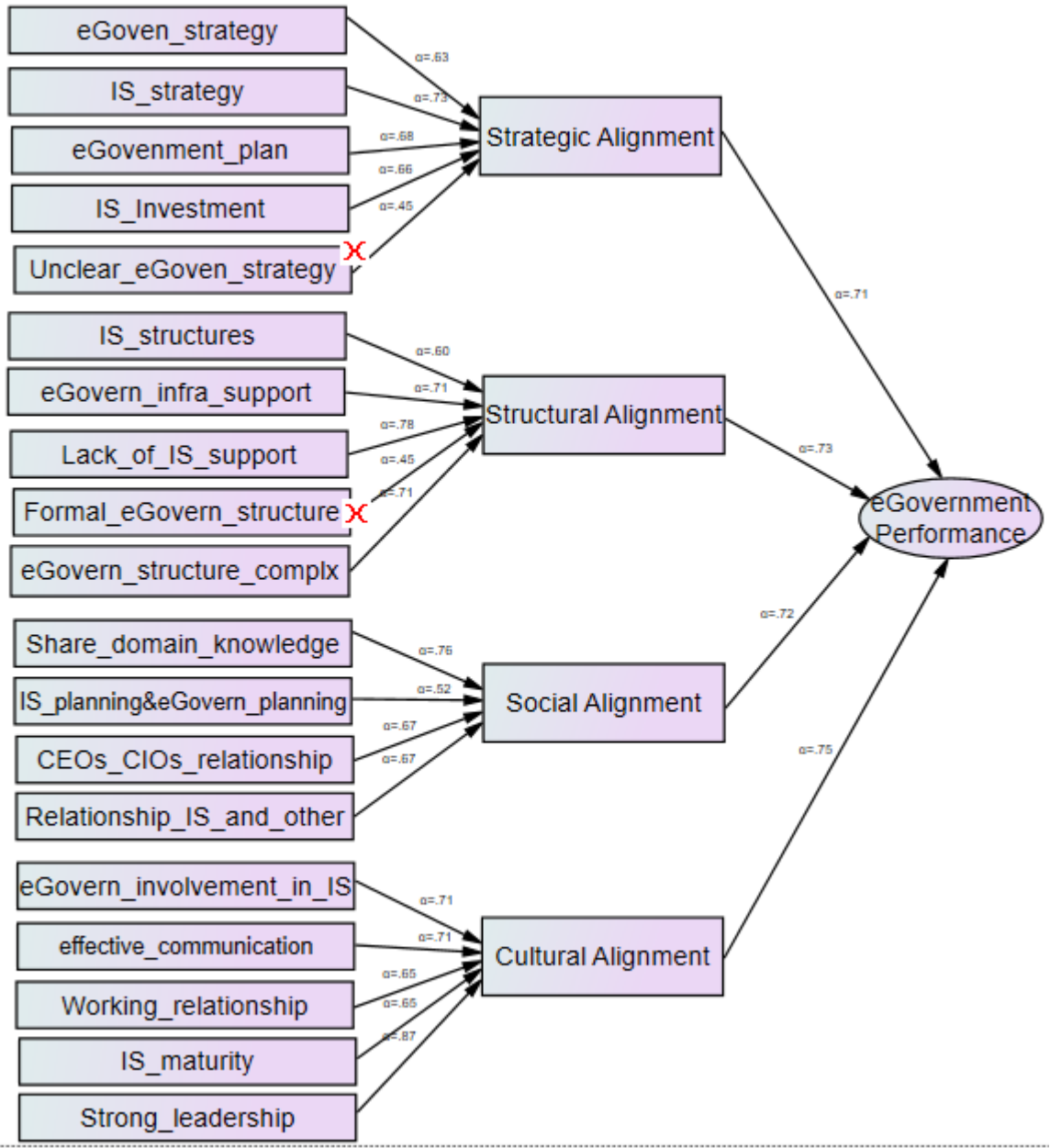


Figure 5-9. Framework of alignment based on the thematic analysis result

5.8.2 Performance of structural alignment

Structural pattern of alignment: the structural alignment between IS and other agencies in eGovernment has been categorized into five factors: complexity and flexibility of eGovernment structure; flexibility of IS to manage government requests; eGovernment infrastructure which is put in place to facilitate information and communication in the government domain; a lack of IS support for government and

informal structure of eGovernment. The first reliability test of this alignment pattern indicates the alpha coefficient for the five factors is 0.66, suggesting that the structural alignment factors have relatively low internal consistency. However, after removing the “informal eGovernment” factor, as shown in Table 5-4, the alpha coefficient for the four factors is 0.73, which indicates the remaining four factors of structural alignment have relatively high internal consistency, as shown in Figure 5-9.

Table 5-4. Structural alignment performance

| Total Statistics | | | | | |
|------------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Structural alignment factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
| eGovernment_structures | 18.45 | 2.050 | .680 | .802 | .665 |
| IS_structures | 18.40 | 2.937 | .751 | .784 | .604 |
| eGovern_infra_complexity | 18.60 | 2.463 | .289 | .634 | .715 |
| Lack_of_IS_Support | 18.60 | 2.358 | .263 | .353 | .788 |
| Informal_eGovern_structure | 18.10 | 1.155 | .684 | .683 | .452 |

This result indicates that the structural alignment in eGovernment in Saudi Arabia comprises specific hierarchies; team structures; workflows; reporting working relationships and information streams within the government infrastructure. Therefore, structural alignment in the context of eGovernment directly influences the design of both government and information system infrastructures, which supports the eGovernment structure. eGovernment experts in the kingdom of Saudi Arabia suggested that understanding how to align eGovernment structurally can help to implement the ideal infrastructure for government IS and technology needs.

Moreover, according to eGovernment experts, the Saudi Arabian government has started an eGovernment program, called “YESSER” in the Arabic language. The aim of this program is to provide world class and secure eGovernment services so that

everyone in the kingdom will be able to access services regardless of time or location by employing a variety of electronic means. Finally, the experts point out that the Saudi Arabian government is based on a formal not informal structure, therefore the “informal eGovernment structure” factor in our model received a low ranking.

5.8.3 Performance of social alignment

Social pattern of alignment: social alignment between IS and other agencies in eGovernment has been categorized into four factors: shared domain knowledge among IS and other agencies in the government infrastructure; the involvement of the government’s governing body in IS planning; relationships between CEOs and CIOs and the relationship between the IS team and people from other agencies in the government sector. The first reliability test in this alignment pattern indicates the alpha coefficient for the four factors is .072, suggesting that the social alignment factors have relatively high internal consistency, as shown in Figure 5-9. Moreover, Table 5-5 indicates that every factor in the social pattern of alignment is significant and contributes equally.

Table 5-5. Social alignment performance

| Total Statistics | | | | | |
|-------------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Social Alignment Factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
| Share_domain_knowledge | 13.35 | 2.239 | .336 | .204 | .761 |
| IS_planning_eGovern_age ncies | 13.40 | 1.516 | .749 | .581 | .521 |
| CEOs_CIOs_relationship | 13.35 | 1.818 | .509 | .431 | .677 |
| Relationship_IS_and_other | 13.75 | 1.776 | .513 | .294 | .676 |

This result indicates that all four factors are very important in order to establish social

alignment in the eGovernment sector. Saudi Arabia is a middle eastern country and at this present stage, it is in an advanced stage of designing and implementing its eGovernment. However, the government still faces several social challenges which can only be addressed through the social pattern of alignment. These challenges include citizens' security and privacy; lack of awareness and legal structure for online services; the public's limited access to the Internet; a lack of IS skills among citizens and a weak relationship between IS management and other agencies in the government. The experts also mentioned that the national eGovernment program acknowledges the requirement of effective communication between eGovernment and stakeholders.

5.8.4. Performance of cultural alignment

Cultural pattern of alignment: cultural alignment between IS and other agencies in eGovernment has been categorized into five factors: eGovernment administration involvement in the IS division; the communication gap between IS and other agencies in the government; the working relationship between all staff members; the maturity of IS in the government infrastructure and the cultural alignment of IS senior management with senior management from other agencies. The reliability test in this alignment pattern indicates the alpha coefficient for five factors is 0.75, suggesting that the cultural alignment factors have moderately high internal consistency, as shown in Figure 5-9. Moreover, Table 5-6 indicates that every factor included in the cultural pattern of alignment is significant and contributes equally in the management of cultural alignment in the eGovernment sector.

Table 5-6. Cultural alignment performance

| Total Statistics | | | | | |
|-----------------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Cultural alignment factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
| eGovern_involvement_in_IS | 16.35 | 4.976 | .617 | .549 | .716 |
| effective communication | 16.60 | 5.411 | .624 | .553 | .717 |
| Working relationship | 16.45 | 4.471 | .758 | .594 | .659 |
| IS maturity | 16.60 | 4.674 | .796 | .657 | .650 |
| Strong leadership | 16.40 | 7.621 | .012 | .178 | .870 |

According to the eGovernment experts, the Saudi Arabian government is currently planning to shift the country's economy from an oil-based production structure to a knowledge-based structure. To achieve this, the government introduced the idea of eGovernment to simplify the transfer of services between citizens, other agencies and the government. This acceptance of eGovernment and e-services is a step towards transforming the country into an e-society, which will improve the probability of an effective shift towards an economy based on knowledge. However, Saudi Arabia is a traditional society where the perception of IS technology and the acceptance of cultural values means that culture is a likely facilitator or inhibitor of eGovernment acceptance. Since culture is a determinant of how citizens respond, successful eGovernment utilization is not possible without modelling culture properly in the context of eGovernment acceptance. Therefore, the Saudi Arabian government has launched a 2030 vision, with the aim of aligning all government stakeholders culturally. Furthermore, the experts suggest that every factor of cultural alignment is important and claim that there is a significant correlation between cultural factors and the adoption of IS in the eGovernment sector.

5.9. Performance of eGovernment against each pattern of alignment

The second objective of this study is to identify eGovernment performance against each pattern of alignment: strategic, structural, social and cultural. Ullah and Lai (2013) suggested that if any government infrastructure followed these four patterns of alignment, its performance should improve rapidly. eGovernment performance results in saving money on government services; developing trust between the government and citizens; protecting citizens' personal information, providing citizens with fast government services and developing/maintaining government infrastructure effectively. In this study, we asked the participants if they felt the patterns of alignment improved the government's performance. The reliability test indicates that the alpha coefficient for four factors is 0.75, suggesting that the performance of the government will increase, as all four pattern results are moderately high, as shown in Figure 5-9. Moreover, Table 5-7 indicates that every pattern of alignment alpha value is significant and contributes equally to improve eGovernment performance.

Table 5-7. Ideal pattern alignment performance

| Item-Total Statistics | | | | |
|-----------------------------------|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| Ideal pattern of alignment | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| Strategic_alignment | 13.85 | 1.292 | .701 | .71 |
| Structural_alignment | 14.05 | 1.313 | .408 | .73 |
| Social_alignment | 14.05 | 1.103 | .650 | .72 |
| Cultural_alignment | 14.15 | 1.187 | .506 | .75 |

As eGovernment experts suggest that Saudi Arabia is still in the development stage, many business processes are still manual. It is therefore important to use IS to improve the speed and reliability of government business processes, which is only possible if the government infrastructure is comprehensively aligned. Moreover, the Saudi

Arabian government launched an eGovernment program in 2005 based on three building blocks: a united vision of government and an action plan, common practices and standards and a shared infrastructure. A huge proportion of the government's budget was allocated to the eGovernment program. However, the government was not able to realize all the benefits of this program due to a lack of alignment in the eGovernment infrastructure. Therefore, the experts strongly recommend the ideal pattern of alignment for the Saudi Arabian government.

In addition to the use of the ideal pattern of alignment to increase government performance, eGovernment experts in Saudi Arabia also suggest that evaluating and measuring government progress has become a priority for decision makers in the country, as the government continually aims to determine the benefits of using IS technologies in government management to enhance internal competency and increase the efficiency of government plans. In order to respond to this request, this ideal pattern of alignment can help to measure every aspect of government infrastructure.

Moreover, the literature also suggests that it is important to address the complexities involved in the use of IS to support the public sector, so researchers introduced the term eGovernment (Garín-Muñoz, et al., 2019; Jones, 2012). An eGovernment is the use of information and communication technologies (ICTs) to improve the activities of public sector organizations (Almukhlifi, et al., 2018; Vicente and Sussy, 2018; Khasawneh, et al., 2013; Alshehri, et al., 2012). Some researchers restrict their definition of eGovernment to the Internet and its applications only, or to the establishment of communication between government actors and other external

groups (Alshehri, et al., 2010; Al-Busaidy and Weerakkody, 2009; Al-Fakhri, et al., 2008).

5.10. Summary

This chapter examined the impact of the ideal pattern of alignment between IS and other agencies in Saudi Arabia. The data was collected from 20 eGovernment experts from different sectors in the field. The ideal pattern of alignment is based on four measures of alignment: strategic, structural, social and cultural alignment, each phase being derived from the alignment and eGovernment literature. This chapter details the study of this ideal pattern of alignment in the Saudi Arabian eGovernment sector and the results indicate that the Saudi Arabian government is eager to obtain the full benefits from IS development and has started many new and innovative IS programs such as the high budget program “YESSER” and the 2030 vision. However, the study results show that the government is still not able to achieve its goals due to a lack of alignment between IS departments and other government agencies.

Therefore, eGovernment experts in the Kingdom suggested that this ideal pattern of alignment can achieve high business performance in terms of growth which leads to increased long-term government success and that this model can help establish internal and external government relationships. This proposed method of alignment could be very useful in the current situation of the Saudi Arabian eGovernment sector.

This study requires further examination using a larger audience to evaluate the strength of this proposed method of alignment. Our next step is to conduct a quantitative study among eGovernment users in Saudi Arabia

Chapter 6 Quantitative data collection, analysis and findings

6.1. Introduction

To analyse the degree of satisfaction of customers in eGovernment products and services in Saudi Arabia and to evaluate the proposed research framework for a larger , a quantitative study is conducted. In the previous chapter, the factors belonging to an ideal pattern of alignment were extracted and validated by eGovernment experts in KSA. This chapter validates the proposed framework of an ideal pattern of alignment quantitatively among eGovernment users in KSA, as quantitative research is very useful to quantify the real issue by way of generating study data which can be converted into useful facts or numerical data. It is also useful for studying large data samples and to quantify participants' attitudes, thoughts, behaviours, and other variables related to the study. Therefore, a quantitative study allows us to evaluate the proposed alignment framework for a large population, which will also strengthen the reliability and suitability of the framework.

This chapter also presents the continuation of the data collection and provides an evaluation of the proposed framework in the context of its reliability and validity. Moreover, quantitative data analysis is important in order to assess the framework including the factors that influence an individual's acceptance of eGovernment services and, in the context of Saudi Arabia, how alignment between eGovernment agencies and IS helps to improve the quality of eGovernment services.

Based on the qualitative results and identification, a questionnaire for quantitative research was designed. The purpose of this questionnaire is to identify the ideal

patterns of alignment and to verify the proposed alignment framework among eGovernment users. A nominal scale in SPSS was used for questions related to descriptive data, such as, a participant's personal data and background. In Sections two and three of the questionnaire, we used the scale in SPSS, as questions in these sections are related to the four patterns of alignment, strategic, structural, social and cultural alignment between IS and other agencies in the eGovernment sector, where each pattern is further divided into sub-factors.

The quantitative analysis in this study requires further examination before the data is analyzed to find missing values in the collected data and outliers, as well as data screening and data coding of participants' responses. This process starts before evaluating and validating the data normality. Then the descriptive statistics are presented which include statistical percentage, mode value, frequency and mean value. For the analysis of the descriptive data's demographic variables, independent factors and dependent adoption variables were identified. Subsequently, the statistical reliability and validity of the collected data was assessed before advanced level statistics were considered. Then, the cause and effect relationships between the study factors were evaluated by implementing inferential analysis, where we implement factor analysis in order to load all the associated and correlated factors of one pattern of alignment, to assess the hypothesis about the factors' loadings on their alignment pattern. For every factor in the framework, there is loading which indicates how alignment patterns are fit for or how patterns fit into the framework.

6.2. Quantitative data collection

To collect the data, the questionnaire was posted online via Survey Monkey and potential participants were contacted through my personal contacts in the Saudi Ministry as well as via social media channels. The data were collected over 5 months and 6 days. To collect the data, a total of 305 eGovernment users who use eGovernment services in any way, for example, ePassport, eHealth, financial support, eTax, were approached. However, only 70% of the eGovernment users participated in the study and we received 253 responses. Data from 53 participants were removed for the following two reasons: data were incomplete, or the responses were from someone who has never used eGovernment services. Data from the final number of 200 participants are included in this study.

6.2.1. Questionnaire design

For this study, a survey technique is used to collect quantitative data from eGovernment users, which helps to rank alignment patterns and their related sub-factors. This section discusses the questionnaire design and provides information on the pilot test, sampling strategy and participant information. A questionnaire design in a quantitative study delivers a numeric or quantitative research explanation of the opinions of eGovernment users, attitudes or trends by studying a data sample (Creswell and Clark, 2007). Moreover, the questionnaire technique is suitable for measuring the attitudes of the study participants and identifying other concerns of the participants. Therefore, the questionnaire technique was perceived to be inconspicuous by the participants, it was an easy way to collect data from a larger population at a low cost, and it has reasonably high reliability and validity for a validated and well-structured study questionnaire (Tashakkori and Teddlie, 2002). According to Saunders et al. (2009) questionnaires in a quantitative study help to

gather data by asking the study participants to answer the same set of study questions and the data gathered can be analysed using computer applications. In designing and developing the study questionnaire, investigators must be certain about the data to be gathered which then enables them to attain precise data regarding the research.

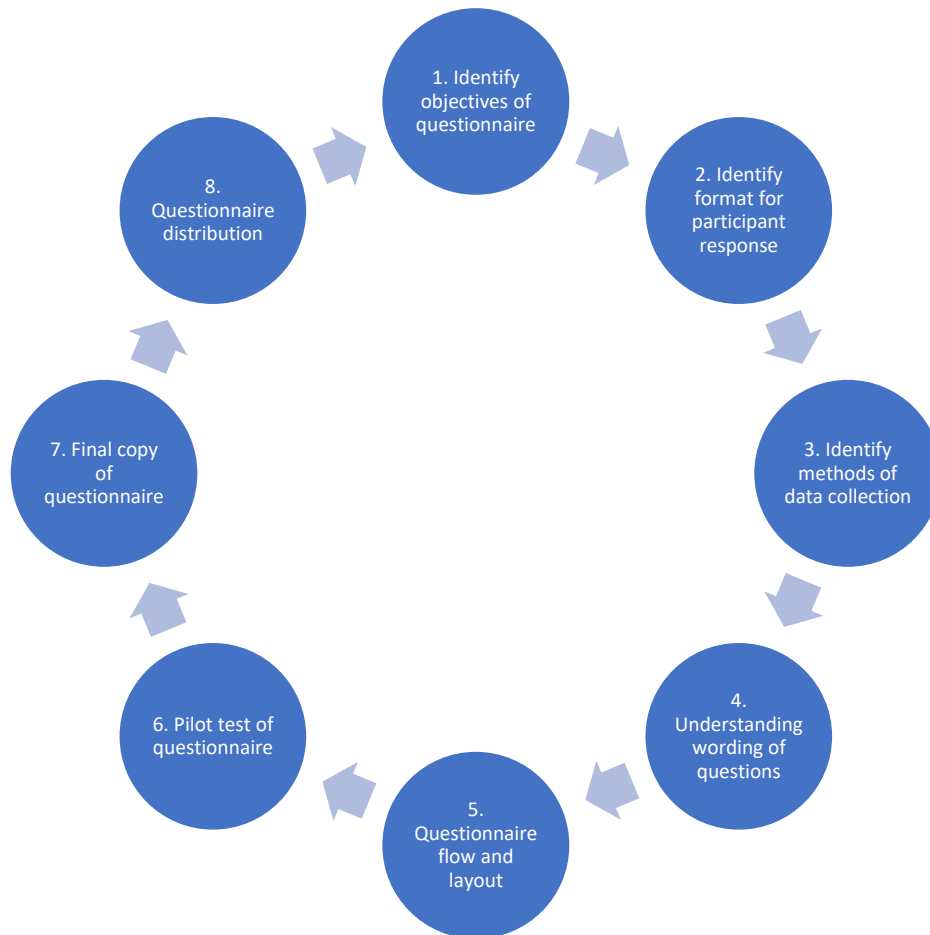


Figure 6-1 Process of designing a questionnaire for a quantitative study

Moreover, McDaniel and Gates (2006) suggested that designing and developing a study questionnaire includes several logical steps that could vary somewhat from research theme to research theme dependent on the proposed research nature. Figure 6-1 shows the series of steps that were taken to design and develop the questionnaire for this study. The following provides more detailed information on the process of questionnaire development and design.

Step 1 - identify objectives of the questionnaire, which is to prioritise the four patterns (strategic alignment, structural alignment, social alignment and cultural) of alignment and their related sub-factors so that the effectiveness of eGovernment in Saudi Arabia can be measured. The quantitative method was used to collect data and the factors were ranked based on mathematical mean value and pattern matrix. Step 2 - a nominal scale in SPSS was used for questions related to descriptive data, such as a participant's personal data and their company background. All question formats and the participants' responses were discussed and any issue which arose in relation to the format was explored with the two quantitative experts.

Step 3 - identify the methods for data collection, the key objective of the process of data collection being to derive opinions and information regarding the study questions from the selected study participants (Cooper and Schindler, 2003). Also, choosing the most suitable method of data collection is important to approach required study participants and acquire adequate and accurate information to answer the study questions (Saunders, et al., 2009). In order to collect data from busy eGovernment users, an online questionnaire was deemed useful for this study. Step 4 - understanding the wording of the questions, as the wording of each question requires careful consideration to ensure the participants responses are valid and can be measured, for example what is intended to measure the question (Saunders, et al., 2009). This questionnaire was not a traditional questionnaire. In this study, the wording of the questions was considered very important and the questions were kept simple and brief to avoid vagueness. To ensure the usefulness of the study questions, the

factors used in the questions were extracted from the literature review and all the questions were discussed with the eGovernment and alignment experts.

Step 5 - questionnaire flow and layout is based on an online standard and was tested in numerous industry areas for a couple of months (Saaty and Vargas, 2013). For this study, we make sure the instructions on how to fill in the questionnaire are clear and placed in the respective sections of the questionnaire and all the questions were aligned logically. Step 6 – the pilot test for the questionnaire was conducted after a detailed revision of the study questionnaire had been undertaken, to eliminate errors and to make sure the questions are relevant and are connected logically. The pilot test was conducted online through SurveyMonkey and was distributed to 40 participants, 20 being PhD students, 8 being academics and 12 being eGovernment practitioners. The results of the pilot study are not included in the data collection.

Step 7 - final copy of the questionnaire is obtained, based on the pilot study results. The questionnaire revisions were made in the context of the following points: the instructions on how to fill in questionnaire were updated, five questions were paraphrased and one question was deleted based on the pilot results. This step helps to prepare the final copy of the questionnaire. Moreover, a suitable time to complete the questionnaire was identified, the average time being between 30 and 40 minutes. Step 8 -the questionnaire was distributed by being posted online on SurveyMonkey and the potential study participants were contacted via social media channels like Facebook, LinkedIn and through the Ministry of eGovernment in Saudi Arabia.

6.2.2. Sampling techniques

The sampling techniques in a quantitative study deliver a range of research methods which permit investigators to minimise the information/data they collect from any group rather than collecting data from all possible cases (Saunders, et al., 2009). In this research, the investigator collected data from eGovernment users in the Kingdom of Saudi Arabia. As there is no reliable or formal data on the topic of alignment and eGovernment, a the data sample were chosen in a non-random style, where the non-probability method of a sampling technique was used. It is not feasible to collect data from the entire population of the country for the following reasons: limited time for the research, limited budget for the research, people's availability and government restrictions. The self-selection sampling technique is a non-probability sampling technique in which study participants are permitted to identify their own desire to participate in the study (Sekaran and Bougie, 2009). The snowball sampling technique is a non-probability technique in which subsequent respondents are obtained from information provided by initial respondents (Oates, 2006). The snowball sampling technique is one where the study participants are identified by the researchers based on the information available on social and professional medias (Oates, 2006). In this study, we used self-selection sampling and the snowball sampling technique to approach the participants. Participants were asked to identify other qualified people to participate in the study where possible and to forward the invitation via email and social media.

The study questionnaire was posted via SurveyMonkey and eGovernment users were approached via email and on their professional media accounts. A total of 140

participants were approached through Facebook and LinkedIn and 160 were approached through email (we obtained the eGovernment users' email addresses from the Ministry of eGovernment in Saudi Arabia). However, only 250 people agreed to participate in the study. The questionnaire link and other related information was sent to the study participants.

6.2.3. Preliminary stage of data analysis

The preliminary stage of data analysis involved choosing the most suitable data analysis strategy to ensure the data were clean and for data screening and pre-coding the study responses (Creswell and Creswell, 2017; Creswell, 2009; Morse, 2003). In this study, numeric values were allocated to each factor in the questionnaire for pre-coding process, and the latest version (25) of the statistical analysis tool and software package (SPSS) was employed when the study data were downloaded from Survey Monkey in a Microsoft Excel format. Following this, the data were transferred into SPSS for further analysis. The second step involved examination of the study data for normal distribution, data accuracy, missing values in the data and outliers through the cleaning and screening processes.

6.2.4. Data cleaning and screening

Data cleaning and screening were important stages in this study to ensure the data analysis process is not adversely influenced by poor quality data which will impact the study's outcomes, for example, if there are missing values or if the data has not been checked for inconsistencies. For this study, it was essential to alter the text responses for question 3 "Please specify the eGovernment services you use" to numeric values.

The question asks about eGovernment services used by the participants, such as eHealth, eTax, student loans, family tax benefits and Interior Ministry e-services, after which any missing data needs to be identified, so every factor was exposed to frequency examinations. This resulted in 56 responses revealing missing data, therefore, these 56 responses were not included in the study and 200 responses were further filtered to identify the respondents who have never used eGovernment services before. The response from the participants who have never used eGovernment services were removed from further analysis, which amounted to around 21% of the total response rate in the study. According to Malhotra (1999), the process of removing missing values or data is a procedure of casewise deletion. Therefore, 200 completed responses were considered to be practical for further analysis in this study, which is an acceptable number of responses for quantitative research.

6.2.5. Data outliers

Data outliers are defined as responses which are significantly different in some way. This is a vital influencing factor as the result of the study analysis might present a bias to the assumed framework, as outliers might generate bias for the statistics mean value and increase the statistical standard deviation (Oster, 1999; Marsh, et al., 1988; Krishnaiah, et al., 1980). In the case of data normality, the study data might have been influenced through outliers when assuming critical expectations from the adaptation of a statistical regression test. Therefore, the study data were cleaned and screened using a method called Z scores, a histogram graph with a box-plot graph to identify and expose outliers (Caiet, et al., 2019). This is all dependent on the number of cases within one group of data or pattern, whereupon the outlier's classification is resolved to be univariate or multivariate.

Moreover, two sections in the questionnaire are assumed to categorise outliers dependent on the circulation of the factors, failure to identify missing data and incorrect data entries (Wirtz and Daiser, 2018; Ravishankar, et al., 2011; Zowghi and Jin, 2010; Hair, et al., 2006; Flora and Curran, 2004). It is only possible to solve the outlier problem by altering the score, altering the data or removing the cases, and for this study, histogram graphs and box-plot graphs were used to graph the study data so that outliers might be identified more clearly. According to Field, (2013) a statistical process has been broadly employed and is chosen for this research, which includes measuring the statistical standard deviation from the statistical mean value. Tabachnick and Fidell (2007) recommend that responses might be examined with standardised scores that should be above 3.0 on a 5-point Likert scale.

The outliers exposed in this research were distributed by altering the study data, therefore the acceptance of eGovernment services could be recoded. Thus, the statistical mean value involved the mean value of high loaded sub-factors of any factor or alignment pattern when using the result from the factor analysis test. Despite the data transformation, the outliers are anticipated in this study, as it endeavours to assess the behaviour of Saudi Arabia citizens regarding their adoption of technology in relation to their use of eGovernment services.

6.2.6. Data normality

Two elements, namely average and variance, outline the normal distribution which is typically characterized as a symmetrical curve. For example, Field (2009) defines a symmetrical curve as a distribution of data around the central point of all ranks. Before

conducting statistical tests such as multivariate analysis, normal distribution or regression tests, it is important to analyse the data in terms of normal distribution. The histogram graph and quantile-quantile plots (QQ plots) show that research data should have normal distribution on both sides of the curved line in QQ plots and the histogram graph. For example, according to Hair et al. (2006), the results of a QQ plot and a histogram graph support the hypothesis that data is normally distributed with a large sample data size. To further understand a normal data distribution, some researchers suggest that it could be subject to bias and this judgement varies from researcher to researcher. The graph itself cannot provide definite evidence for the research outcomes (Hair, et al., 2006).

Thus, for each alignment factor included in this research, values obtained from a kurtosis and skewness test were assessed to provide authorization of the data's normal distribution (Hair, et al., 2006). Moreover, in the kurtosis and skewness test, the data symmetry might be skewed on the left side of the tail pointing towards the right side of the tail, which means this is a positive skew. However, if data symmetry is skewed on the right side of the tail and pointing towards the left side of the tail, this means it is a negative skew. For comparison, peakedness identifies and measures the median around the central value. A standard measure of peakedness is kurtosis, which is a degree of peakedness of a likelihood distribution. Consequently, in the case of a zero value from kurtosis and skewness, this means that the study data is distributed normally.

However, normality decreases depending on whether the value from the kurtosis and skewness test is positive or negative (Hair, et al., 2006). In this research, we applied

skewness on four different patterns of alignment (strategic, structure, social and cultural) and the results indicate that in all four patterns, the value of skewness is negative and the normal distribution of data is towards the right. Figures 6-2, 6-3, 6-4, 6-5 and 6-6 show the skewness results, which indicates that in KSA, eGovernment users understand the importance of alignment and they recommended the government to align the eGovernment infrastructure so that eGovernment services can be improved.

6.2.7. Descriptive statistics data

Tabachnick and Fidell (2007) describe the study factors or combination of sub-factors that can be employed to describe the subject sample which can then be defined as a descriptive statistic. Thus, a graphical form of data analysis, such as tables or charts, are often employed to demonstrate compact forms of summarised study data taken from numerous statistical tests and produce results in the form of standard deviation, mean value, mode value, statistical frequency and percentage. For this research, these descriptive analyses are demonstrated in order to identify the participants' location, age and their relationship with the acceptance of eGovernment services provided in KSA and the importance of alignment to the provision of quality eGovernment services.

In order to identify and confirm the study's hypotheses, descriptive data analysis contributes to describing uncertainties in raw data (Hair, et al., 2006). The following section examines some descriptive statistics prior to the advanced data analysis, for example factor analysis, a regression test and confirmatory factor analysis (CFA). The literature review indicates that in the KSA, eGovernment users lack ICT skills, which

results in them having a lack of knowledge on how to use eGovernment services and how alignment between government agencies and IS departments can help to improve eGovernment services' quality. This study evaluates the following five points: which KSA city has the most eGovernment services users; the age range of Saudis using eGovernment services; which eGovernment services do Saudi people like to use or feel comfortable using; what is the level of satisfaction of Saudi people regarding current eGovernment services and to what extent is the alignment between government agencies and IS departments important in relation to the quality of eGovernment services.

6.2.8. Confirmatory factor analysis

Confirmatory factor analysis (CFA) is a statistical method that is employed to confirm the structure of a factor for the pattern of observed study variables (Brown, 2014; Birch, et al., 2001; Marsh and Hocevar, 1985; Anderson and Gerbing, 1984). CFA permits the investigator to examine the research hypothesis that an association between the observed study factors and their primary latent paradigms exists (Flora and Curran, 2004; Marsh, et al., 1988; Anderson and Gerbing, 1984). The investigator uses empirical research, knowledge of the theory, or sometimes both, and assumes the association pattern a priori and then examines the hypothesis statistically.

Punch (2003) recognized three strategies for quantitative study data analysis as follows: 1) creating study factors; 2) allocating factors across the data sample and 3) generating associations. The SPSS software tool and its complement called AMOS version 6.3.1 were identified to be the most appropriate software for analysing and

examining the quantitative study data due to their ability to examine and model latent factors for data screening, cleaning and analysis.

In AMOS, structural equation modelling (SEM) was employed to identify the associations among study factors and their fit into the study framework (Hair, et al., 2006). CFA in this research was employed to assess the multi-dimensionality and the validity of the factors of the concepts of the theoretical framework (Byrne, 2001). According to Hair et al. (2006), the quantitative study SEM analysis procedure comprises two steps: 1) the analysis of the measurement model, and 2) the analysis of the structural model. SEM can be implemented through various software tools such as AMOS, EQS, and LISREL. In this research, we used AMOS to implement SEM.

6.3. Quantitative data analysis

Data analysis is the process of exploring, classifying, otherwise recombining the composed study raw data with the aim of calculating the answer to the proposed study questions (Creswell and Creswell, 2017; Creswell, 2009; Morse, 2003; Mingers and Brocklesby, 1997). This chapter presents the quantitative data analysis to develop an understanding of eGovernment services adoption among users, as well as to identify the eGovernment services users' point of view.

6.4. Quantitative data analysis results

This study discusses the ideal pattern of alignment in the context of eGovernment services in the KSA region. There are four patterns of alignment and each includes sub-factors of the domain. This section discusses the data analysis results.

6.4.1. Demographic profile

The demographic profile was constructed in the first question of the survey questionnaire which indicates the participants' location in the KSA. Table 6-1 shows that the survey respondents were from 11 cities in KSA. Of the 200 responses, 10% of the participants were from Riyadh; 10.5% of the participants were from Jeddah; 10% of the participants were from Mecca; 10% of the participants were from Medina; 12.5% of the participants were from Buraidah; 10.5% of the participants were from Dammam; 12.5% of the participants were from Tabuk; 6% of the participants were from Khobar; 7.5% of the participants were from Unzizah; 10% of the participants were from Taif and 0.5% were from other cities in the KSA.

Table 6-1: Respondents' city of residency

| Participants' city of residence | | | | |
|--|------------------|----------------|----------------------|---------------------------|
| City | Frequency | Percent | Valid Percent | Cumulative Percent |
| Buraidah | 25 | 12.5 | 12.5 | 12.5 |
| Dammam | 21 | 10.5 | 10.5 | 23.0 |
| Jeddah | 21 | 10.5 | 10.5 | 33.5 |
| Khobar | 12 | 6.0 | 6.0 | 39.5 |
| Mecca | 20 | 10.0 | 10.0 | 49.5 |
| Medina | 20 | 10.0 | 10.0 | 59.5 |
| other | 1 | .5 | .5 | 60.0 |
| Riyadh | 20 | 10.0 | 10.0 | 70.0 |
| Tabuk | 25 | 12.5 | 12.5 | 82.5 |
| Taif | 20 | 10.0 | 10.0 | 92.5 |
| Unzizah | 15 | 7.5 | 7.5 | 100.0 |
| Total | 200 | 100.0 | 100.0 | |

This result indicates that the government of Saudi Arabia is more aware of eGovernment users in larger cities compared to smaller cities. Consequently, more

eGovernment users from the larger cities like Riyadh, Jeddah, Mecca, Medina, Buraidah, Dammam and Tabuk participated in this study. Only a few participants were from smaller cities like Khobar, Unzizah and Taif.

Table 6-2: Respondents' age

| Study participants' age | | | | |
|--------------------------------|------------------|----------------|----------------------|---------------------------|
| Participants' age range | Frequency | Percent | Valid Percent | Cumulative Percent |
| 18- 28 years | 31 | 15.5 | 15.5 | 15.5 |
| 29-39 years | 61 | 30.5 | 30.5 | 46.0 |
| 39-49 years | 65 | 32.5 | 32.5 | 78.5 |
| 50-60 years | 29 | 14.5 | 14.5 | 93.0 |
| 61-over | 14 | 7.0 | 7.0 | 100.0 |
| Total | 200 | 100.0 | 100.0 | |

The demographic profile was also constructed in the second question of the survey questionnaire which indicated the participants' age range. Table 6-2 shows the results. We can see from Table 6.2 that 15.5% of the participants were aged between 18 and 28 years; 30.5% were aged between 29 and 39 years; 32.5% were aged between 39 and 49 years; 14.5% were aged between 50 and 60 years and 7% were aged over 61 years.

The demographic profile was also constructed in the third question of the survey questionnaire which asked the participants to indicate the eGovernment services they used. Table 6-3 shows the survey results that in KSA, 21.5% of participants use eHealth services; 19.5% of the participants use eTax services; 19.5% of the participants use student loan services; 23% of the participants use family tax benefits services and 16.5% of the participants use Interior Ministry e-services. Moreover, 41% of the participants stated that they mostly use eHealth services; they only used a

student loan service once and only sometimes used eTax services. 35% of the participants stated that they often use family tax benefits services and sometimes they use a student loan services; 24% of the participants stated that they often use the Interior Ministry e-services and sometimes use eHealth services.

Table 6-3: eGovernment services used by respondents

| eGovernment services used by participants | | | | |
|--|------------------|----------------|----------------------|---------------------------|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| eHealth | 43 | 21.5 | 21.5 | 21.5 |
| eTax | 39 | 19.5 | 19.5 | 41.0 |
| Family tax benefits | 46 | 23.0 | 23.0 | 64.0 |
| Interior Ministry e-services | 33 | 16.5 | 16.5 | 80.5 |
| Student loan | 39 | 19.5 | 19.5 | 100.0 |
| Total | 200 | 100.0 | 100.0 | |

In the fourth question, we asked the eGovernment users about their satisfaction regarding the eGovernment services they use. Table 6-4 shows the survey results where 95.5% of the study participants are not satisfied with the eGovernment services they use. In this group, the participants are university graduates and they have knowledge of the importance of information technology. The participants in this group are 18 years to 39 years old. However, only 4.5% of participants are satisfied with the eGovernment services provided by the KSA government. The users in this group are characterised by a lack of knowledge of information technology.

Table 6-4: Respondents' satisfaction with eGovernment services

| User satisfaction with eGovernment services | | | | |
|--|------------------|----------------|----------------------|---------------------------|
| User satisfaction with eGovernment services | Frequency | Percent | Valid Percent | Cumulative Percent |
| Yes | 9 | 4.5 | 4.5 | 4.5 |
| No | 191 | 95.5 | 95.5 | 100 |

6.4.2. Importance of alignment in the eGovernment sector in KSA

The term alignment between government agencies and IS refers to harmony between both the sectors. It indicates the capability to use IS successfully in order to improve eGovernment governance; structure; social aspects; culture; financial performance and overall services. eGovernment agencies and the IS department are typically seen as two distinct entities that work together to achieve eGovernment goals and objectives effectively.

To develop an understanding of alignment and eGovernment acceptance and its importance in this study, in the fifth question of the survey questionnaire, the participants were asked about the importance of alignment between government agencies and IS departments and why this alignment is important for the eGovernment sector in KSA.

Figure 6-2 indicates that of the 200 participants, 65.5% strongly agreed that alignment is the only solution to ensure high-quality eGovernment services; 28.5% agreed on alignment importance; 3% were neutral; 1% disagreed and 2% think alignment is not important at all and chose strongly disagree.

However, the IS department in the eGovernment sector should receive the same attention as other areas of eGovernment and IS strategy should be integrated with the

business strategy. In the KSA, the IS department is viewed as a distinct component of eGovernment which is necessarily affiliated with the eGovernment's goals in the same way that numerous other KSA government sectors still operate. Therefore, the IS department in the KSA must be an essential and integral element of the eGovernment in the KSA, not a distinct department. After all, it is important to note that it is the IS department which facilitates an eGovernment in the KSA and consequently provides strategic benefits to the government.

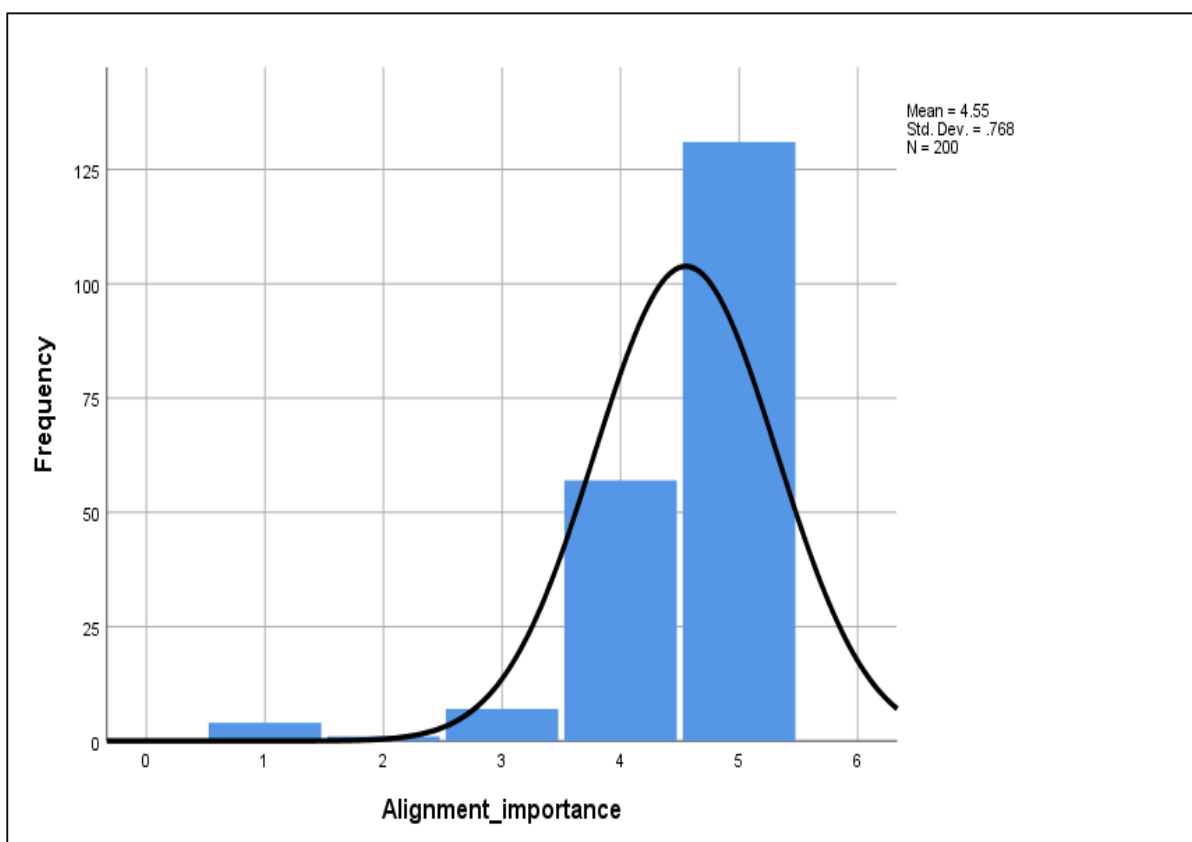


Figure 6-2. Importance of alignment among eGovernment users

In section 2 of the questionnaire, the participants were asked to rank the importance of alignment in the context of eGovernment in the KSA. A 5-point Likert scale was used to measure the respondents' opinions regarding the importance of alignment in

the context of eGovernment in the KSA, where 1 means “Strongly Disagree”, 2 means “Disagree”, 3 means “Neutral”, 4 means “Agree” and 5 means “Strongly Agree”.

The mean score for the ‘alignment improved communication levels within eGovernment organizations’ ranged between 4.39 and 5.0, as shown in Table 6-5. This means eGovernment users in the KSA believe that to provide eGovernment services at all levels of the eGovernment structure, alignment is important, and it helps to understand every stakeholder in the sector. The mean score for the factor of ‘alignment improved communication between business and IS executives’ in the eGovernment sector ranged between 4.47 and 5.0. This means that eGovernment users in the KSA believe that better communication channels between senior management and their teams is only possible through successful alignment, so that they can guide and manage their team.

Table 6-5: Importance of alignment in the eGovernment sector

| Factors | 1 | 2 | 3 | 4 | 5 | Mean |
|---|--------------------------|-----------------|----------------|----------------|-----------------------|-------------|
| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | |
| Improved communication level within the eGovernment organizations | 0 (0%) | 0 (0%) | 9 (4.5%) | 105 (52.5%) | 86 (43%) | 4.39 |
| Improved communication between business and IS executives | 0 (0%) | 0 (0%) | 7 (3.5%) | 92 (46%) | 101 (50.5%) | 4.47 |
| Support of informal business and IS structures | 0 (0%) | 0 (0%) | 10 (5.0%) | 79 (39.5%) | 111 (55.5%) | 4.52 |
| Support of informal business and IS strategy | 0 (0%) | 1 (0.5%) | 12 (6.0%) | 76 (38.0%) | 111 (55.5%) | 4.49 |
| Improved management skills among IS staff | 0 (0%) | 0 (0%) | 14 (7.0%) | 81 (40.5%) | 105 (52.5%) | 4.46 |

| | | | | | | |
|--|-----------|-------------|--------------|---------------|----------------|------|
| Improved use of IS within the eGovernment organizations | 0 (0%) | 0 (0%) | 15 (7.5%) | 89 (44.5%) | 96 (48.0%) | 4.41 |
| Improved performance of business managers | 0 (0%) | 0 (0%) | 12 (6.0%) | 59 (29.5%) | 129 (64.5%) | 4.59 |
| Improved Government revenue | 0 (0%) | 0 (0%) | 14 (7.0%) | 60 (30.0%) | 126 (%63.0) | 4.56 |
| Reduction in the IS investment cost | 0 (0%) | 0 (0%) | 14 (7.0%) | 69 (34.5%) | 117 (58.5%) | 4.52 |
| Reduction in the overall investment cost | 0 (0%) | 0 (0%) | 12 (6.0%) | 68 (34.0%) | 120 (60.0%) | 4.54 |
| An increase the eGovernment organizations product quality | 0 (0%) | 0 (0%) | 10 (5.0%) | 82 (41.0%) | 108 (54.0%) | 4.49 |
| A positive influence on the IS belief of business executives and managers. | 0 (0%) | 1 (0.5%) | 16 (8.0%) | 74 (37.0%) | 109 (54.5%) | 4.46 |

The mean score for the factor 'alignment support of informal business and IS structures' ranged between 4.52 and 5.0. This indicates that eGovernment users in the KSA believe that there is a structural difference between eGovernment agencies and the IS department and that to minimize this gap, both sectors should be aligned. The mean score for the 'alignment supports informal business and IS strategy' factor ranged between 4.49 and 5.0. This means that eGovernment users in the KSA believe that the eGovernment strategy in the KSA is formal and to gain approval for any new projects involves a lengthy and time-consuming application procedure. This impacts negatively on the overall performance of the eGovernment. Therefore, alignment is important in supporting the informal relationship between the IS department and other eGovernment agencies.

The mean value for the factor 'alignment improves management skills among IS staff' ranged between 4.48 and 5.0. This means that eGovernment users in the KSA confirm that IS department staff in the eGovernment sector lack management skills which results in their misunderstanding the requirements of the other agencies in the eGovernment sector. However, this can be improved through strong alignment in the sector. The mean score for the 'alignment improves the use of IS within the eGovernment organizations' factor ranged between 4.41 and 5.0. This indicates that eGovernment users in the KSA confirm that staff in many public departments still have a lack of understanding of IS, which limits their ability to provide effective services to citizens.

The mean value for the factor of 'alignment improved performance of business managers' ranged between 4.59 and 5.0. This means that eGovernment users in the KSA believe that managers or supervisors in the eGovernment sector should speak the same language, as in the eGovernment sector, staff are multi-national and alignment could help to resolve cultural issues. The mean score for the factor of 'alignment improves eGovernment revenue' ranged between 4.59 and 5.0. This means that eGovernment users in the KSA believe that if all agencies and staff members are aligned with each other, this could improve eGovernment revenue. The mean value for the factors of 'alignment reduces the IS investment cost' and 'reduction in the overall investment cost' ranged between 4.52 and 5.0 and between 4.54 and 5.0. This means that eGovernment users in the KSA believe that the government spends a significant proportion of its budget on the IS department so that it can support other departments technically, however, the reality is that different IS departments are not able to support sectors effectively and the exact IS budget is unknown.

The mean score for the factor of 'alignment increases the eGovernment organizations product quality' ranged between 4.49 and 5.0. This means that eGovernment users in the KSA believe that alignment is very important for the quality of eGovernment services, as 95.5% of participants in this study stated that they were not satisfied with current eGovernment services in the KSA. The mean score for the factor of 'alignment has a positive influence on the IS belief of business executives and managers' ranged between 4.46 and 5.0. This means that eGovernment users in the KSA believe that alignment can establish strong relationships at the executive and managerial level and helps to build their trust in IS.

[6.4.3. Importance of alignment patterns in eGovernment infrastructure](#)

Before analysing the reliability of alignment patterns, it is important to understand the eGovernment services users' opinions regarding each pattern of alignment. This study applied a skewness test on all four patterns of alignment separately and the results show that for all four patterns, the value of skewness is negative (Hair, et al., 2006) and the normal distribution of data is towards the right side of the histogram graph. This means that in the KSA, eGovernment users understand the importance of alignment and they recommend that the government aligns with the eGovernment infrastructure so that eGovernment services can be improved.

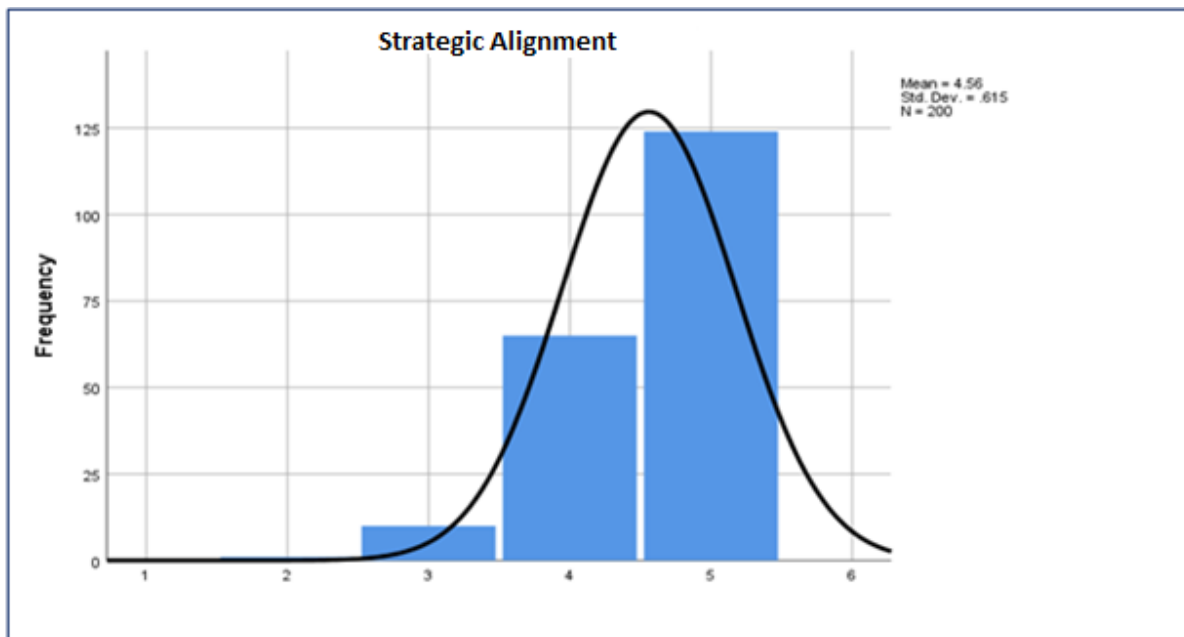


Figure 6-3. Importance of strategic alignment in the KSA

In the questionnaire, the participants were asked to rank the importance of strategic alignment. The result of skewness in Figure 6-3 (ranked between 4 and 5 on the 5-point Likert scale) indicates that in the KSA, eGovernment users understand the importance of strategic alignment, therefore they highly recommend that the government of the KSA strategically aligns with the eGovernment infrastructure. If organizations' senior management is not aligned strategically, then it is not possible to serve the public effectively.

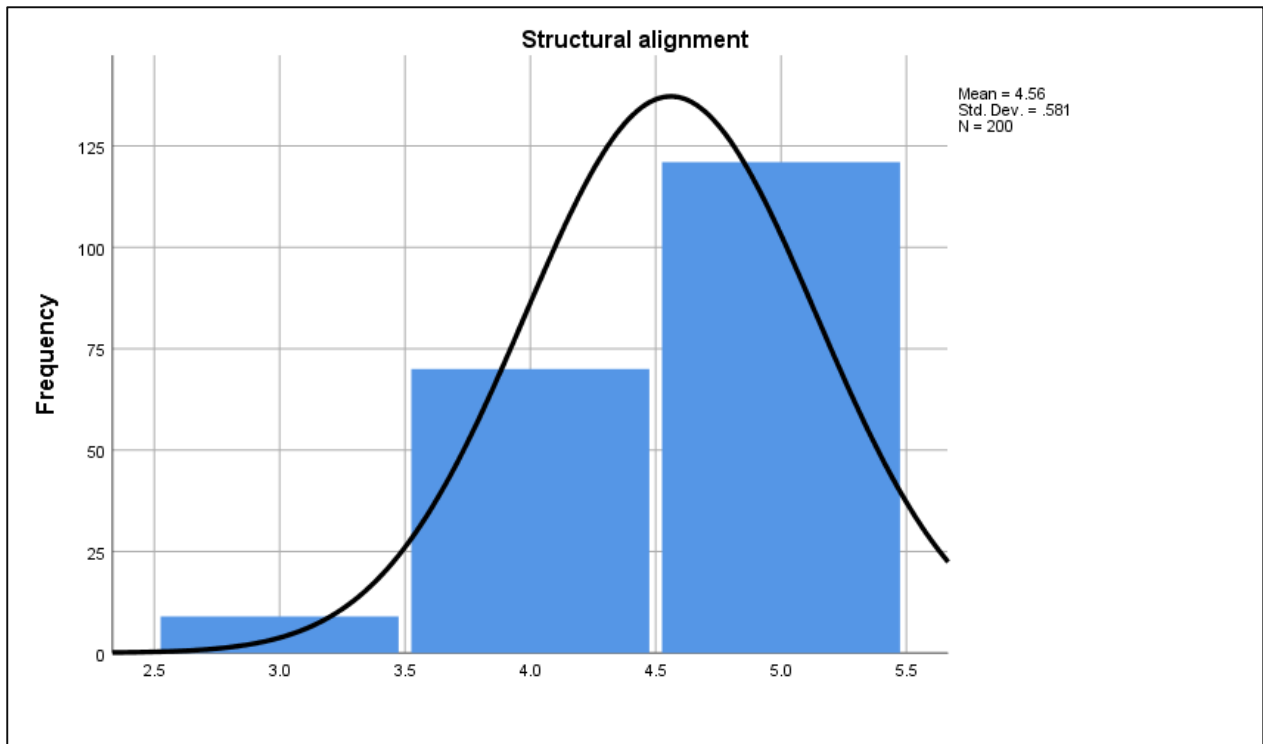


Figure 6-4. Importance of structural alignment in the KSA

An eGovernment structure is a system that plans how certain government activities are undertaken in order to achieve the government's goals and objectives. These activities might include government responsibilities, roles and rules. The eGovernment structure also regulates how information flows from one level to another within the eGovernment boundary. The participants were asked to rank the importance of structural alignment. The result of skewness in Figure 6-4 (ranked between 4 and 5 on the 5-point Likert scale) indicates that in the KSA, eGovernment users understand the importance of structural alignment, therefore, they highly recommend that the government of the KSA structurally aligns itself with the eGovernment infrastructure. In the KSA, the eGovernment structure is divided into many levels, and each level must align with each other to provide better eGovernment services.

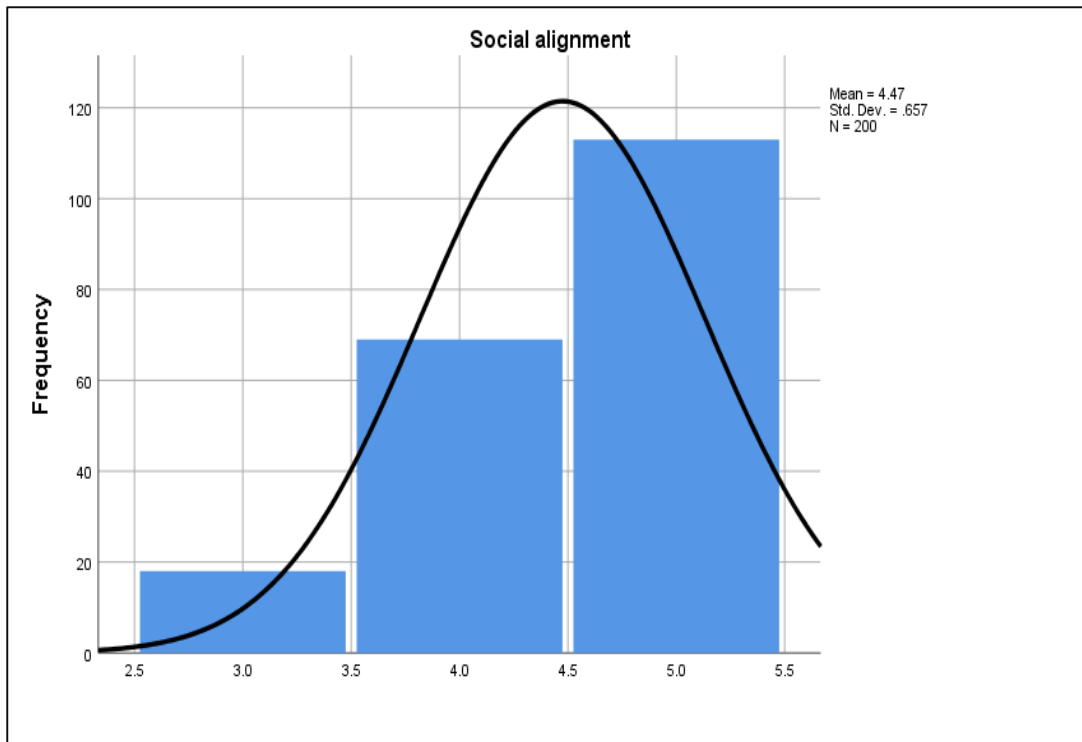


Figure 6-5. Importance of social alignment in the KSA

The participants were asked to rank the importance of social alignment. The result of skewness in Figure 6-5 (ranked between 4 and 5 on the 5-point Likert scale) indicates that in the KSA, eGovernment users understand the importance of social alignment, consequently, they strongly endorsed the government’s social alignment with the eGovernment infrastructure. They highlighted that social factors in the eGovernment structure have become an essential part of its efforts to gain greater public support and economic returns from non-government sectors.

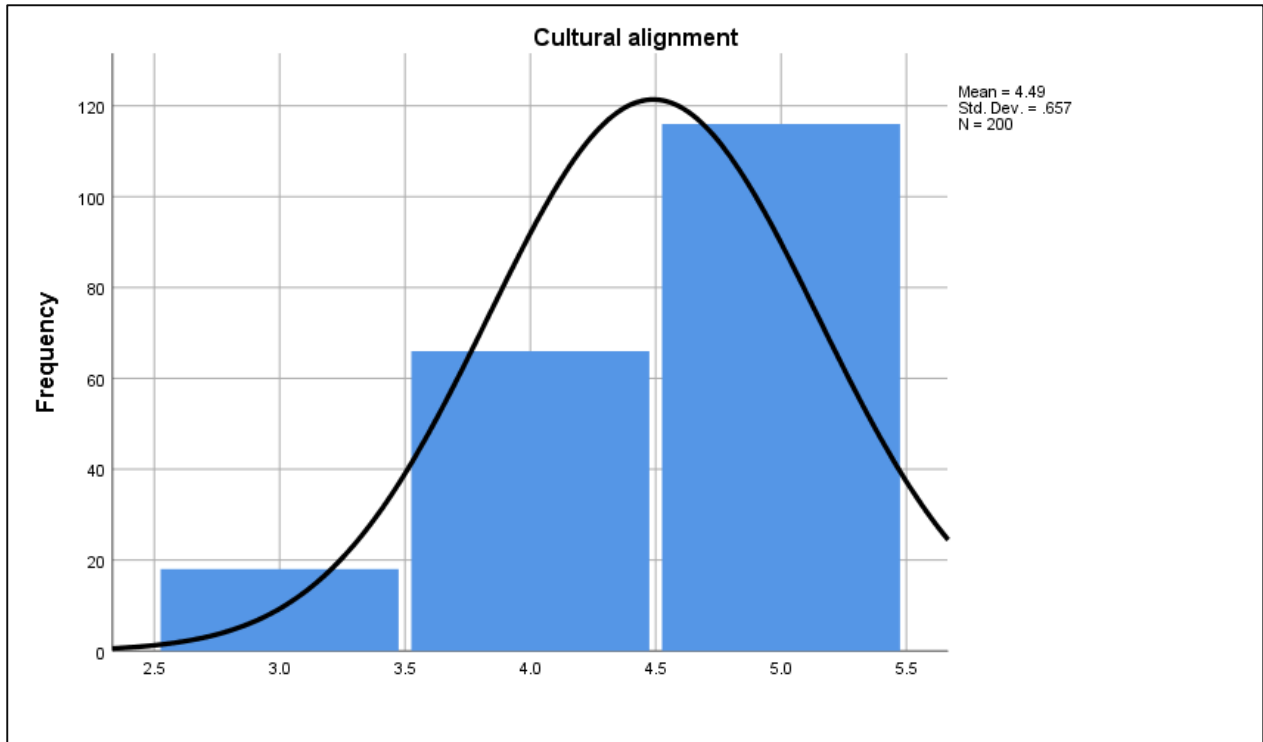


Figure 6-6. Importance of cultural alignment in the KSA

An eGovernment culture is defined as the organization’s primary beliefs, values, assumptions and ways of interrelating that contribute to the unique social and psychological environment of an eGovernment. An eGovernment’s culture comprises its experiences, expectations, philosophy, and values to guide staff members and staff relationships inside and outside the eGovernment structure. In the KSA, the eGovernment culture is based on beliefs, shared attitudes, customs, written and unwritten rules that develop over time. In the questionnaire, the study participants were asked to rank the importance of cultural alignment. The result of skewness in Figure 6-6 (ranked between 4 and 5 on the 5-point Likert scale) indicates that in the KSA, eGovernment users understand the importance of cultural alignment, therefore, they highly recommend that the government of the KSA culturally aligns itself with the eGovernment infrastructure.

6.4.4. Alignment pattern reliability

Four patterns of alignment in the context of eGovernment have been identified from the literature and the sub-factors in each alignment pattern have been identified and validated by eGovernment experts. This section presents the evaluation of each alignment pattern and their sub-factors by eGovernment users in the KSA.

The quantitative method requires that instruments are assessed in relation to their reliability and validity, therefore a detailed evaluation of the collected data is required to identify any insufficiencies or errors and therefore ensure accurate measurements, thus the investigator can be assured of the measurement's accuracy. According to Hair et al. (2006) and Field (2013), reliability testing refers to 'whether data can be understood continually across different circumstances'. In this case, reliability can be defined as the overall consistency of a measure, so investigation findings are verified if the data result is repeated. Bryman (2008) defines two forms of reliability: the first form of reliability ensures the measure is stable over time and does not fluctuate; the second form of reliability is internal reliability which checks whether the scale indicators are steady. This form of reliability is used by splitting the study data into two, and the participants scores are considered for each half and the statistical correlation is then checked.

Moreover, many researchers suggested conducting the Cronbach alpha test which was proposed by Cronbach in 1951. In this test, the data is split and the correlation coefficient for every split data is calculated. The literature defines an adequate level of the Cronbach's alpha is a measure of the internal consistency of a test or scale and is expressed as a number between 0 and 1. According to Hair et al. (2006) a coefficient value of 0.7 is excellent for inner reliability. However, Pallant (2001) argues that the coefficient value should be 0.6 to claim good inner reliability . Hinton et al. (2004) suggested four levels of reliability: a coefficient value of 0.5 and below is considered low, a coefficient value of between 0.5 and 0.7 is considered moderate, a coefficient value between 0.7 and 0.9 is considered high and a coefficient value between 0.9 and above is considered excellent.

Table 6-6: Reliability statistics for the model

| Reliability Statistics | | |
|-------------------------------|--|------------|
| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
| 0.773 | 0.775 | 19 |

This study conducted the Cronbach alpha test to measure inner reliability, the results of which showed a value of 0.773, as shown in Table 6-6, indicating high internal reliability.

Inner consistency was also employed to calculate the reliability concerning the identification of the ideal pattern of alignment in the context of the eGovernment sector, (Hinton, et al., 2004). Table 6-7 shows the Cronbach's alpha values for the ideal patterns of alignment for each pattern or for each construct. The results show the reliability of the scale indicators, the consistency of the study data and the homogeneity of the ideal pattern of alignment.

Table 6-7: Cronbach's Alpha for the model constructs

| Reliability Statistics for Constructs | | |
|--|------------------|------------|
| Model constructs | Cronbach's Alpha | N of Items |
| Alignment pattern 1: Strategic | 0.701 | 5 |
| Alignment pattern 2: Structure | 0.713 | 5 |
| Alignment pattern 3: Social | 0.691 | 4 |
| Alignment pattern 4: Cultural | 0.711 | 5 |

6.4.4.1. *Validity test for reliability identification*

While the data from respondents might be reliable, low validity is exposed if the study does not evaluate and measure what was projected, consequently the study's outcomes might be useless. Hence, if the study data is not reliable, the study data is not valid. According to Bryman, (2008), there are different methods to measure validity, namely, construct validity and content validity.

6.4.4.2. *Content and construct validity for reliability identification*

Content validity is also known as logical validity, which refers to the extent to which a measure denotes all the facets of a given construct. Straub et al. (2004) define content

validity as the degree to which the study factors in an instrument represent the content creation in which the study instrument will be generalised. In this context, the content of this study has been defined as face validity. Many investigators validate the study data by labelling the identified factors. In this research, before the final survey was designed, a pilot survey and pilot test were conducted. eGovernment experts reviewed the study survey and confirmed the validity of the content. For the construct validity, a method commonly used is factor analysis, which refers to the correlated factors loading, however, in this study, factor analysis and the correlation matrix test were employed to disclose the construct validity of this study.

6.4.5. Factor analysis (ideal pattern of alignment for eGovernment)

6.4.5.1. Confirmatory factor analysis (CFA)

eGovernment refers to the use of information and communication technologies to enhance the activities of citizens and public sector organizations. There are three domains of eGovernment, namely: improving eGovernment activities and processes, connecting citizens and building external interactions. Therefore, factor analysis is important, and this research implements CFA for the model fit and several statistical tests were used to determine how the proposed model fits to the study data (Bryman, 2008). In CFA, Model Fit Indices (SEM) are calculated as follows:

$$\text{SEM} \quad \chi^2 (\text{df}_h) = (\mathbf{n} - 1)F[\mathbf{S}, \Sigma(\hat{\theta})]$$

$$\text{ACI} \quad \text{ACI} = \chi_h^2 - 2df$$

$$\text{NFI} = \frac{\chi_i^2 - \chi_h^2}{\chi_i^2}$$

$$\text{NNFI} = \frac{\chi_i^2 / \text{df}_i - \chi_h^2 / \text{df}_h}{\chi_i^2 / \text{df}_i}$$

$$\text{GFI} = 1 - \frac{F[\mathbf{S}, \Sigma(\hat{\theta})]}{F[\mathbf{S}, \Sigma(\theta)_i]}$$

$$\text{AGFI} = 1 - \left(\frac{c}{\text{df}_h} \right) \frac{F[\mathbf{S}, \Sigma(\hat{\theta})]}{F[\mathbf{S}, \Sigma(\theta)_i]}$$

$$\text{RMSEA} = \sqrt{\frac{(\chi_h^2 / \text{df}_h) - 1}{n}}$$

In the above equations,

S represents the covariance matrix

$\Sigma(\theta)_h$ indicates the variance/covariance matrix indirectly through the study parameters

$\Sigma(\hat{\theta})_h$ refers to the variance/covariance matrix indirectly through the sample estimate parameters

C represent the number of covariances and variances

F indicates the maximum likelihood inconsistency function

χ^2 represents Chi square, associates the observed variance covariance matrix to the forecast variance covariance matrix, hypothetically ranges from 0 which means perfect fit and $+\infty$ which means a very poor fit, considered satisfactory when non-significant ($p > .05$).

AIC stands for Akaike Information Criterion, like χ^2 but adjusts for the model complexity, hypothetically ranges from negative ∞ which means perfect fit and positive ∞ which means very poor fit.

NFI stands for Normed Fit Index (EQS), hypothetically ranges from 0, which means poor fit and 1 which means perfect fit, considered satisfactory when (>0.90).

NNFI stands for Non-Normed Fit Index (EQS), hypothetically ranges from 0 which means poor fit and 1 which means perfect fit, considered satisfactory when (>0.90).

GFI stands for Goodness of Fit Index, hypothetically ranges from 0 which means poor fit and 1 which means perfect fit, considered satisfactory when (>0.90).

AGFI stands for Adjusted Goodness of Fit Index (LISREL), hypothetically ranges from 0 which means poor fit and 1 which means perfect fit, considered satisfactory when (>0.90).

RMSEA stands for Root Mean Square Error of Approximation, hypothetically ranges from 0 which means poor fit and 1 which means perfect fit, considered satisfactory when (<0.05).

Table 6-8: Standardized covariance

Standardized Residual Covariances (Group number 1 - Default model)

| | cu1_in vlov_I S | cu2_ com m | cu3_rela _workin g | cu4_IS_ maturity | cu5_Str_ leadership | so1_kn owledg e | so2_IS_ plannin g | so3_Exec relat | so4_IS_r ela_othe r | str1_eG overn_st r | str2_ IS_st r | str3_inf_c complexity | str4_IS _Suppo rt | str5_Fo rmaI_st r | stgy1_eG overn_stg y | stgy2_ IS_stg y | stgy3_eG overn_pla n | stgy4_IS_ Investmen t | stgy5_Unl lear_stg y |
|-----------------------------|-----------------------|------------------|--------------------------|---------------------|------------------------|-----------------------|-------------------------|-------------------|---------------------------|--------------------------|---------------------|--------------------------|-------------------------|-------------------------|----------------------------|-----------------------|----------------------------|-----------------------------|----------------------------|
| cu1_invol v_IS | .000 | | | | | | | | | | | | | | | | | | |
| cu2_com m | .227 | .000 | | | | | | | | | | | | | | | | | |
| cu3_rela_ working | -1.095 | .123 | .000 | | | | | | | | | | | | | | | | |
| cu4_IS_m aturity | -1.726 | -.045 | .501 | .000 | | | | | | | | | | | | | | | |
| cu5_Str_l eadrship | .406 | .199 | -1.420 | .289 | .000 | | | | | | | | | | | | | | |
| so1_know ledge | .355 | -.344 | -.295 | -.327 | -.435 | .000 | | | | | | | | | | | | | |
| so2_IS_pl anning | .121 | -.448 | .186 | -.373 | -1.236 | .395 | .000 | | | | | | | | | | | | |
| so3_Exec _relat | -.148 | .223 | .340 | .218 | -.203 | -.837 | .276 | .000 | | | | | | | | | | | |
| so4_IS_re la_othe r | .453 | -.388 | .531 | .547 | -1.203 | -.317 | -.372 | .320 | .000 | | | | | | | | | | |
| str1_eGov ern_str | .377 | -.866 | -1.321 | -1.250 | -.157 | .105 | -.763 | .231 | .306 | .000 | | | | | | | | | |
| str2_IS_st r | -.931 | -.214 | .339 | .105 | .446 | -1.038 | -.527 | .403 | .341 | .648 | .000 | | | | | | | | |
| str3_inf_c omplexity | -.982 | -.233 | .142 | .318 | -.849 | .249 | .037 | .022 | -.358 | .043 | -.150 | .000 | | | | | | | |
| str4_IS_S upport | .266 | .285 | .115 | -1.687 | .237 | -.765 | -.337 | -.407 | -.701 | -1.535 | -.602 | .370 | .000 | | | | | | |
| str5_Form al_str | .334 | .367 | .258 | -.267 | .082 | -1.146 | .392 | -.100 | -.550 | -1.181 | .382 | -1.005 | .085 | .000 | | | | | |
| stgy1_eG overn_stg y | .368 | .849 | -1.346 | -.422 | -.158 | .207 | -1.102 | -.535 | -.628 | .361 | -.455 | -.030 | -.323 | -1.979 | .000 | | | | |
| stgy2_IS_ stgy | -.609 | .393 | .269 | .777 | -.553 | -.999 | .299 | -.410 | .358 | .199 | .030 | .328 | -.693 | .302 | .089 | .000 | | | |
| stgy3_eG overn_pla n | .262 | -.672 | .221 | -.011 | -.711 | -.709 | .148 | -.465 | .378 | -.572 | .173 | -.878 | .332 | .080 | .313 | .292 | .000 | | |
| stgy4_IS_ Investmen t | -.332 | -.608 | .054 | .305 | .397 | .285 | -.242 | .386 | -.040 | .146 | .326 | .350 | .219 | -.805 | -.611 | -.694 | -1.004 | .000 | |
| stgy5_Unl lear_stgy | -.939 | .025 | -.955 | .424 | .124 | .319 | .292 | -.427 | .054 | .316 | .170 | .317 | -.073 | .359 | -.284 | -1.483 | -1.066 | .688 | .000 |

MacCallum et al. (1996) suggested that sample-size requirements for the RMSEA goodness of fit are by means of effect size and model degrees of freedom. A structural equation model was evaluated and tested to examine the study hypothesis in relation to the identification of an ideal pattern of alignment and the satisfaction of the KSA eGovernment user with their services. Both ideal pattern of alignment and eGovernment services satisfaction were latent variables in this proposed model.

The factor analysis results of our model fit are as follows: CMIN =5.098, GFI=0.910, CFI=0.988, PCLOSE=0.504 and RMSEA=0.03. This result indicates that our model is fit for the study hypothesis and the planned model. Moreover, the standardized covariance shown in Table 6-8 indicates that the study factors are interrelated to each other, most of the values in this test are equal or below (0.4), however only a few factors achieved a higher value than 0.4. This means those factors also have loaded with the other alignment patterns. SEM is a multivariate arithmetical analysis method that is employed to analyse structural relationships for the proposed research. This method is a mixture of multiple regression analysis and factor analysis and it is employed to analyse the structural relationship among latent constructs and measured variables. This method is favoured by the researcher as it evaluates the interrelated and multiple dependence in one form of analysis. In this research, we applied SEM and the model is presented in Figure 6-7 where each factor's score indicates their importance in relation to their parent factor, these being "Strategy", "Structure", "Social" and "Culture". Moreover, Figure 6-7 indicates that all four factors are

strongly correlated with each other which means that the proposed ideal pattern of alignment has a positive impact on eGovernment performance.

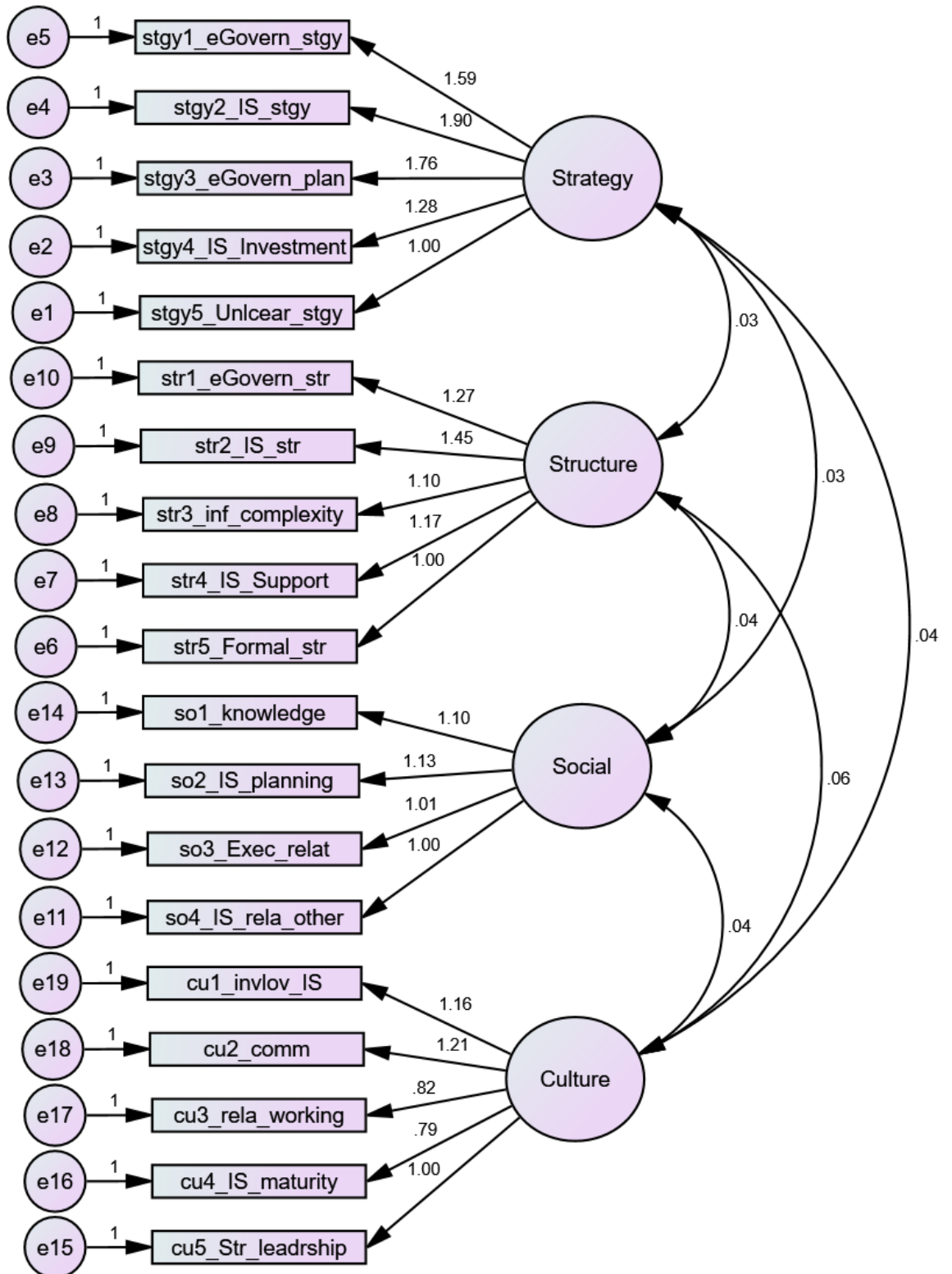


Figure 6-7. Structural equation model

6.4.5.2. Factor analysis through pattern matrix

To validate any research hypothesis or a framework, it is important to identify the relationship between the sub-factors with their parent factor and the sub-factor loading on their parent factor. All sub-factors load on their respective parent factor, which means that they are strongly aligned and statistically, the proposed framework is valid. According to Bryant and Yarnold, (1995), the term factor rotation is a procedure where sub-factors are rotated to attain a simple structure. For this research, we used varimax rotation in order to maximize the association among sub-factors and their respective parent factor.

The rotated alignment pattern (parent factor) and groups of sub-factors in one alignment pattern are loaded on their respective parent factor, as shown in Table 6-9. The result of the pattern matrix indicates that all sub-factors are suitably loaded on their related parent factor and a very clean factor structure is presented in Figure 6-7. The strategic alignment factor includes five sub-factors: 'eGovernment strategy must be aligned with IS strategy'; 'IS strategy must be aligned with eGovernment strategy'; 'eGovernment plan must be aligned with IS plan'; 'eGovernment must consider IS as assets not tool' and 'invest enough in IS and eGovernment strategy unclear among IS staff and vice versa'. All five sub-factors are loaded on the strategic alignment factor, which indicates that all five sub-factors belong to strategic alignment and have zero correlation with other alignment patterns.

Table 6-9: Alignment factors loading

| Pattern Matrix | | | | |
|-----------------------------|--------|------|------|------|
| | Factor | | | |
| | 1 | 2 | 3 | 4 |
| Strategic Alignment | | | | |
| stgy1_eGovern_stgy | .583 | | | |
| stgy2_IS_stgy | .552 | | | |
| stgy3_eGovern_plan | .526 | | | |
| stgy4_IS_Investment | .468 | | | |
| stgy5_Unlcear_stgy | .658 | | | |
| Structural Alignment | | | | |
| str1_eGovern_str | | .494 | | |
| str2_IS_str | | .597 | | |
| str3_inf_complexity | | .365 | | |
| str4_IS_Support | | .722 | | |
| str5_Formal_str | | .502 | | |
| Social Alignment | | | | |
| so1_knowledge | | | .837 | |
| so2_IS_planning | | | .665 | |
| so3_Exec_relat | | | .522 | |
| so4_IS_rela_other | | | .712 | |
| Cultural Alignment | | | | |
| cu1_invlov_IS | | | | .983 |
| cu2_comm | | | | .552 |
| cu3_rela_working | | | | .626 |
| cu4_IS_maturity | | | | .868 |
| cu5_Str_leadrship | | | | .558 |

The structural alignment factor includes five sub-factors: ‘eGovernment structure flexible to support alignment with IS’; ‘IS department structure should have suitable resources to support eGovernment goal’; ‘Complex eGovernment structure could lead to non-alignment’; ‘Lack of IS department support or investment could lead to non-alignment’ and ‘eGovernment formal structure could lead to lack of technological support from IS department’. All five sub-factors are

loaded on the structural alignment factor, which indicates that all five sub-factors belong to the structural alignment and have zero correlation with the other alignment patterns.

The social alignment factor included four sub-factors: 'IS department and other eGovernment agencies should share domain knowledge for the stronger alignment between both'; 'IS department planning must align with eGovernment planning so that IS support Government goals'; 'CEOs and CIO from IS department should have long-term relationships and planning so that alignment can be achieved' and 'Strong alignment requires a close relationship between IS department staff and staff from other government agencies'. All four sub-factors are loaded on the social alignment factor, which indicates that all four sub-factors belong to social alignment and have zero correlation with the other alignment patterns.

The eGovernment top management should be involved in IS planning to support cultural alignment , 'Better communication between IS department and other agencies in the eGovernment could improve alignment between both'; 'Strong working relationships between IS department and other agencies help to improve cultural alignment'; 'IS department should be culturally mature to support government goals' and 'Effective and helpful leadership of IS department and other agencies in the eGovernment could improve cultural alignment in the government infrastructure'. All five sub-factors are loaded on the cultural

alignment factor, which indicates that all five sub-factors belong to the cultural alignment and have zero correlation with other alignment patterns.

6.5. Summary

This chapter details the collection, analysis and results from the quantitative survey data that reveal the ideal pattern of alignment in the context of the adoption of eGovernment services. The chapter focuses on the satisfaction of eGovernment users with the e-services provided in the KSA. This chapter begins with a basic analysis to evaluate the consistency of the study data by finding the outliers, missing values and the expectations of a normal distribution.

The study's results revealed that eGovernment users in the KSA are mostly dissatisfied with the services that the KSA government is currently providing, because most services are manual, not online or automatic. Therefore, users highly recommend strong alignment between eGovernment agencies and the IS department. In the survey, we asked participants to rank the importance of alignment and confirm the factors that should lead towards strong alignment. The results show that eGovernment users in the KSA are in agreement of having an ideal pattern of alignment which aligns the eGovernment environment strategically, structurally, socially and culturally. This strong alignment could ultimately improve the quality of eGovernment services in the country.

Chapter 7 Business process modelling and alignment in the eGovernment sector

7.1. Introduction

The previous two chapters discussed the first phase of this research, namely the qualitative and quantitative studies. In these chapters, alignment patterns which include strategic, structural, social and cultural alignment is validated among eGovernment experts and eGovernment users in Saudi Arabia. This study phase confirms the factors that affect the alignment process in the eGovernment sector, what is the current state of alignment in eGovernment in Saudi Arabia, what do the general public think of the eGovernment services in the country and how can the alignment process be improved further in the eGovernment sector in Saudi Arabia, as shown in Figure 7-1.

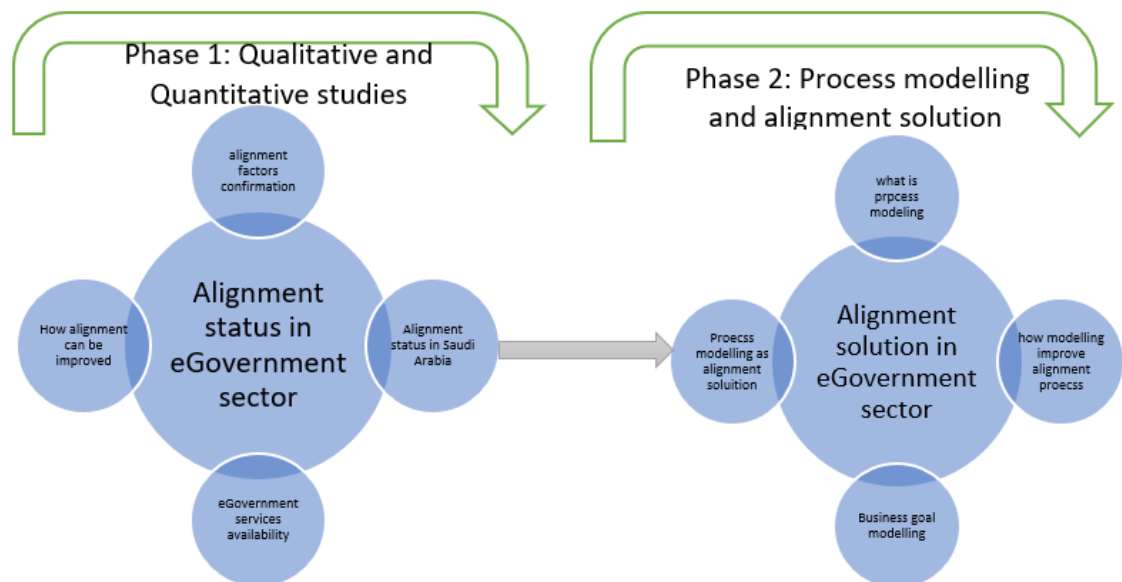


Figure 7-1. Relationship between empirical and modelling phase of the study

The literature indicates that most of the existing studies focus on the factors impacting alignment in the context of eGovernment infrastructure and measure alignment in different sized business organizations (large, medium and small). Only a few studies propose a solution to alignment from a business perspective, that being that the business structure should be aligned with the IS structure. However, our point of view is that the IS department is a service provider, therefore, the IS department should be aligned to the business structure. To provide a solution to alignment for the eGovernment sector in Saudi Arabia and to answer research question 3 “How can the alignment process in the context of eGovernment be improved and what is the role of process modelling in this context?”, this chapter discusses business process modelling for strong alignment between business and IS in the eGovernment infrastructure.

Moreover, in the second phase of the study (Figure 2.11), an alignment solution has been proposed in the context of modelling eGovernment processes and process goals, how process modelling improves alignment in the eGovernment sector of Saudi Arabia and what to consider in modelling when aligning information systems with other eGovernment agencies? One way of establishing strong alignment between IS and other government agencies is to develop IS in accordance with government expectations to ensure a system that meets the government’s needs (Flores, et al., 2018; Ullah and Lai, 2011; Abdullah, et al., 2006; Abanumy and Mayhew, 2005; Heeks, 2003).

System requirements engineering is the process of determining the government's perspective on the system, which helps developers design a system that accurately meets the government's needs. To obtain accurate system requirements, it is important to understand the business environment in which the system will be used. Therefore, business process modelling in the context of obtaining system requirements is necessary prior to developing the system (Salgado, et al., 2013; Ullah and Lai, 2011; Zowghi and Jin, 2010; De la Vara González and Diaz, 2007). This chapter presents a method of modelling and analyzing business processes with the aim of deriving the system requirements from the business goals and developing a suitable e-health system in the context of eGovernment.

7.2. Method of deriving IS requirements

Information and communication technologies (ICT) and IS are increasingly playing a vital role in the success of any type of business organization in the information age. The impact of IS on numerous domains, such as education, medicine, business, engineering and government (Santa, et al., 2019; Flores, et al., 2018; Abdullah, et al., 2006; Abanumy and Mayhew, 2005; Heeks, 2003) has been enormous. However, rapid changes in both the ICT and IS fields and substantial enhancements in digital connectivity have forced governments to change their structure. This is why governments these days are mostly reconsidering the way they work and interact both internally and with external

business organizations (Santa, et al., 2019; Corradini, et al., 2018; Das and Mishra, 2018; Veeramootoo, et al., 2018; Berghout and Tan, 2013).

Moreover, this rapid change in ICT and IS has also encouraged government organizations and associations to reassess their internal and external relationships and dealings (Santa, et al., 2019; Flores, et al., 2018; Abdullah, et al., 2006; Heeks, 2003). Therefore, alignment between IS and other government agencies is important to establish strong working relationships. One way of aligning IS with other agencies in the government is to develop a system in accordance with the government's needs. This is only possible if IS developers understand and analyze the government environment, activities and business processes, all of which must be considered before commencing the development phase of IS. It is for this reason that business process and goal modelling is required before IS implementation to ensure the provision of appropriate government services (Liu and Carter, 2018; Al-Hujran, et al., 2015; Cordella and Iannacci, 2010). In this chapter, we only deal with the derivation of IS requirements from the eGovernment process, which is level 2 of the method, therefore, this chapter will not discuss level 1 of the method.

The method described in this chapter aims to assist eGovernment by helping e-health system developers better understand the eGovernment environment and to derive the system requirements from the eGovernment process and goals. The proposed method requires a clear understanding of e-health processes in regard to modelling e-health processes/goals and extracting the related goals effectively

to generate e-health IS requirements. The method is divided into two levels, as shown in Figure 7-2.

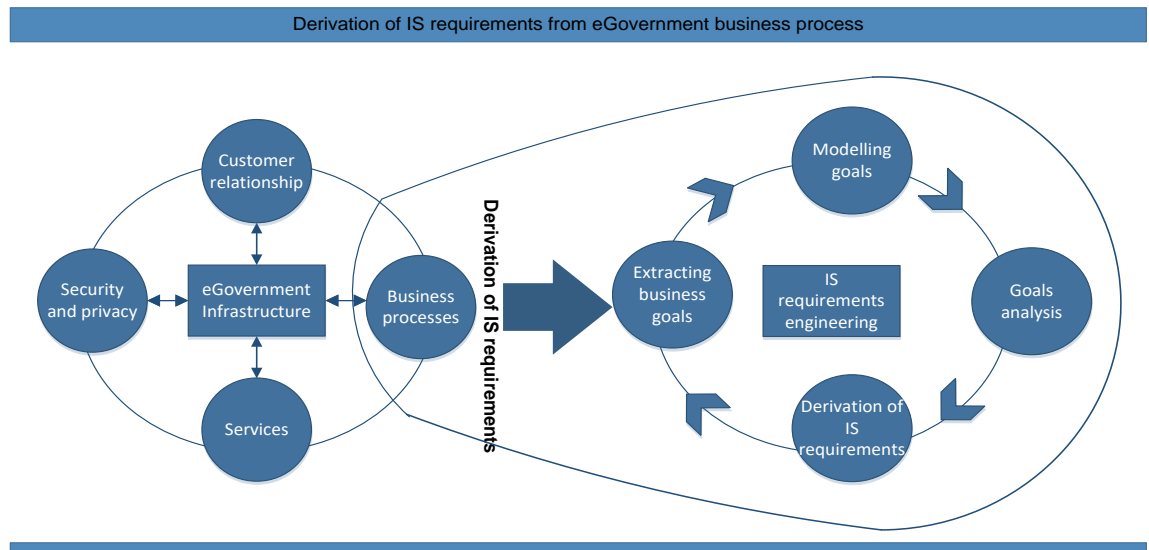


Figure 7-2. Business processes within eGovernment

The first level of the proposed method is derived from the existing literature, which is based on an understanding of the eGovernment infrastructure (Liu and Carter, 2018; Al-Hujran, et al., 2015; Al Ghoson, 2010; Cordella and Iannacci, 2010; Gartner, 2007). This infrastructure is divided into four phases, namely: security and privacy; customer relations; eGovernment services and business processes. This level demonstrates the decision stage within the eGovernment infrastructure and details the government’s objectives, government services and resources and the eGovernment’s strategies and processes in the form of a vision, goal, evaluation and government strategy targets.

Level 2 of the method defines the concept of modeling eGovernment processes to obtain, model and investigate e-health processes in the context of eGovernment and the development of an e-health system. This level explains how to attain IS requirements from the health processes that were obtained through modelling the eGovernment processes based on a thorough understanding of the healthcare environment. This level is divided into four phases: extracting business goals; modelling goals; goals analysis and derivation of IS requirements.

7.2.1. Extracting business goals

Information systems have been characterized by rapid development and integration with business, becoming essential components of most business organizations and industrial firms. Most business organizations in all sectors of industry, government, commerce, academia and health in developed countries are fundamentally reliant on their information systems (Khan, 2016; Veres, et al., 2009; Bleistein, et al., 2005).

For a government to maintain its competitive edge in an active business environment, it is necessary to understand how to systematically manage its information systems effectively. A key contributor to the successful operation of a profitable business in the contemporary business environment is an effectual and efficient information systems strategy supporting business strategies and processes (Salgado, et al., 2013; Ullah and Lai, 2011). Strong alignment between information systems and other eGovernment departments can improve

the performance of any government and the performance of any type of business organization.

An e-health process in the context of eGovernment has been selected to evaluate this proposed method. As the e-health process in the eGovernment infrastructure is the entity which focuses on the government's objectives in relation to providing improved health care services, modelling the e-health process is a key step towards obtaining IS requirements from the health process as it shows how the government's goals pertaining to e-health can be attained using a real-life scenario (Khan, 2016; Cardoso, et al., 2009; Bleistein, et al., 2005; Lehtola, et al., 2004). To model the e-health process, the well accepted UML technique, namely Business Process Modelling Notation (BPMN) has been used. The technique is widely used in the area of system analysis and development. It is now considered to be a standard modelling language that bridges the gap between the development process and the business model.

Patient visits to a healthcare provider were used as the process to be modelled and to validate the proposed method, as shown in Figure 7-3. This process was implemented by the Ministry of the eGovernment in Saudi Arabia, with the aim of improving the sharing of medical information between healthcare providers and the government so that e-health services in the kingdom could be improved.

As shown in Figure 7-3, the selected e-health process is divided into four stages: patient registration and doctor allocation; providing consultation to the patient;

further patient examination and discharge. In the first stage, the receptionist registers the new patient or retrieves the patient's data from the e-health system if the patient is already registered. In the second stage, the doctor commences the patient examination and stores the data related to the patient in the system, including laboratory results, patient medical history, referrals and prescriptions. This confirms that the doctor has examined the patient and has confirmed the patient's condition.

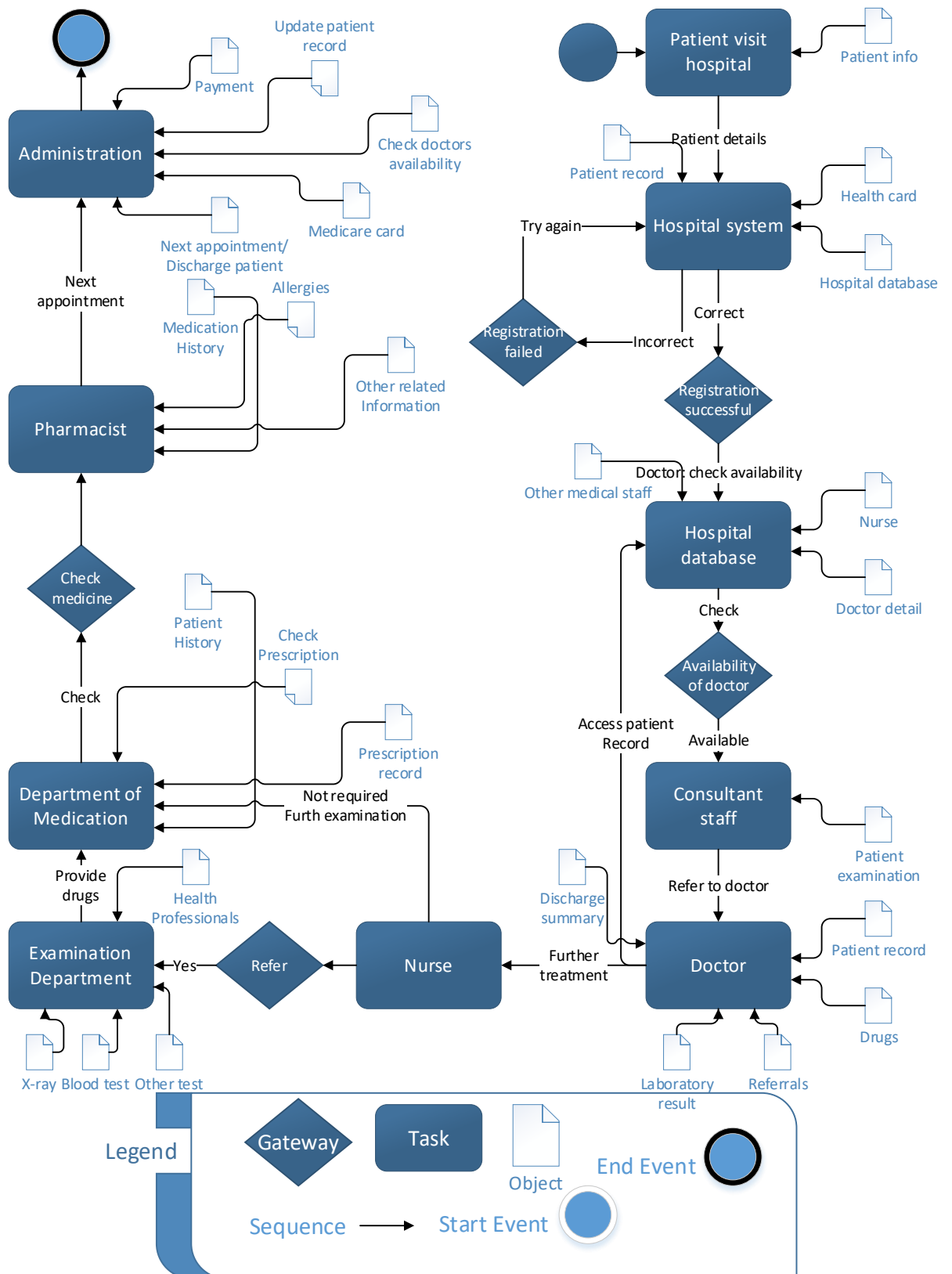


Figure 7-3. Process of e-health

In the third stage, if the patient requires further examination, such as a blood test or an X-ray, the doctor refers them to other medical departments or healthcare professionals. In the fourth stage, the hospital administrator organizes a follow-up patient visit if required, finalizes the payment and discharges the patient. The eGovernment process in the context of e-health as shown in Figure 7-3 illustrates how the overall health infrastructure will be improved by allowing healthcare professionals to share information and provide access to medical records. Moreover, it demonstrates how medical practices may be improved once the e-health information system is adopted and integrated with other existing eGovernment IS.

7.2.2. Business goals modelling and goals analysis

The eGovernment infrastructure includes many hardware devices, software applications and networks and is utilized by many participants with different capabilities and technical skills. In terms of the e-health process and by extracting business goals from the process, and modelling and analysing the goals, these different e-health stakeholders and a variety of components reduce e-health IS activities that are complex (López-López, et al., 2018; Al-Nuaim, 2011; Al-Busaidy and Weerakkody, 2009; Al-Fakhri, et al., 2008). Hence, the method of modelling and analysing eGovernment goals must be reliable enough to ensure the effective administration of the rapidly changing eGovernment processes and objectives (Almukhlifi, et al., 2018; Khasawneh, et al., 2013; Alshehri, et al., 2012).

Accurately modelling the eGovernment process is the key element in deriving IS requirements. Modelling the business process shows how different government requirements can be executed through every process to achieve the proposed goals. A single eGovernment goal can carry many sub-goals that need to be identified for complete business process modelling and to accurately extract the IS requirements.

In this proposed method, once the health process in the context of the eGovernment environment has been identified and modelled, we then classify the sub-goals in the selected health process using the concept of the UML goal tree. The goal tree in Figure 7-5 represents the sub-goals, which are extracted from the model in Figure 7-4. The goal tree in this model represents the number of eGovernment goals in the context of e-health and their related tasks. Moreover, this model prioritizes the goals, which helps to translate them into IS requirements.

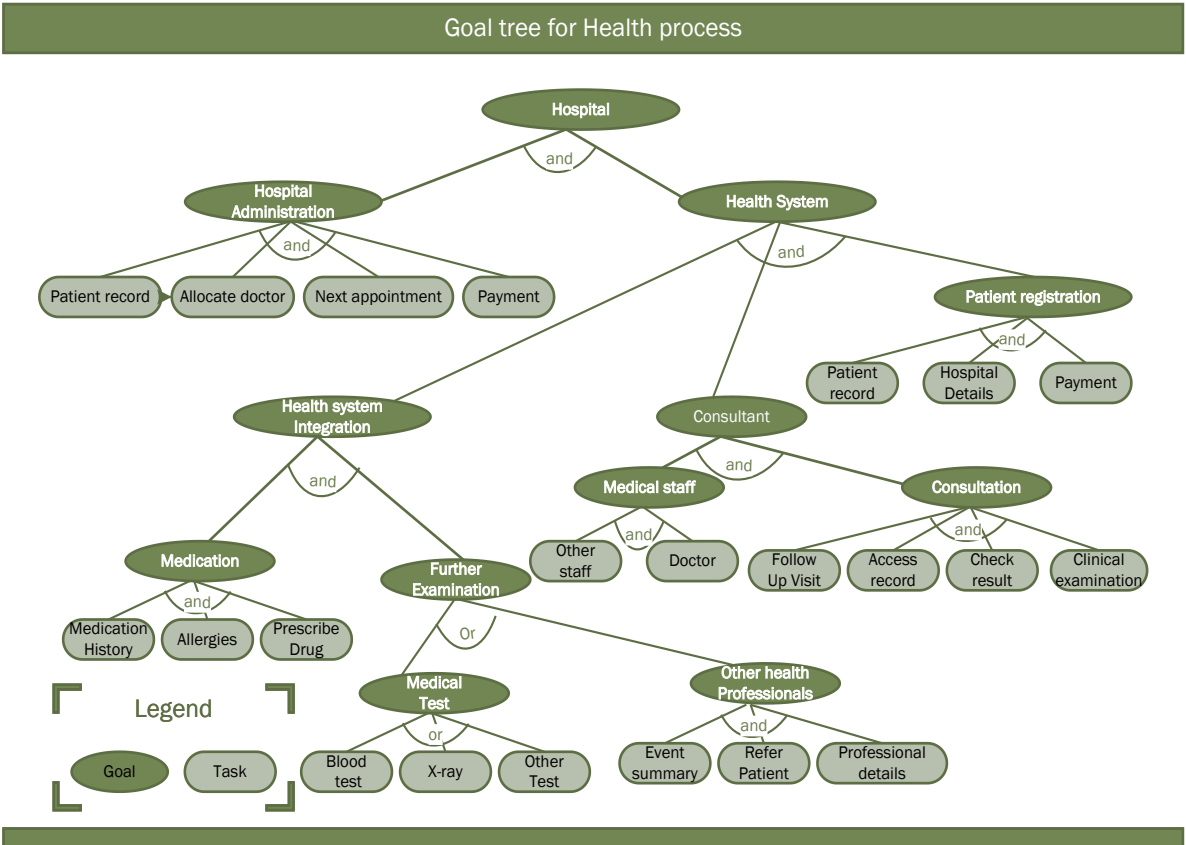


Figure 7-4. Identification of the goals and tasks in the e-health process

Once the goals have been prioritized, we then analyze the eGovernment goals by addressing the following questions: who are the IS stakeholders; where in the eGovernment sector is the system going to be used; and why does the eGovernment need this system? At this stage, the IS analysts examine the model and label the goals and tasks to identify which ones are not important to develop from the government's perspective. These goals and tasks are then marked with a cross and removed from the IS requirements. Figure 7-5 shows the analysis of the process, including the goals and their tasks.

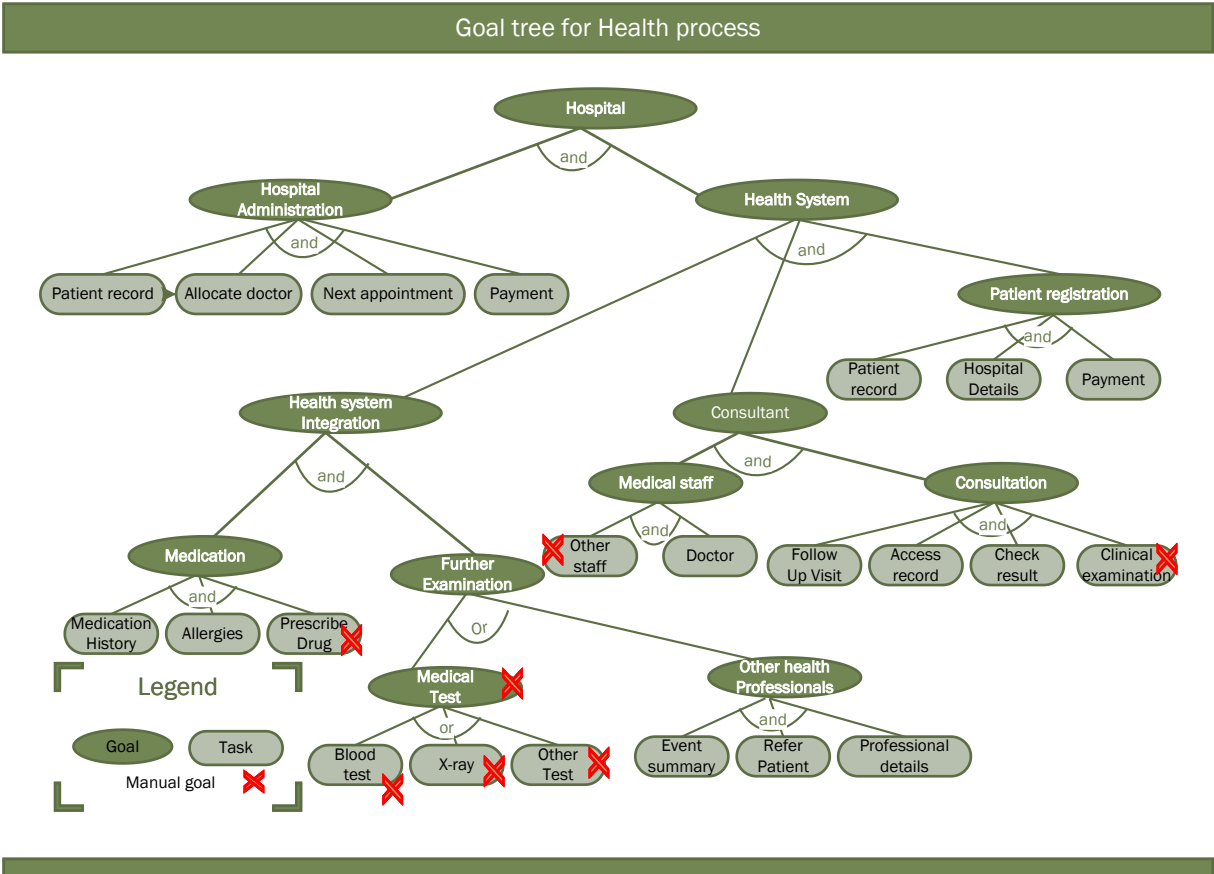


Figure 7-5. Analysis of e-health goals and tasks

7.2.3. Derivation of IS requirements for e-Government in the context of e-health

Once the business goals have been extracted from the proposed e-health process and analysed, the UML use cases are obtained from the UML goal tree, as shown in Figure 7-5. Figure 7-6 presents the UML use cases to show how IS developers can develop an e-health system in the context of eGovernment. Use cases in this model demonstrate the complete IS requirements, which are categorized into four roles: the hospital receptionist; the hospital system; the doctor and the nurse. The hospital receptionist registers the patient’s record and refers the patient to an available doctor. The doctor and nurse are the medical

staff who examine the patient. The hospital system actor represents the database of the hospital where the patient's records are stored.

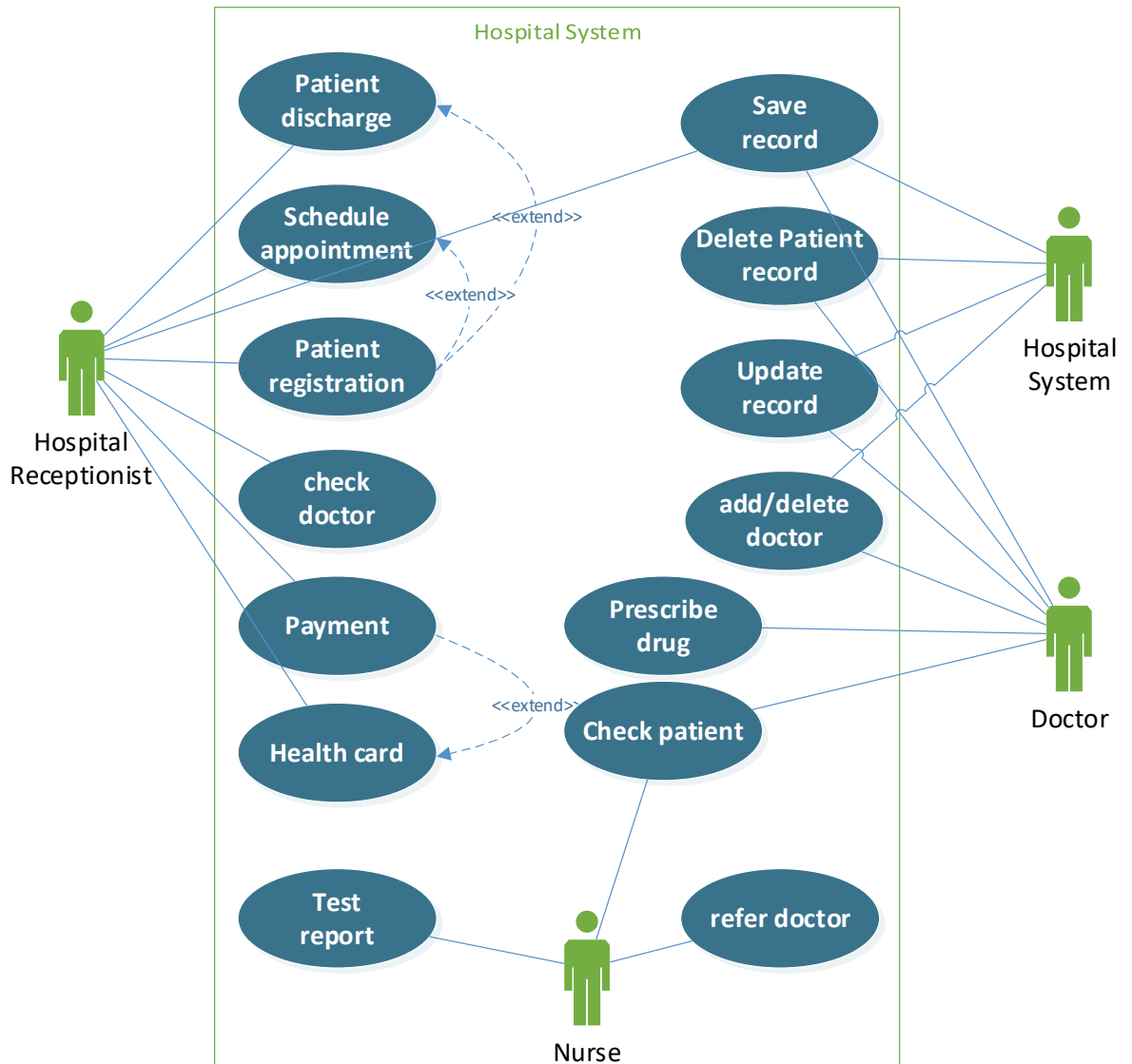


Figure 7-6. e-Health system requirements

The UML use cases allow the IS analysts to change or modify the IS requirements at any stage of the system development life cycle in order to remove ambiguity between the system stakeholders. IS analysts collect the details of the use case

package and forward these to the developers to complete the system. The e-health developers in the eGovernment infrastructure first check the use case package to see whether the package has any duplicate records or requirements. If there are no errors, e-health IS requirements are ready to implement. At this level, the e-health IS requirements are clear and understood, which helps the developers to design the system according to the government's expectations. This ensures there is strong alignment between IS and other agencies in the eGovernment sector.

The impact of IS on numerous domains, such as education, medicine, business, engineering, and governments has been enormous. However, rapid change in both ICT and IS fields and substantial enhancements to digital connectivity has forced governments to change their structure (Salgado, et al., 2013; Ullah and Lai, 2011; Cardoso, et al., 2009; Bleistein, et al., 2005; Lehtola, et al., 2004). For this reason, most governments these days are reconsidering the way they work and interact, both internally and with external business organizations. This rapid change in ICT and IS has also encouraged government organizations and associations to reassess their internal and external relationships and dealings. Therefore, alignment between IS and other government agencies is important to establish strong working relationships.

7.4. Summary

Alignment between business and information systems plays a vital role in the formation of dependable relationships between people from two different groups and the process of alignment can be improved by developing an information system (IS) according to the stakeholders' expectations. However, establishing strong alignment in the context of the eGovernment environment can be difficult. It is widely accepted that business processes in the government environment play a pivotal role in capturing the details of IS requirements.

This chapter presents a method of business process modelling and analysis for IS requirements elicitation. A case study on patient visits to a healthcare clinic in the context of eGovernment has been used to validate the method.

Two main implications can be derived from this chapter. First, it focuses the attention of eGovernment and alignment researchers on business process modelling in order to ensure more and accurate support from IS. This proposed method shows how modelling the business environment can lead to a complete understanding of the goals and values of eGovernment in order to enhance any business process in any sector. Secondly, generating IS requirements from the eGovernment process is a challenging task due to the complexity of the eGovernment infrastructure, as one business process carries more than one sub-goal. This method defines how the eGovernment business process can be measured and the related business goals can be extracted.

Chapter 8 Discussion

8.1. Introduction

An effective and operational eGovernment has recently become a vital aim for the Saudi Arabian Government. Within the context of this research, we reviewed and reorganized eGovernment methodologies, proposed a framework for an ideal pattern of alignment for eGovernment infrastructure in Saudi Arabia and evaluated the proposed framework qualitatively and quantitatively. Finally, this study proposed an alignment solution through business process modelling to establish strong alignment between IS and other agencies in the eGovernment restructure in Saudi Arabia.

The research findings from the investigation of the study validated the proposed eGovernment alignment framework, which is presented in chapter five and chapter six of this thesis. Advanced and suitable statistical techniques were used to analyze both the qualitative and quantitative data. The Business Process Modelling Notation (BPMN) is in chapter seven for the business process modelling in relation to establishing strong alignment in the eGovernment environment. The investigation of the ideal pattern of alignment in the context of eGovernment and the key factors that influence the intention to use eGovernment in Saudi Arabia are the primary objectives of this research.

This chapter presents a detailed analysis of the study results in the viewpoint of understanding the importance and relevance of the study results. The chapter

describes and assesses what the study results indicate, how the result relates to the existing research work and how we answer the research questions by constructing an argument to support the overall research conclusion.

Moreover, this chapter also presents an interpretation of the research findings. The chapter makes use of descriptive data outcomes from qualitative and quantitative studies to provide further clarification and an explanation of the research findings and business process modelling for alignment in the eGovernment sector. This chapter begins with an overall discussion of the research findings, leading to the benefits of alignment in the context of eGovernment in Saudi Arabia.

8.2. Discussion of research findings

Numerous government, organisational, technical, cultural, strategic, structural and social issues that impact the alignment process and the design and development of eGovernment products and services were discussed in the literature review chapter. During this research, the following research findings were made.

Firstly, alignment in the context of eGovernment is not a static process, rather it is a continuous process. In Saudi Arabia, a misconception held by the public and eGovernment experts in the country is that if the government spends money on the alignment process, it will be a one-off investment in time and money. Our data-based results show that after this investment, many eGovernment services

are still not adequate and require further improvement. For example, the number of people who will visit Saudi Arabia to perform Umrah and attend Hajj every year cannot be predicted. As a result, ensuring that there are adequate resources for visitors is a challenging task and in some cases may lead to waste (Al Rajhi, et al., 2012; Alanezi, et al., 2012; Al Ghoson, 2010; Abdullah, et al., 2006; Abanumy and Mayhew, 2005), including resource waste. This indicates that some eGovernment experts still maintain that alignment is a static component, which is a perception that needs to change if progress in this area is to be made.

Secondly, economically thriving countries in the region are examples of superior eGovernment service developers and users, which should motivate Saudi Arabia to adopt new eGovernment services and improve existing services. Moreover, in Saudi Arabia, the support for eGovernment services among the young and educated population is a positive motivating factor for the government to raise awareness and systematically align the eGovernment infrastructure so that people's expectations can be met. During the summer months, temperatures in the country are very high, which is a further factor in support of developing the eGovernment infrastructure, so that people can access government services from their homes and so avoid the daytime heat.

Thirdly, Saudi Arabia is a Muslim country, in which two Holy Mosques are located in Makkah and Medina, therefore, it is an important place for Muslims worldwide. Millions of people from different countries visit Saudi Arabia to perform Hajj, which requires government departments in the country to have advanced information

technology systems in place in order to monitor, control and coordinate people. Recently, the Saudi King announced that a substantial budget is to be provided for the design and implementation of eGovernment systems, which is another encouraging factor for the future development in this area (Al-Shehry, et al., 2006).

A fourth point is that the strategic alignment between IS and other agencies in the eGovernment sector is a mechanism through which a government can envision the association among its different agencies or departments and strategies. It allows the government's senior management body to gather meaningful insights based on their progress. In Saudi Arabia, it is difficult to show the sustainability of an eGovernment infrastructure and to govern an optimal set of procedures that are mandatory for understanding government strategies. Moreover, the literature indicates that Saudi Arabia is currently seeking a strategic alignment framework to align the eGovernment infrastructure in the country, hence this proposed comprehensive pattern of alignment framework can provide a solution.

Furthermore, in terms of social alignment, IS staff and staff from other departments must share their domain knowledge and be aligned with the eGovernment aims and objectives (Almukhlifi, et al., 2018; Al-Khalifa, et al., 2017; Alanezi, et al., 2012). as relationships among people in eGovernment in Saudi Arabia are influenced by numerous sub-factors (Al-Ghaith, et al., 2010; Al-Fakhri, et al., 2008). A dynamic and productive workplace environment can be

created by people from diverse social backgrounds, depending on how eGovernment staff cope with the challenges of working as a team. Therefore, social alignment in the context of eGovernment has been found to function as a significant precursor to eGovernment services (Aloud and Ibrahim, 2018; Al-Nuaim and Practices, 2011). Karahanna and Preston (2013) found evidence of the link between social alignment and eGovernment. However, in Saudi Arabia, innovation in the field of information systems and information technology is still in the early stages and requires strong social relationships.

Additionally, cultural alignment in the field of eGovernment plays a vital role for the success or failure of the government's missions. If all stakeholders in the eGovernment infrastructure are aligned culturally, it brings government values into focus and recognizes how the government's values are currently construed by the people inside the government environment (Liu and Carter, 2018; Al-Hujran, et al., 2015; Bannister and Connolly, 2012; Cordella and Iannacci, 2010). Once staff behaviour in the government environment has been recognized, cultural alignment between IS and other agencies helps to determine if the culture that exists in the government environment is aiding the progress of government performance (Wirtz and Daiser, 2018; Al Ghoson, 2010; Gartner, 2007). If cultural alignment is progressing well, it helps to identify the hidden processes in the government infrastructure and actions that can improve the culture over time. In Saudi Arabia, the most striking feature of high-performance eGovernment is the level of sustainable synchronization between IS and the

government culture that they establish (Alsenaidy and Ahmad, 2012; Alshehri, et al., 2012; Alshehri and Drew, 2010).

Finally, in today's complex working environment in the eGovernment infrastructure, the scope for non-alignment among eGovernment staff working in teams is wide and the consequences are vast. Moreover, when it comes to implementation, non-alignment among eGovernment staff leads to poor quality actions and decisions, miscalculation of time and money, frustration and misunderstanding (Santa, et al., 2019; Flores, et al., 2018; Abdullah, et al., 2006; Heeks, 2003). The results of this study show that to improve eGovernment services, it is important that senior management from the IS department and from other departments must understand and commit to the eGovernment objectives and missions.

These findings suggest that Saudi Arabia is still in the early stage of the implementation of eGovernment services, and to improve further, the government should ensure sure that the eGovernment infrastructure is aligned strategically, structurally, culturally and socially. Moreover, a greater acceptance of and change in perception towards the adoption of eGovernment and new technology among the older population, would be beneficial. There is significant support from the younger generation for budget to be allocated to developing the eGovernment and its projects (Aloud, et al., 2018; Alsenaidy and Ahmad, 2012; Al-Nuaim and Practices, 2011; Al-Saggaf, 2004).

If government is able to align with the eGovernment infrastructure, the most obvious advantage which could be gained would be improved services for citizens. Moreover, the Saudi Arabian government in an independent body of management that uses public funds to work for and to protect the requirements of the people. Governance involves the appropriate administration of resources and people for communal good. To achieve this, the Saudi Government, like others, has devised new eGovernment projects. These eGovernment projects bring many benefits for the citizens and municipalities. Alignment between IS and other agencies could bring the following benefits to the government of Saudi Arabia.

Gaining citizens' trust: eGovernment services can help governments to build trust among people and the government's administration, an important feature in good governance, by using computer-based strategies to include people in the process of decision making and policy, demonstrating the government's liability and transparency (Almukhlifi, et al., 2018; Al-Khalifa, et al., 2017; Alanezi, et al., 2012).

Quick design and implementation: with eGovernment, the administration has been made very instinctive, easy and simple. An eGovernment mechanism allows the sharing of data and thoughts among all government departments and allows for the development of one central database (Almukhlifi, et al., 2018; Al-Khalifa, et al., 2017). Communicating government strategies and results to the

public is made easy, as information and data held within the eGovernment are accessible to all Saudi citizens.

Government operation efficiency: for citizens, the most important point is the efficiency of the eGovernment services currently offered by the government. The efficiency of the government is measured through the success of its public relations. The analyses and processing of paper-based activities in an outdated government arrangement is a problematic job that consumes a significant amount of time, effort, money and other resources and yet does not produce greater value for citizens (Almukhlifi, et al., 2018). This matter becomes even more applicable when the Saudi Government considers the fact that people are demanding extra from eGovernment services. Through the formation of a centralised communication channel, the Saudi Government can attain high operational effectiveness and efficiency.

Citizens' trust in the government: for the government of Saudi Arabia to maintain control of power, it must gain the public's trust. An eGovernment helps to automate business processes, which reduces the effort and resources that are required (Almukhlifi, et al., 2018). It improves facilities through a better understanding of citizens' demands and requirements, therefore aiming for continuous online services, which it achieves by refining transparency and easing the communication of information.

Cost of running government: eGovernment services in Saudi Arabia are very cost effective (Almukhlifi, et al., 2018) therefore, government planning to use eGovernment services at all levels can reduce the cost of running the country. For example, if the Saudi government wanted to consider public opinion concerning the development of eGovernment services, it could devise and make available an online survey to collect data to evaluate to make appropriate decisions.

8.2.1. eGovernment experts' point of view

In the qualitative study, we interviewed 20 eGovernment experts from Saudi Arabia and the semi-structured questions were based on the ideal pattern of alignment. The study participants were from different working backgrounds and all were experienced in the field of eGovernment. We ensured that the selected participants had relevant experience and knowledge before we conducted the interviews.

These study participants are experienced in the field of eGovernment and information system services, as shown in Table 5-1. Therefore, the participants strongly recommend alignment for the eGovernment infrastructure in Saudi Arabia.

Moreover, in the qualitative study, the participants were asked about the importance of information systems in the eGovernment environment, as shown in Figure 8-1. The results show that 55% of participants believe that IS is very

important for the eGovernment infrastructure; 35% of participants believe it to be important and 10% of participants agree with the statement. If we compare this result with the literature review, several studies were published where researchers identified that IS is very important for the eGovernment infrastructure and for improving eGovernment services. According to Ullah and Lai, (2010), IS is a core component of eGovernment infrastructure where the success of eGovernment depends on IS reliability and suitability. This means that experts in Saudi Arabia still believe that eGovernment services in Saudi Arabia require further improvement and many newer requirements.

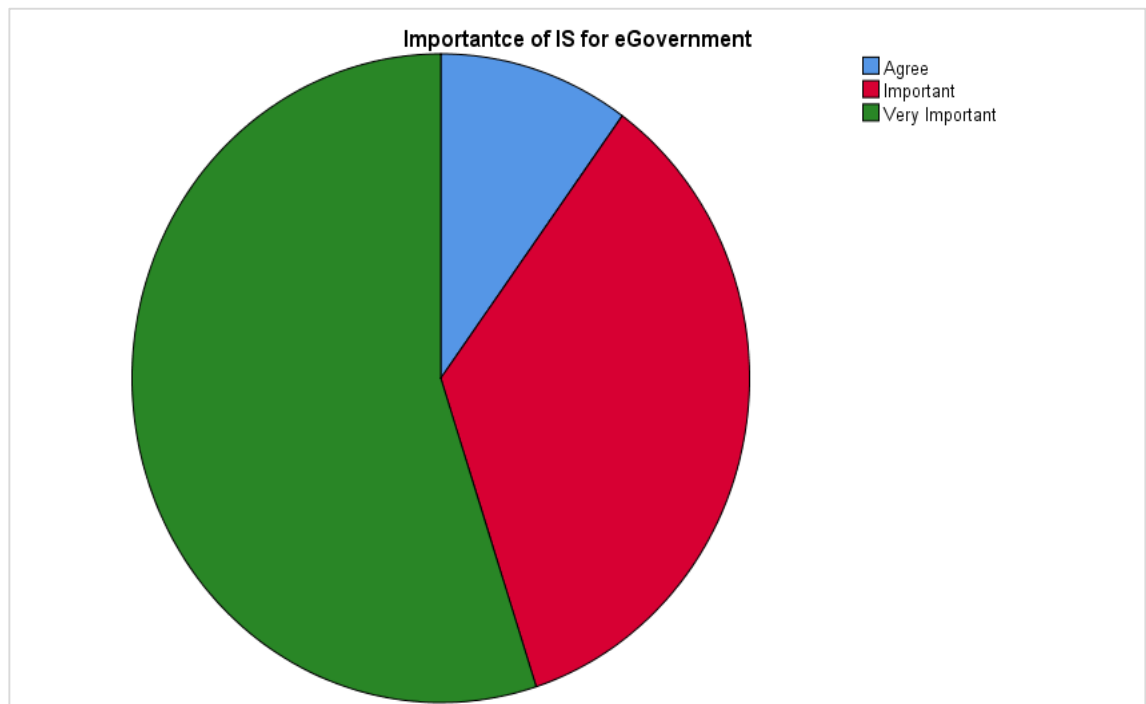


Figure 8-1: Importance of IS in eGovernment infrastructure

The study results indicate that the ideal pattern of alignment has been ranked between "important" and "very important" as a whole and each separate alignment pattern, namely strategic alignment, structural alignment, cultural

alignment and social alignment, has also been ranked between “important” and “very important”. Table 8-1 shows that eGovernment experts understand the importance of alignment in the eGovernment infrastructure, therefore, they strongly recommend this ideal pattern of alignment to Saudi government for further improvement in eservices.

Table 8-1: Importance of the ideal pattern of alignment in the eGovernment sector in Saudi Arabia

| Importance of the ideal pattern of alignment | | | | | |
|---|---------|---------------------|----------------------|------------------|--------------------|
| | | Strategic alignment | Structural alignment | Social alignment | Cultural alignment |
| N | Valid | 20 | 20 | 20 | 20 |
| | Missing | 0 | 0 | 0 | 0 |
| Mean | | 4.85 | 4.65 | 4.65 | 4.55 |
| Std. Deviation | | .366 | .489 | .489 | .510 |
| Variance | | .134 | .239 | .239 | .261 |
| Minimum | | 4 | 4 | 4 | 4 |
| Maximum | | 5 | 5 | 5 | 5 |

In the phase of strategic alignment between IS and other agencies in eGovernment, mostly experts highly recommend strategic alignment to establish relationship at the top level of the eGovernment sector, as shown in Table 8-2. A total of 85% of participants “Strongly agree” and 15% of participants “Agree” on the importance of strategic alignment for the Saudi eGovernment environment. Moreover, the literature shows that strategic alignment is a top-level concern in the eGovernment environment, which is a continuous process (Ullah and Lai, 2010). According to Ullah and Lai, (2013), strategic alignment is top-level

alignment, which means people who formulate government strategy must align with IS top-level management. They empirically studied the importance of strategic alignment in the eGovernment sector, and the results indicate that the participants ranked the question between “Natural” and “Agree”. This indicates that the importance of strategic alignment increases with time and today it is a key concern in the eGovernment environment.

Table 8-2: Importance of strategic alignment in the eGovernment sector in Saudi Arabia

| Strategic alignment | | | | | |
|---------------------|----------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Agree | 3 | 15.0 | 15.0 | 15.0 |
| | Strongly agree | 17 | 85.0 | 85.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

In the phase of structural alignment between IS and other agencies in eGovernment, experts mostly highly recommend structural alignment to establish strong working relationships at all levels of eGovernment sector, as shown in Table 8-3. A total of 65% of participants “Strongly agree” and 35% of participants “Agree” on the importance of structural alignment for the Saudi eGovernment environment. In the eGovernment sector, both IS and the other departments are structurally different, and they use different resources to complete their tasks. This makes eGovernment management to establish structural alignment between

both Business and IS bodies in the sector (Ullah and Lai, 2010). According to a survey conducted by Ullah and Lai (2013), 80% of organizations require strong structural alignment in order to achieve business goals and objectives effectively. Therefore, structural alignment is important for the eGovernment sector in Saudi Arabia.

Table 8-3: Importance of structural alignment in the eGovernment sector in Saudi Arabia

| Structural alignment | | | | | |
|-----------------------------|----------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Agree | 7 | 35.0 | 35.0 | 35.0 |
| | Strongly agree | 13 | 65.0 | 65.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

In the phase of social alignment between IS and other agencies in eGovernment, experts mostly highly recommend social alignment for establishing trust among staff at all levels of eGovernment sector as shown in Table 8-4. A total of 65% of participants “Strongly agree” and 35% of participants “Agree” on the importance of social alignment for the Saudi eGovernment environment.

Table 8-4: Importance of social alignment in the eGovernment sector in Saudi Arabia

| Social alignment | | | | | |
|------------------|----------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Agree | 7 | 35.0 | 35.0 | 35.0 |
| | Strongly agree | 13 | 65.0 | 65.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

In the eGovernment sector, social alignment comprises several elements, such as people, life style, taxes and standards in which the organization operates. This makes eGovernment management to establish social alignment between both business and IS departments(Ullah and Lai, 2010). According to a survey conducted by Ullah and Lai (2013), 87% of organizations require strong social alignment to achieve business goals and objectives effectively. Therefore, social alignment is important for the eGovernment sector in Saudi Arabia.

In the phase of cultural alignment between IS and the other agencies in eGovernment, experts mostly highly recommend cultural alignment to improve cultural issues among staff at all levels of the eGovernment sector, as shown in Table 8-5. A total of 55% of the participants “Strongly agree” and 45% of the participants “Agree” on the importance of cultural alignment for the Saudi eGovernment environment.

Table 8-5: Importance of cultural alignment in the eGovernment sector in Saudi Arabia

| Cultural alignment | | | | | |
|--------------------|----------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Agree | 9 | 45.0 | 45.0 | 45.0 |
| | Strongly agree | 11 | 55.0 | 55.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

In the eGovernment sector, the IS department and the other departments are culturally different, where both use different resources to compete with complete their tasks. This enables eGovernment management to establish cultural alignment between both (Ullah and Lai, 2010). According to a survey conducted by Ullah and Lai, (2013), 82% of organizations require strong cultural alignment in order to achieve business goals and objectives effectively. Therefore, culture alignment is important for the eGovernment sector in Saudi Arabia.

8.2.2. eGovernment users in Saudi Arabia

In the quantitative study, we surveyed the ideal pattern of alignment among eGovernment users in Saudi Arabia which involved a total of 200 users from different cities. In every city, the people expressed their view that eGovernment services should be further improved and they also demanded new services (Haque and Khan, 2019; Alshehri, et al., 2010; Al-Sobhi, et al., 2009). Therefore, of all the cities which participated in this research, as shown in Figure 8-2 , the

statistics are as follows: 12.5% were from the city of Buraidah, ; 10.5% were from the city of Dammam; 10.5% from Jeddah; 6% were from Khobar; 10% were from Mecca; 10% were from the city of Medina; 10% were from Riyadh; 12.5% were from Tabu; 10% were from Taif; 7.5% were from Unzizah and .5% were from other small cities in the country. The results indicate that Saudi eGovernment users are willing to learn new and innovative information systems in the form of e-services, therefore, the government should focus on the alignment process to maintain and control eGovernment services in the country.

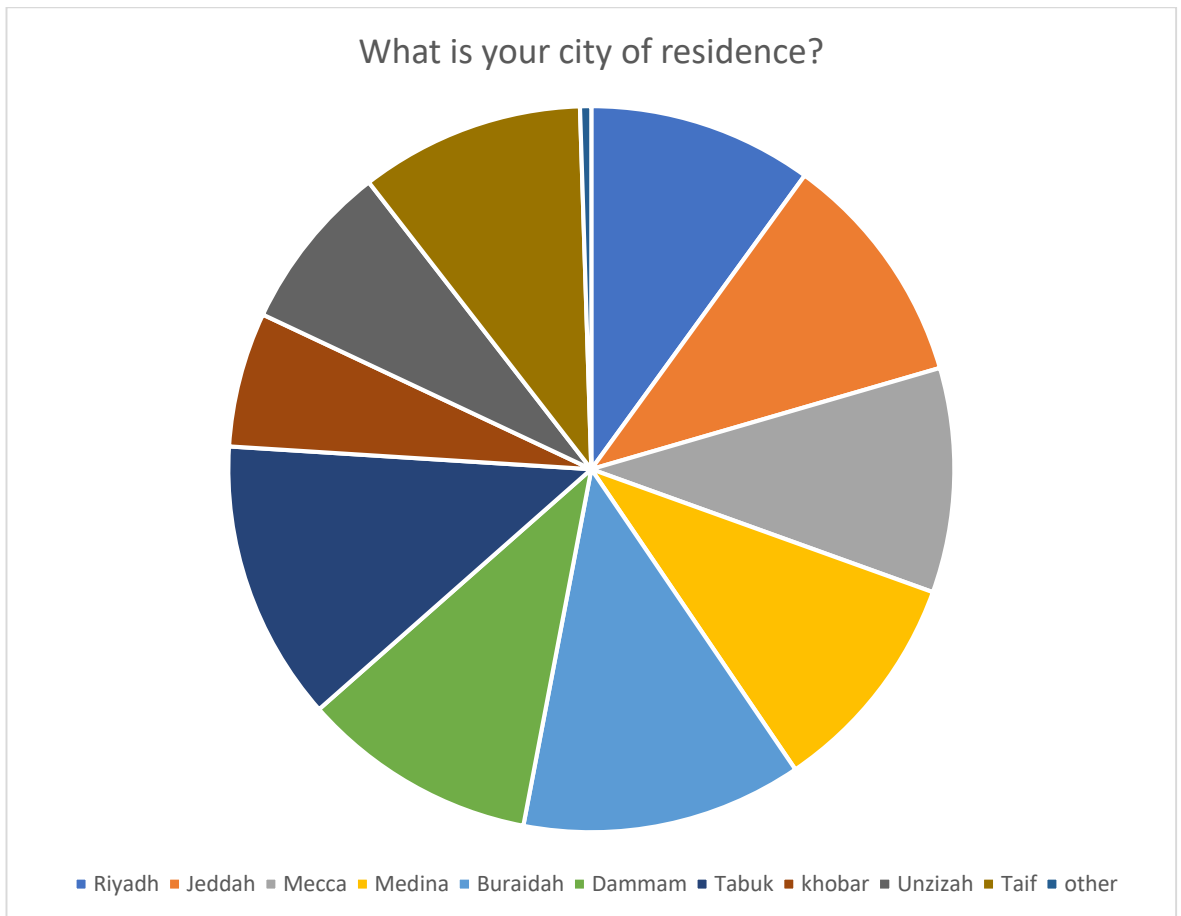


Figure 8-2: Participants' city residence

The study results indicate that eGovernment users of all ages participated in the study as shown in Figure 8-3. Of the 200 participants, 15.5% are aged between 18 years and 28 years, which shows that the younger generation in Saudi Arabia supports innovation in government business processes; 30.5% of participants are aged between 29 years and 39 years; 32.5% of participants are aged between 39 years and 49 years; 14.5% of participants are aged between 50 years and 60 years and 7% of participants are over 61 years of age. This data shows that citizens of every age range are willing to learn how to use information systems-based government processes and they support the government's eGovernment initiative.

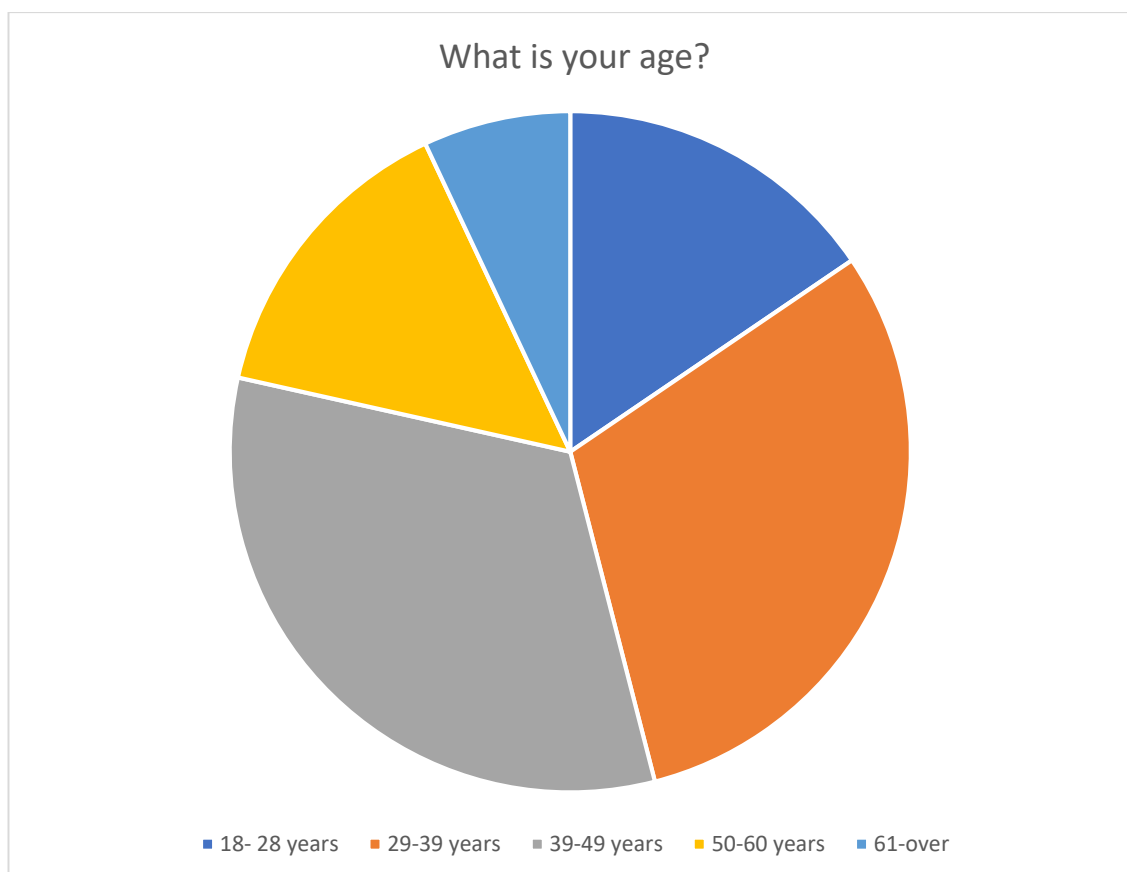


Figure 8-3: Participants' ages

The Saudi government currently offers five eGovernment services which are as follows: eHealth; eTax; student loans; family tax benefits and interior ministry e-services (Haque and Khan, 2019; Santa, et al., 2019; Khoja and Sheeshah, 2018; Alsenaidy, et al., 2012; Alshehri, et al., 2012; Alshehri and Drew, 2010; Al-Sobhi, et al., 2009; Magd, 2006). The study's results indicate that Saudi citizens use all these services, as shown in Figure 8-4. Of the 200 participants, 21.5% of the participants stated that they use eHealth services; 19.5% of participants stated that they use eTax services; 19.5% of participants stated that they use student loan services; 23% of participants stated that they use Family tax benefits and 16.5% of participants stated that they use Interior Ministry e-services. On the whole, eGovernment users in the country are happy about the services provided by the interior ministry.

Yaghoubi, et al. (2011) conducted a survey on eGovernment services and citizen satisfaction in Iran. According to this survey, 50% of the population was able to access eGovernment services, 58% required different types of eGovernment services, 65% were happy about the image of eGovernment in Iran, only 42% of the population were happy about the eGovernment services and 41% of staff had knowledge of eGovernment infrastructure. Overall, most eGovernment users in Iran were satisfied and required further similar services. This was similar in Saudi Arabia, where people required manual government services to be transformed into e-services. Table 8-6 presents further information on these research findings and provides a comparison with existing research.

Table 8-6: Discussion of findings and comparison

| Authors | Research focus | Data result | Discussion of findings in this research |
|---|--|--|---|
| Bergeron, et al., 2004; Peppard and Ward, 2004; Hirschheim and Sabherwal 2001; Henderson and Venkatraman, 1992 | Strategic alignment between business and information systems in the context of business environment | Business organizations cannot achieve suitable financial benefits without having strong strategic alignment | Both the qualitative and quantitative chapters' results indicate that non-strategic alignment is a significant challenge for the eGovernment of Saudi Arabia. A strong strategic alignment not only helps eGovernment to achieve financial benefits but also helps to control the eGovernment sector strategically. |
| Aslam, et al., 2016; Mirchandani and Lederer, 2014; Chung, et al., 2005; MacCallum, et al., 1996; Durand, et al., 1995 | Structural alignment between business and information systems in the context of business environment | The complexity of organizational structure could result in both departments misunderstanding each other | In the eGovernment sector, both business and IS departments have different structures. The study results indicate that eGovernment cannot achieve their goals if the IS department structure is not alignment with other departments in the sector. |
| Rahrovani, et al., 2014; Silvius, et al., 2013; Ullah and Lai, 2013; Juiz, et al., 2012; Jaskiewicz and Klein, 2007 | Cultural alignment between business and information systems in the context of business environment | Business organization performance could be very weak if top level management from both business and IS is not involved at the operational level. | In this study, we analysed the eGovernment sector in a qualitative and quantitative way, and the results indicate that eGovernment not only needs to have top level involvement at the operational level, but both business and IS staff need to be culturally aligned in order to achieve the desired goals. |
| Gallotti, et al., 2017; Heaselgrave and Simmons, 2016; Korhonen and Kaidalova, 2015; Karahanna and Preston, 2013; Van Den Hooff and De Winter, 2011 | Social alignment between business and information systems in the context of business environment | Business organization performance could be very weak if people from business and IS do not share their knowledge or experience with each other. | In this study, we analysed the eGovernment sector in a qualitative and quantitative way and the results indicate that eGovernment in Saudi Arabia needs to have strong social alignment between business and IS staff to achieve the desired goals. Also, eGovernment needs to develop trust between both the sectors and this is only possible if they are aligned socially. |

In the context of the importance of the ideal pattern of alignment in relation to eGovernment services, the results indicate that the people in Saudi Arabia support the alignment process in eGovernment infrastructure, as shown in Figure 8-5. They believe that this process will further improve the existing eGovernment services and will help the government to develop new eGovernment services. Of the 200 participants, 65.5% of participants selected “Strongly Agree” in relation to the importance of alignment between IS and other agencies in the eGovernment environment, 28.5% selected “Agree”, 3% selected “Neutral”, 2% selected “Strongly disagree” and only one 1 selected “Disagree” on the importance of alignment between IS and other agencies in the eGovernment environment.

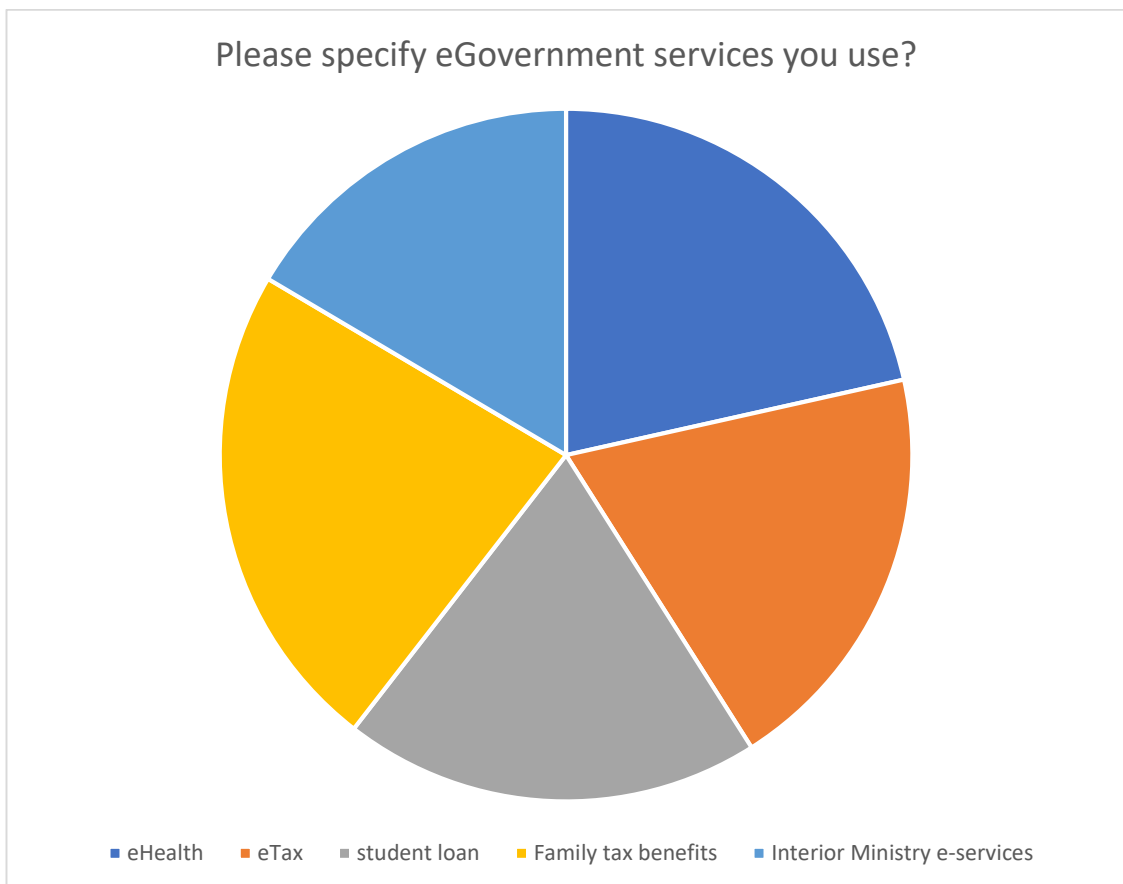


Figure 8-4: Usage of eGovernment services

8.3. Business process modelling and eGovernment in Saudi Arabia

Business process modelling in the field of eGovernment is the analytical depiction of a government business process. Business process modelling is usually done through various graphing approaches, for example, sequence diagram, flowchart and UML use cases. In the eGovernment sector, business process modelling has been used to map states of the government process. First, the As-Is state, is the state of the government process in its current state, without making any improvement or changes to the process. Second, To-Be refers to the future state of the government process, after making an improvement or change to the implementation of the existing process.

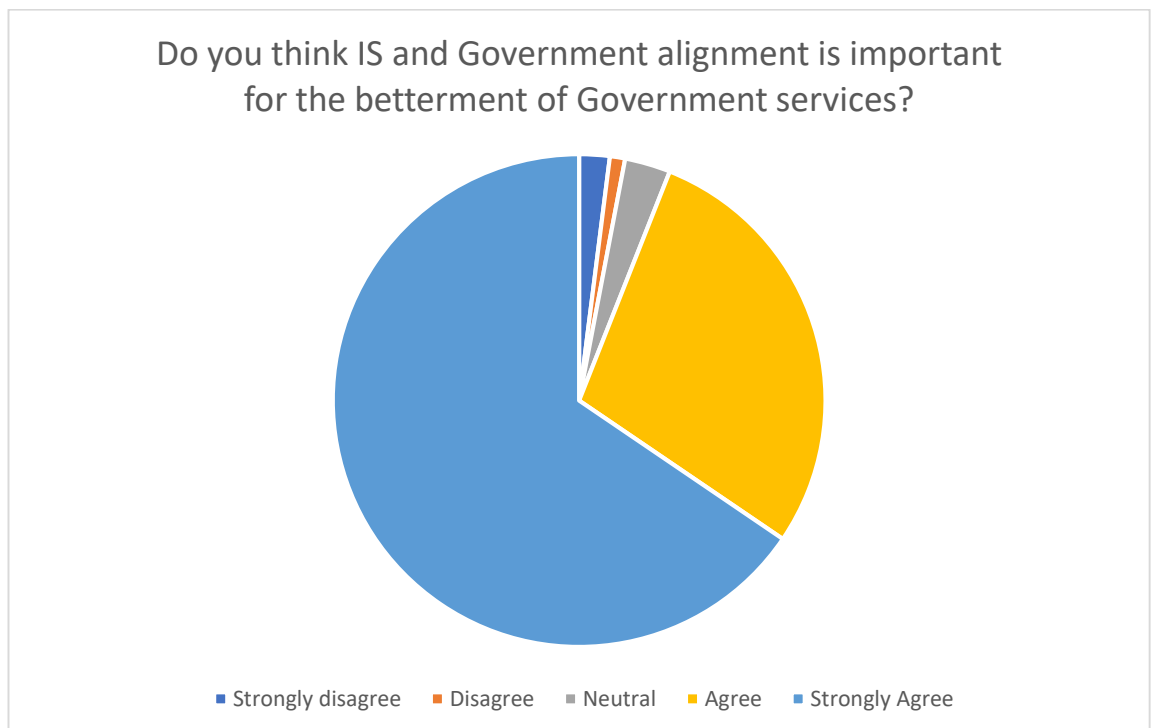


Figure 8-5: Usage of eGovernment services

The results indicate that in Saudi Arabia, the eGovernment infrastructure is at the beginning stage and requires substantial further improvement. This is not only because there are many government processes in Saudi Arabia which are still paper based, for example Table 8-7, shows some paper-based government processes (Almukhlifi, et al., 2018; Aloud and Ibrahim, 2018; Al-Nuaim, 2011; Al-Nuaim and Practices, 2011). Moreover, the current problem in the eGovernment infrastructure is the development of a suitable information system, which the eGovernment body uses to support citizens. It is often the case that information systems staff misunderstand the government's requirements, which results in the development of an information system which does not achieve the government's goals and objectives. Therefore, government process modelling is important to ensure everyone involved understands the government's requirements.

Table 8-7: Paper-based government processes

| |
|---|
| <p style="text-align: center;">Ministry of Labor and Social Protection of Population</p> <ul style="list-style-type: none"> ● Online receiving information on death of insured person ● Submission of reports on compulsory state social insurance ● Apply for targeted social assistance REGISTRATION-FREE ● "Provision of information on industrial accident to relevant government agency" ● Account schedule on temporary disability ● Account schedule related to benefits for taking care of child until he reaches three years of age ● Account schedule related to child birth benefit ● Account schedule related to maternity allowance ● Apply for change of pension and retirement type ● Apply for replacement of state social insurance certificate or issuance of duplicate ● Apply for the payment of funeral benefit ● Calculator for calculation of unemployment benefits |
| <p style="text-align: center;">Ministry of Transport, Communications and High Technologies</p> <ul style="list-style-type: none"> ● Keeping records of operators and Internet telecommunications service providers ● Online registration ● Searching for lost documents REGISTRATION-FREE ● Postal addresses - interactive map REGISTRATION-FREE ● Verifying the authenticity of a document signed with electronic signature REGISTRATION-FREE ● Local (city (region) domestic) disclosure of outgoing calls ● Apply for a mobile authentication certificate |
| <p style="text-align: center;">Central Election Commission</p> <ul style="list-style-type: none"> ● Inclusion of data for voters' list REGISTRATION-FREE ● Online application REGISTRATION-FREE ● Search of addresses of constituencies and polling stations REGISTRATION-FREE ● Search of constituencies and polling station by voters' addresses REGISTRATION-FREE ● Search of constituencies and polling stations by name, surname and patronymic REGISTRATION-FREE ● Search of constituencies and polling stations on map |
| <p style="text-align: center;">Ministry of Education</p> <ul style="list-style-type: none"> ● Apply for admission to vocational schools ● E-application for State Program on Education of Saudi Youth ● Online verification of educational documents ● Recognition and determination of equivalence of diplomas issued abroad ● Reference on secondary schools of schoolchildren ● Reference on workplace of teaching and technical staff working in secondary schools |
| <p style="text-align: center;">Ministry of Economy</p> <ul style="list-style-type: none"> ● Apply for a certificate confirming origin country of products ● Apply for a certificate of quality confirming the quality and safety of food products exported ● Apply for a confirmation code number to production and processing enterprises engaged in export of food products to Saudi states ● Apply for registration of grant agreements in respect of commercial legal entities ● Online payment of state duties, fines and other payments REGISTRATION-FREE ● Payment of administrative fines and financial sanctions via the internet |

Additionally, in the qualitative and quantitative chapters of this thesis, we validated a framework for the ideal pattern of alignment in the context of eGovernment services. The results for both the qualitative and quantitative chapters indicate that non-alignment is a significant challenge for the government of Saudi Arabia. The question is: what is the actual problem of non-alignment and how can the eGovernment environment be aligned in the country? Therefore, business process modelling can be considered as the solution for non-alignment, as the method of business process modelling allows IS developers to better understand government requirements, which alternately aligns the eGovernment environment. Other benefits of government process modelling are as follows:

- Improving efficiency in the government process: the key function of business process modelling is to further improve the current government processes. Through this technique, the government may be able to find different methods to improve the way its process works, which leads to improved efficiency in the process, process output, process productivity, and maximizes the profits from the government process.
- Enforcing standardization: further alignment results in the standardization of the eGovernment infrastructure. For example, there is a non-alignment when government running eGovernment projects, different team members act differently and there could be a gap in understanding between the operation team and senior management. Therefore, business process modelling ensures standardization throughout the eGovernment infrastructure.

- Government process agility: if business process modelling analysis is a standard within an eGovernment environment, the government will ultimately develop a culture of managing change and innovation. By being able to continually align government operations, the government will be able to develop in the face of technical change.
- Transparency in the eGovernment environment: every staff member in the eGovernment infrastructure will be, more or less, aware of how government processes work: what is the process aims and objectives, how process works and what is the expected outcome of the process. This leads to liability; who owns what government process becomes transparent.

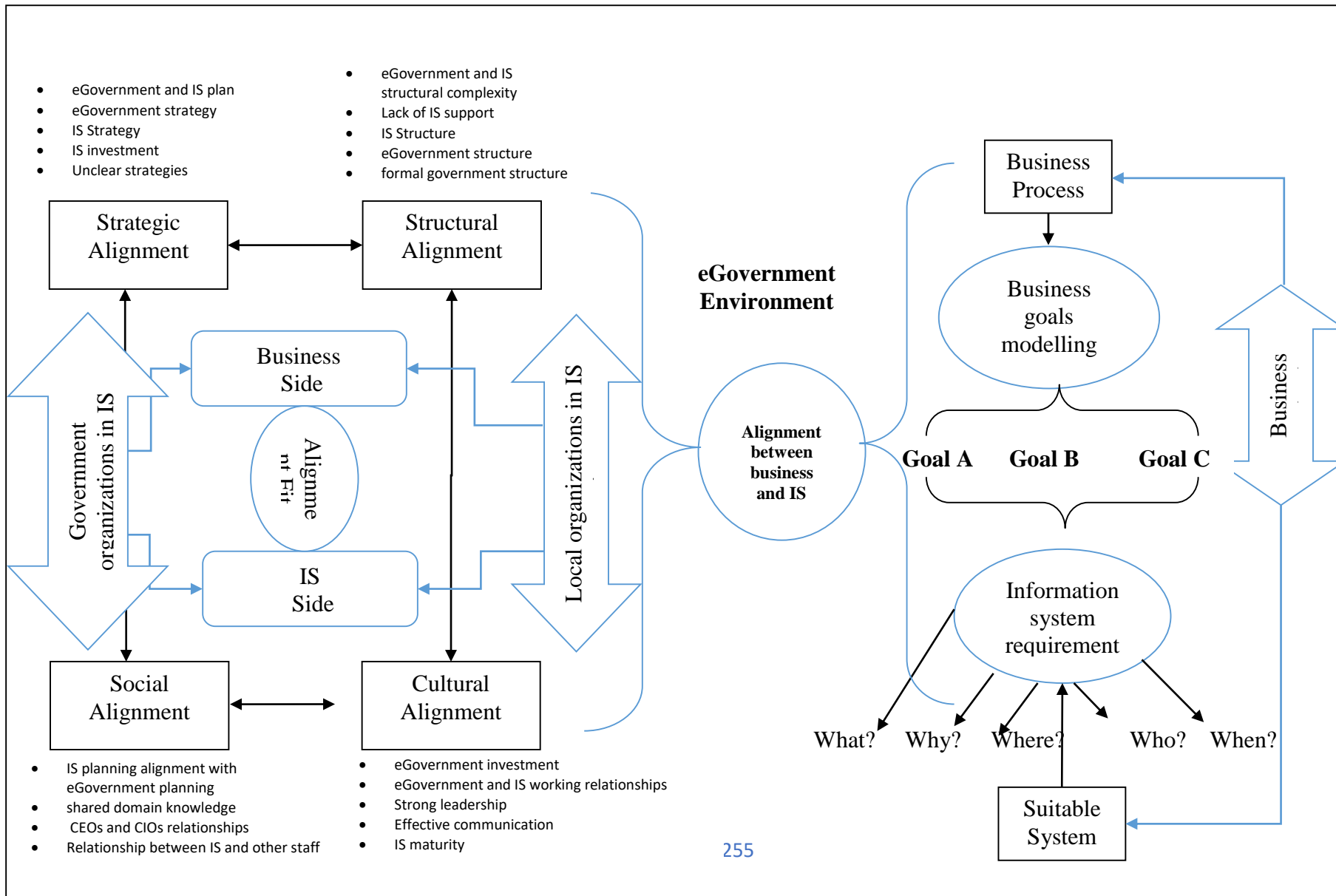
The proposed framework was first based on the factors extracted from the literature, but the framework has been updated based on the qualitative and quantitative studies results.

In the conceptual framework of this thesis, several factors have been extracted from the literature. For example, in the conceptual framework, three sub-factors were extracted from the literature review under strategic alignment, three sub-factors under structural alignment, three sub-factors under social alignment and four sub-factors under the cultural pattern of alignment, as shown in Figure 2-11.

However, the conceptual framework was discussed with five alignment and eGovernment experts before the qualitative study was conducted. During this pilot test, two more sub-factors (IS investment, Unclear strategies) under strategic

alignment emerged, two more sub-factors (eGovernment structure, formal government structure) under structural alignment were recommended, two more sub-factors (CEOs and CIOs relationships, relationship between IS and other staff) under social alignment were recommended and one more sub-factor (IS maturity) under cultural alignment was recommended.

When this conceptual framework was evaluated qualitatively by eGovernment infrastructure and services experts, they gave a low ranking to the factor unclear eGovernment strategy under the strategic alignment pattern and a low ranking to the factor formal eGovernment structure under the structural alignment pattern. Therefore, these two factors were removed from the framework. All the sub-factors in their respective alignment pattern were ranked as shown in Figure 5-9. However, when this framework was quantitatively evaluated by a larger audience, these two factors received a high ranking similar to the other factors in the alignment patterns, as shown in Figure 6-7. Figure 8-6 shows the new sub-factor rankings in their respective alignment patterns in the modelling phase of this study. The final alignment framework is presented in Figure 8-6.



8-6: Final alignment framework

8.4. Summary

In this study, we have developed a framework of alignment in the context of eGovernment, which describes the success factors of alignment and measures their presence in eGovernment services in Saudi Arabia. The research results show that alignment is very important for eGovernment infrastructure improvement. Moreover, eGovernment in the country has a firm footing and eGovernment services are now widespread among the public, particularly the young and educated population.

This chapter focuses on the discussion of the findings and it clarifies the study findings. The chapter makes use of descriptive data results from the qualitative and quantitative studies to provide further explanation on the findings and discusses how business process modelling for alignment in the eGovernment sector can help to improve the non-alignment issue.

Chapter 9 Conclusions and future research

9.1. Introduction

The findings of the study were discussed in Chapter 8 and this chapter concludes this research. This chapter overviews, summarizes and evaluates the study which has been conducted, and discusses the implications of this research, the remaining challenges in the discipline and the possible aspects of our research that have been opened for upcoming examination.

It is widely accepted that alignment between business and IS in the eGovernment sector is challenging. The literature shows that research has been conducted in this area but from a strategic and structural alignment perspective, which motivates us to propose a comprehensive pattern of alignment for the eGovernment sector. This thesis develops a framework for business and IS alignment in the context of the eGovernment sector in Saudi Arabia. This research poses three research questions: What are the key patterns and their organizational factors that affect the alignment process in eGovernment services? How can business and IS disciplines be aligned in the eGovernment sector in Saudi Arabia? How can the alignment process in the context of eGovernment be improved and what is the role of process modelling in this context? all of which have been answered in this research.

In order to clearly present the research study's aim and objectives, chapter one presented an introduction covering the background and motivation; research

scope; research aims and objectives; research questions that have been selected for this research; research contributions in the context of the country of Saudi Arabia and overall in the context of the eGovernment sector and finally the thesis outline. To understand the factors affecting the alignment process in the eGovernment sector and how to confirm and address these factors, the topic was studied in detail. Chapter two presents a review of the topic grouped into the following sections: the origin of alignment; definitions of alignment; direction of alignments (strategic, structural, social and cultural alignment); the evolution of alignment, system modelling in the context of alignment and eGovernment and finally, a discussion was provided including the implications and future research directions.

In the eGovernment development life cycle, it is important to understand the country's culture and people's behaviour towards eGovernment services before the development of services and to propose any solution for the alignment of the eGovernment infrastructure. Chapter three presents the background and the current situation in the Kingdom of Saudi Arabia. Moreover, the chapter presents information related to the features of the nation including state demographic information, economy, culture, the climate, and current the position of eGovernment development in the country.

Chapter four presents the research methodology, research philosophy, research method, research design and research strategy. To answer research questions

1 and 2: “What are the key patterns and their organizational factors that affect the alignment process in eGovernment services?” and “How can business and IS disciplines be aligned in the eGovernment sector in Saudi Arabia?”, we conducted a qualitative study as described in chapter five. The chapter examined the influence of the ideal pattern of alignment in the eGovernment sector in Saudi Arabia.

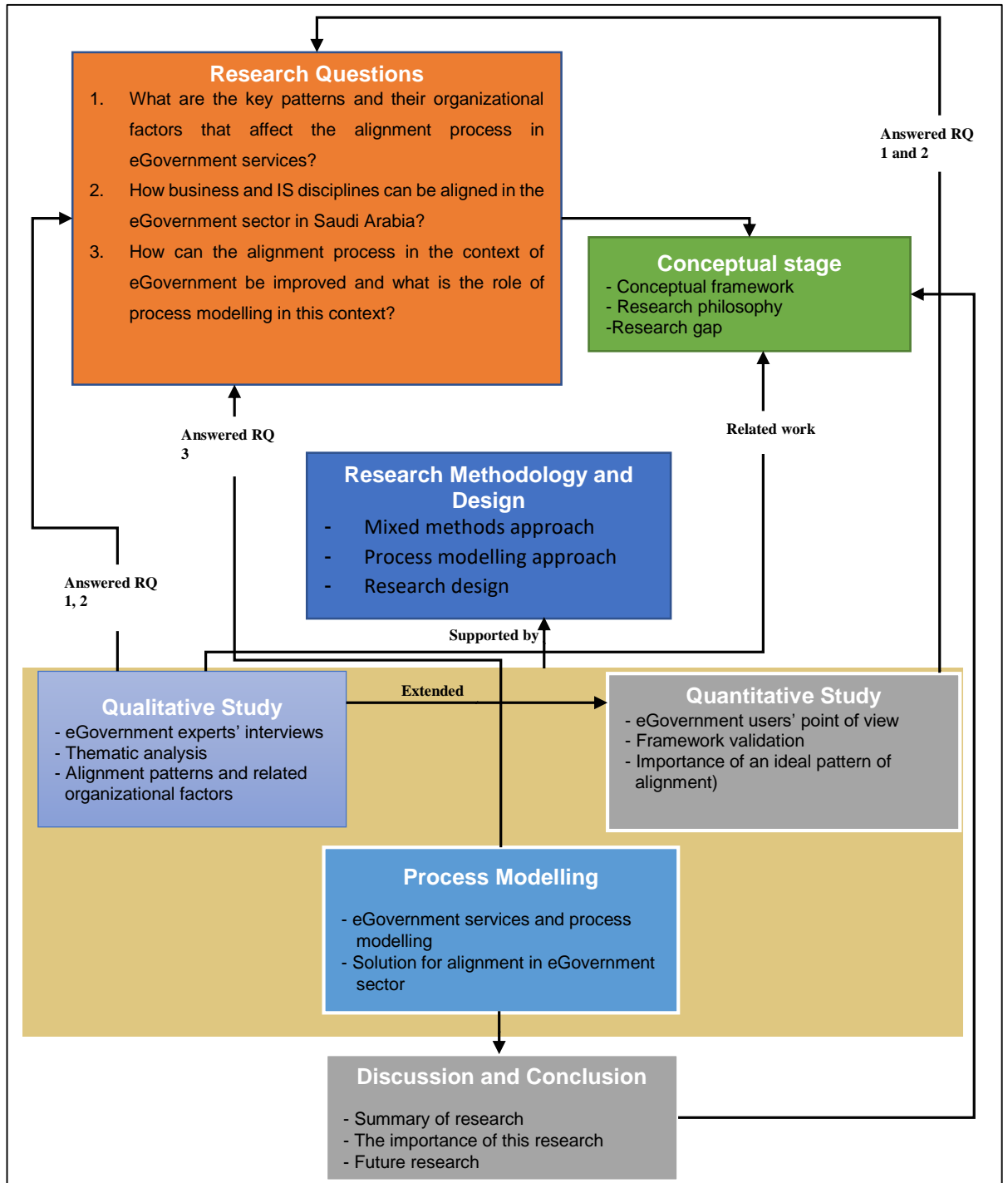


Figure 9-1. Conclusions across all research contributions

To examine the satisfaction of eGovernment users in Saudi Arabia in eGovernment services, chapter six presents a quantitative study, in which a proposed ideal pattern of alignment was evaluated by eGovernment service

users in the country. This chapter also answers research questions 1 and 2 from the eGovernment users' perspectives. The results of this chapter indicate a lack of community trust in eGovernment services which presents a significant challenge to public officers, politicians and citizens to provide a solution to alignment for the eGovernment sector in the country and to answer research question 3 "How can the alignment process in the context of eGovernment be improved and what is the role of process modelling in this context?". Chapter seven presents a method of eGovernment process modelling and analysis regarding information system requirements derivation. A case study on patient visits to a healthcare clinic in the context of the Saudi Arabia health sector was used to evaluate the proposed framework.

To present the results and implications of this research, chapter eight describes the analysis result of the ideal pattern of alignment and outlines what assistance could be elicited from quantitative and qualitative studies for the eGovernment environment in the Kingdom of Saudi Arabia. Moreover, the chapter reviews research findings and discusses how eGovernment process modelling for the process of alignment in the eGovernment sector could help to solve non-alignment problems. This section provides a summary of this research, as shown in Figure 9-1.

9.2. Contributions

The key contributions and research implications of this study have been discussed in the context of theoretical contributions and practice contributions summarised in Figure 9-2.

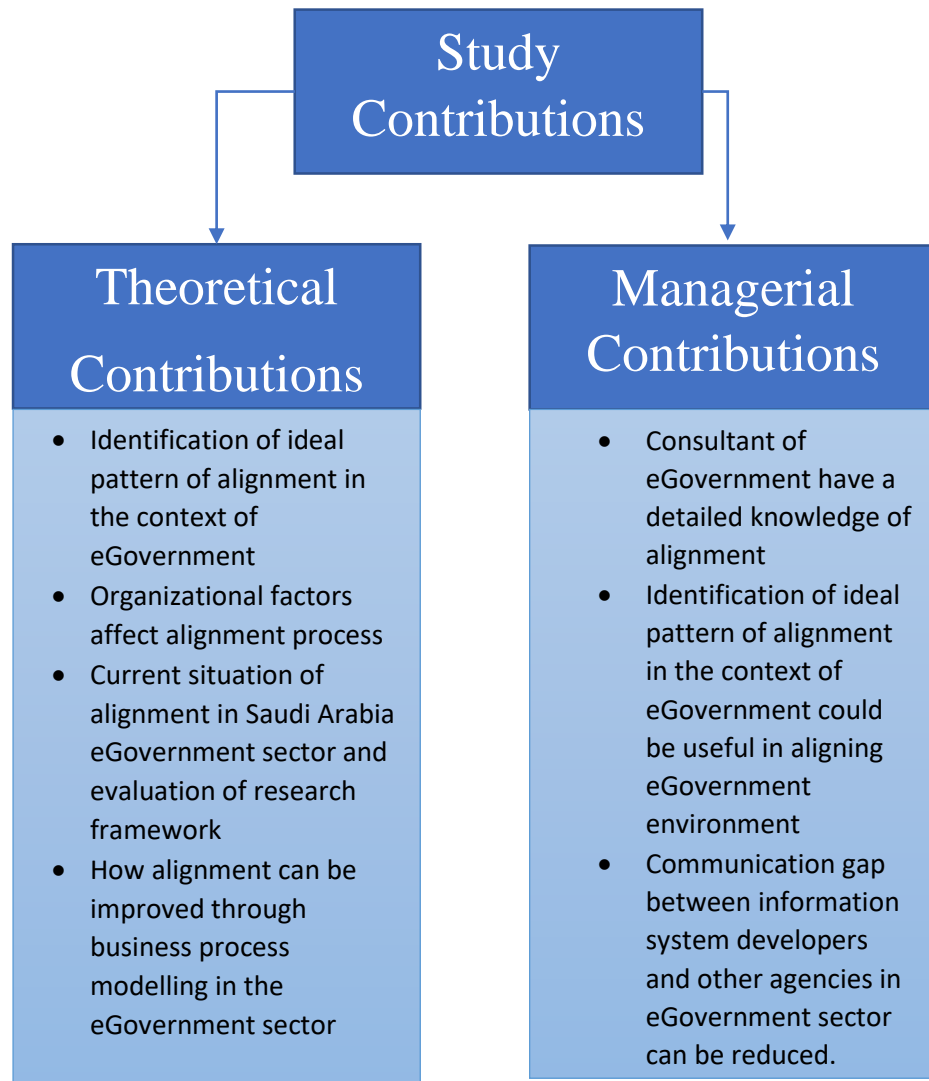


Figure 9-2. Research contributions

9.2.1. Theoretical contributions

In this research, we examined the proposed framework of the ideal pattern of alignment among eGovernment experts from the Ministry of eGovernment in Saudi Arabia. The key findings of this research have made several key contributions to the field of alignment and eGovernment as shown in Figure 9-2.

First, this study qualitatively examined the alignment factors in the context of the eGovernment sector. The study results revealed that the government of KSA is still not able to attain its goals due to a lack of alignment among government agencies. Therefore, eGovernment experts in the country recommended that this ideal pattern of alignment can attain high eGovernment performance in terms of high quality eGovernment services and can win the public's trust. Organizations' performance can be improved by establishing alignment. Moreover, the Saudi Arabia government currently spends a huge budget on infrastructure and technologies to make the country efficient. However, there remains a key challenge to the eGovernment in the country which is a lack of alignment between information systems departments and other government agencies. This has led to a lack of citizen awareness of KSA eGovernment services in the country. Organizations require strong alignment in the context of strategy, structure, social and culture in order to improve performance in the market (Al Ghoson, 2010; Schniederjans and Cao, 2009; Chan, et al., 2006; Kearns and Sabherwal, 2006; Li, et al., 2006).

Second, in this research, a framework of an ideal pattern of alignment for the KSA government has been proposed. The framework is based on four types of alignment between government agencies and IS department: strategic; structural; social and cultural alignment. The framework was evaluated by eGovernment users in KSA and the results revealed that typically, eGovernment users in the country are happy with the current facilities that the KSA government is presently providing, however some government process are still manual and time consuming. Therefore, eGovernment users in the country require more eGovernment services and this is only possible through strong alignment between eGovernment agencies and IS department. Organizations in which the IS department is strongly aligned with other departments provide better services compared to those in which alignment is weak (Bergeron, et al., 2004).

Third, the term alignment between business and IS in the context of eGovernment is a notion that is believed to be critical in understanding how government can interpret and justify its utilisation of IS to increase government performance, such as increased citizen satisfaction in government services, such as e-Tax, Medicare, the Passport Office, and an effective way of managing the pension process. Research into the impact of alignment between business and IS on eGovernment performance has been conducted in relation to two patterns of alignment: structural alignment between business and IS; and strategic alignment business and IS. However, the literature

indicates that the eGovernment sector faces many challenges due to a lack of alignment in terms of culture and social issues of organization. This research examines the impact of an ideal pattern of alignment which is based on four factors: strategic alignment between business and IS, structural alignment between business and IS, cultural alignment between business and IS and social alignment between business and IS. The research results indicate that an eGovernment sector which is aligned in these four factors can achieve high eGovernment performance and can win citizens' trust. Moreover, the results show that the eGovernment sector in Saudi Arabia can improve their internal and external relations by focusing on this ideal pattern of alignment.

Fourth, it is widely accepted that the establishment of strong alignment between business and IS requires suitable and up-to-date system support from an IS department. However, the development of a suitable system which meets the eGovernment's needs not only requires a suitable process of system requirements engineering, the eGovernment process must also follow the model before commencing the system development. In this thesis, we modelled one of the eGovernment processes and derived the system requirements with the aim of proving that process modelling is important for aligning business and IS in the context of eGovernment sector. According to Ullah and Lai (2013), business process modelling helps IS developers understand business requirements, which alternately allow them to develop IS based on the business needs.

9.2.2. Managerial contributions

In addition to the theoretical contributions of this study, there are number of managerial contributions to the business organization and eGovernment practices in terms of establishing strong alignment between IS and other agencies in the eGovernment sector. First, the eGovernment consultant plays an important role in the success of eGovernment services:

- Consultants develop ICT programmes for the eGovernment environment by understanding the existing practices of alignment in the environment.
- Consultants review the capability of the key bills and legislation related to the eGovernment environment and make recommendations.
- Consultants help to align the IS strategy with eGovernment strategy, which alternately promotes a strong working environment.

However, consultants face several challenges when it comes to fulfilling their job in the context of the eGovernment sector. This research presents a detailed literature review on alignment in the context of eGovernment and its analysis which could help consultants to design better eGovernment services.

Second, non-alignment issues between IS and business could affect the capability to implement company data management plans. Moreover, these days, business organizations are struggling to achieve quality management and data management objectives because of the many fundamental business process and

alignment related issues, for example, the ownership of data is unclear, eGovernment strategies are unclear to IS staff, eGovernment structure and culture is not supportive of suitable eGovernment services. This study proposed an ideal pattern of alignment which could help consultants align the eGovernment environment strategically, structurally, culturally and socially.

Third, a communication gap between information system developers and other agencies in the eGovernment sector is a serious issue for management and eGovernment consultants, as both IS and business people have different educational backgrounds and they have different business experience. This study proposed a business process modelling approach where IS requirements can be derived from the business process and suitable IS can be developed for eGovernment to reduce communication gap between IS and other agencies in the eGovernment sector.

9.3. Research implications

The alacrity of people to admit and appreciate new eGovernment services and innovation will regulate the success of the development of eGovernment. To encourage constructive attitudes of e-services users towards eGovernment, it is recommended that the government of Saudi Arabia pays better attention to the strategic, structural, cultural and social alignment between the information system department and other agencies in the eGovernment sector that have an impact on eGovernment services uses and adoption.

Moreover, the culture and social platforms in the Saudi community are religious in nature, with an Islamic ideology which plays an important role in understanding and determining the obligations, social norms, traditions, privilege and practice of the public and patterns. The literature indicates that people required IS services which makes their lives easy, however, the new and updated technology must be personalized to suit the philosophy in order to allow for the adaptation of eGovernment services. This research study proposes that eGovernment practitioners and policy makers in the country should consider strategic, structural, cultural and social alignment as a preliminary step in the design and implementation of eGovernment applications or services because strong alignment between all departments in the eGovernment sector could improve the government's services and could help to attract public interest.

Several major implications can be derived from this research, which are as follows:

- Saudi Arabia's society is traditional nature in which females depend on male family members regarding any means of transaction, such as shopping and government transactions. This indicates that the female population in the country lacks awareness of eGovernment applications and services. Therefore, it is recommended that the government of Saudi Arabia should start a campaign in which significant and important people in society could be asked to promote an awareness of the eGovernment system and to encourage the use of eGovernment applications and services. It is important that emphasis should be placed on the

compatibility of the innovation with the citizens' religion, lifestyle and traditions and other cultural values. This research could help the government to improve awareness of eGovernment services and attract more of the female population as alignment can gain the eGovernment users' trust by providing reliable and secure services.

- Performance expectation meaningfully impacts the adoption and uses of eGovernment and is a reliable predictor of an operator's success in implementing an eGovernment system. Therefore, it is predictable that the additional benefits in the context of saving user time and money, better eGovernment acceptance and greater uses will be attained. Moreover, this result can be explained by the lack of sense of time as a cultural value as the participants scored high for the flexibility and the accessibility of the system. The quantitative and qualitative study results indicate that if the government can align all departments in the eGovernment sector, the quality of eGovernment services may be improved, as eGovernment users require more suitable and reachable services 24/7 associated with old-style services. eGovernment practitioners and strategy makers in the country could consider promoting the advantages of the eGovernment programme to customers and deliver supplementary assistance to encourage wider development and acceptance of the eGovernment system.

- For researchers and eGovernment practitioners interested in the area of alignment in the context of the eGovernment research area, chapter 7 presents the eGovernment process analysis and modelling method in regard to obtaining the eGovernment system requirements for information systems to fully understand the eGovernment processes and the related process goals and eGovernment application requirements. This research draws the investigator's attention from a management perspective to driven solutions for the process of strong alignment in the eGovernment sector to information system driven, as nearly all current alignment methods are management-driven and fail to deliver adequate information from the information system perspective. This is because eGovernment experts still consider that the issue of alignment is difficult to solve and rank it at the top-level problem of eGovernment. The method that is proposed in chapter 7 is successfully evaluated and validated through procedures in the health department in Saudi Arabia and results confirm positive alignment between all eGovernment departments.

9.4. Limitations of the study

The empirical findings of this research are valuable and promising; however, the study has a few limitations, which were identified during the qualitative and quantitative studies. These limitations are useful for other investigators to consider for further investigation. The limitations of this study are as follows:

- Alignment is a continuous process and requires updating with the passage of time. The alignment framework proposed in this research is suitable for issues raised until 2019 from different business organizations. Therefore, this research is limited in terms of time, which is until 2019.
- The literature shows that rapid changes in eGovernment negatively influence the alignment process between the information systems department and other agencies in the sector, as business or policy makers' departments need time to move from one government goal to another. However, an information system requires extra time to implement and support the new government goal on time. This research is limited to one business process, which is the health process.
- The qualitative study in this research is limited to the data collected from only 20 eGovernment experts from Saudi Arabia. The data results show that eGovernment experts in Saudi Arabia may have limited knowledge of advanced eGovernment services.
- The quantitative study in this research is limited to the data collected from eGovernment users from one nationality, this being Saudi nationals. The study results indicate that this is limited to one nationality only and further investigation is required among other neighbouring countries.
- The proposed theoretical framework of alignment for eGovernment adopted in this current research might be used in further investigation with a larger data sample for qualitative and quantitative studies from Saudi

Arabia, which may include citizens living in rural areas and low-density residential zones.

There is an opportunity to convert the aforementioned research limitations into research prospects to be discovered as future research directions.

9.5. Future research directions

Throughout this research, several limitations were identified and require further investigation in the future. These future research directions are as follows:

- The process of alignment between the information systems department and other agencies in the eGovernment sector is not an easy matter to fix. However, it needs continual development since alignment in the eGovernment sector faces numerous continuing challenges which comprise staff skill variances among information systems and other agencies in the sector; formal and unclear eGovernment strategies; insufficient information system awareness amongst all business staff members; a lack of eGovernment goal awareness amongst all information system staff members; a lack of information system beliefs; social and cultural differences among eGovernment departments; structural variances among eGovernment departments and rapid change in the eGovernment environment. Therefore, alignment is an area in which we do not have any solutions, therefore in future, we might have a solution for alignment which does not require any further improvements by developing any automatic tools.

- Factors affecting alignment in the context of eGovernment uses and implementation were examined using a qualitative approach, where data was collected from 20 eGovernment experts from Saudi Arabia. The quantitative study aims to gain a full understanding of citizens' expectations and opinions; nevertheless, future work may be possible to strengthen the study with more eGovernment experts from different departments of the government.
- Future research could investigate eGovernment implementation and adoption in other Arab countries such as the UAE, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine and Qatar, and in areas which share cultural and social values that are similar to the Kingdom Saudi Arabia, they may adopt the theoretical model used in this present research to re-evaluate these findings.
- Future investigative studies into this topic may evaluate and analyze the alignment factors that may affect business users of eGovernment services that could strengthen the eGovernment services in the country.
- We analyzed and modelled health processes and obtained eGovernment system requirements from them mechanically which permits government to eGovernment management, to analyse eGovernment processes intensely and enables information system designers and developers to efficiently develop systems according to the government's needs. Therefore, further research may be possible in accomplishing all these processes modelling and requirements stages automatically that would allow the information system department to support government

processes in a timely manner, thus supporting them to fulfil government objectives efficiently.

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Appendix A: Interview template, Questionnaires, English and Arabic

Interview template for qualitative study

Improving eGovernment services through business/IS alignment in Saudi Arabia

Qualitative study

Note for recipient

Your feedback is essential for this PhD research and will stay completely confidential. Moreover, this questionnaire is a part of a PhD program at the Faculty of Business Plymouth University, UK. The purpose of this questionnaire is to help to study the process of alignment in the context of improving eGovernment services in Saudi Arabia.

If you have any questions or queries about this study or the overall research, please contact Mr Sulaiman Alfadhel, Plymouth Graduate School of Management (Faculty of Business), Plymouth University, UK at sulaiman.alfadhel@plymouth.ac.uk. The questionnaire should take around 10 to 15 minutes to complete.

If you are unable or do not wish to answer any part of this survey, please feel free to simply leave it blank. There is also a section at the end of the survey where you can submit any recommendations regarding this proposed research.

How to submit: When you have completed the survey, please submit it via email to sulaiman.alfadhel@plymouth.ac.uk. Only the survey will be saved and the email will be deleted.

Section 1: Personal Data

1. What is your job title?

2. How long have you been working in this field?

3. Why do you think IS is important for government organizations?

4. What is your organization's structure?

Public Private Government Semi-government Other

5. What is your organization's major activity?

- Banking and finance Computing/IS Education Government Sector
 Ministry of the Interior Medical Real Estate and Building Other

6. Is your business unit satisfied with the IS services?

- Strongly disagree. Disagree Neutral Agree Strongly agree

7. My business unit regularly provides business training to its IS employees

- Strongly disagree. Disagree Neutral Agree Strongly agree

SECTION 2: Benefits of alignment for eGovernment services

1. Do you think government organizations need to improve their level of communication? Why or why not?

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2. Do you think communication could be improved between business and IS executives. Why or why not?

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3. What do you think there is sufficient support for informal business and IS strategy in the context of alignment why or why not?

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4. Do you think the management skills of the IS staff in your organization could be improved in the context of alignment? Why or why not?

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5. What do you think about the use of IS within government organizations in the context of alignment?

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6. What do you think about the performance of business managers in the context of alignment?

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7. What do you think about the improved Government revenue in the context of alignment?

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8. Do you think organizations should reduce their investment in IS in the context of alignment? Why or why not?

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9. What do you think about the reduction in the overall investment cost in context of alignment?

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10. Do you think the government has improved the quality of its products as a result of alignment between business and IS?

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11. What do you think about the reduction in the overall investment cost in context of alignment?

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SECTION 3: Factors that promote strong alignment in the eGovernment sector. Strategic, Structural, Social and Cultural alignment

1 How important are the following factors in achieving strategic alignment between government needs and IS services?

The eGovernment strategy must be aligned with the IS strategy.

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The IS strategy must be aligned with the eGovernment strategy.

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The eGovernment plan must be aligned with the IS plan.

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The government must consider IS as an asset not a tool and invest a sufficient amount in IS.

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The eGovernment strategy is not clear to the IS staff and vice versa

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.. How important are the following factors in achieving structural alignment between government needs and IS services?

The eGovernment structure is flexible enough to support alignment with IS.

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A government structure which is too formal could lead to lack of technological support from the IS department.

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2 How important are the following factors in achieving social alignment between government needs and IS services?

The IS department and other government agencies should share domain knowledge for stronger alignment between both.

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The IS department's planning must align with the government's planning so that IS is able to support the government's goals.

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The CEOs and CIO from the IS department should have a long-term relationship and planning so that alignment can be achieved.

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Strong alignment requires a close relationship between IS department staff and staff from other government agencies.

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3 How important are the following factors in achieving cultural alignment between government needs and IS services?

The eGovernment top management should be involved in IS planning to support cultural alignment

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Better communication between the IS department and other agencies in the government could improve alignment between both.

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A strong working relationship between the IS department and other agencies could help to improve cultural alignment.

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The IS department should be culturally mature enough to support government goals.

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The effective and helpful leadership of the IS department and other agencies in the government could improve cultural alignment in the government infrastructure.

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SECTION 4: Feedback

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**Improving eGovernment services through business/IS
alignment in Saudi Arabia
CONDUCTED BY**

Plymouth University

Note for recipient

Your feedback is essential for this PhD research and will remain completely confidential. Moreover, this questionnaire is a part of a PhD program at the Faculty of Business Plymouth University, UK. The purpose of this questionnaire is to study the process of alignment in the context of improving e-Government services in Saudi Arabia.

If you have any questions or queries about this study or the overall research, please contact Mr Sulaiman Alfadhel, Plymouth Graduate School of Management (Faculty of Business), Plymouth University, UK at sulaiman.alfadhel@plymouth.ac.uk. The questionnaire should take around 10 to 15 minutes to complete.

If you are unable or do not wish to answer any part of this survey, please feel free to simply leave it blank. There is also a section at the end of the survey where you can submit any recommendations regarding this proposed research.

How to submit: this is online survey conducted through SurveyMonkey. After you have completed the survey, press the submit button.

SECTION 1: Personal Data

1. What is your city of residency?

- Riyadh Jeddah Mecca Medina Buraidah Dammam
 Tabuk Khobar Unaizah Taif Other

2. What is your age?

- 18- 28 years 29-39 years 39-49 years 50-60 years 61-over

3. Please specify the eGovernment services you use?

- eHealth eTax student loan Family tax benefits Interior Ministry e-services

Other

4. Are you satisfied with the eGovernment services you are using?

- Yes
 No

5. Do you think IS and Government alignment is important for the betterment of Government services?

- Strongly disagree Disagree Neutral Agree Strongly agree

SECTION 2: Benefits of alignment for eGovernment services

1 What do you think successful alignment between government needs and information system services can achieve?

| <i>Benefits</i> | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Improved communication level within the Government organizations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Improved communication between business and IS executives | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Support of informal business and IS structures | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Support of informal business and IS strategy | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Improved management skills among IS staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Improved use of IS within the eGovernment organizations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Improved performance of business managers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Improved Government revenue proofread | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Reduction in the IS investment cost | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Reduction in the overall investment cost | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| An increases the eGovernment organizations product quality | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| A positive influence on the IS belief of business executives and managers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 3: Factors that promote strong alignment in the eGovernment sector. Strategic, Structural, Social and Cultural alignment

1. How important are the following factors for achieving strategic alignment between government needs and IS services?

| <i>Issues</i> | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| eGovernment strategy must be aligned with IS strategy. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| IS strategy must be aligned with eGovernment strategy. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| eGovernment plan must be aligned with IS plan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| eGovernment must consider IS as assert not tool and invest enough in IS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| eGovernment strategy unclear among IS staff and vice versa | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Strategic alignment between IS and other agencies in eGovernment is very important | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. How important are the following factors for achieving structural alignment between Government needs and IS services?

| <i>Issues</i> | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| eGovernment structure flexible to support alignment with IS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| IS department structure should have suitable resources to support eGovernment goal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Complex eGovernment structure could lead to non-alignment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lack of IS department support or investment could lead to non-alignment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| eGovernment formal structure could lead to lack of technological support from IS department | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Structural alignment between IS and other agencies in eGovernment is very important | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. How important are the following factors for achieving social alignment between government needs and IS services?

| <i>Issues</i> | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| IS department and other eGovernment agencies should share domain knowledge for the stronger alignment between both. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| IS department planning must align with eGovernment planning so that IS support Government goals | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| CEOs and CIO from IS department should have long term relationships and planning so that alignment can be achieved | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Strong alignment required close relationship between IS department staff and staff from other Government agencies | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Social alignment between IS and other agencies in eGovernment is very important | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. How important are the following factors in achieving cultural alignment between government needs and IS services?

| <i>Issues</i> | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| The eGovernment top management should be involved in IS planning to support cultural alignment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Better communication between IS department and other agencies in the eGovernment could improve alignment between both. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Strong working relationship between IS department and other agencies help to improve cultural alignment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| IS department should culturally mature to support Government goals | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Effective and helpful leadership of IS department and other agencies in the eGovernment could improve cultural alignment in the Government infrastructure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Cultural alignment between IS and other agencies in eGovernment is very important | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

SECTION 4: Feedback

If you think that we have missed any important factors in the context of identifying the ideal pattern of alignment, please specify here.

| |
|---|
| <div style="background-color: #cccccc; width: 20px; height: 10px; margin-bottom: 5px;"></div> |
|---|

تحسين خدمات الحكومة الإلكترونية من خلال المواءمة بين الأعمال / نظم المعلومات في
المملكة العربية السعودية

التي أجرتها

جامعة بليموث

ملاحظة للمرسل إليه

ستسهم ملاحظتكم بشكل كبير في بحث الدكتوراه الحالي وستبقى في سرية تامة. ويعد هذا الاستبيان جزء من برنامج الدكتوراه في كلية إدارة الأعمال بجامعة بليموث، المملكة المتحدة، والغرض منه المساعدة في دراسة عملية المواءمة في سياق تحسين خدمات الحكومة الإلكترونية في المملكة العربية السعودية.

في حال وجود أي أسئلة أو استفسارات حول هذه الدراسة أو البحث بشكل عام، يرجى الاتصال بالسيد سليمان الفاضل، الدراسات العليا بكلية الإدارة (كلية إدارة الأعمال)، جامعة بليموث، المملكة المتحدة عبر عنوان البريد الإلكتروني sulaiman.alfadhel@plymouth.ac.uk. لن تستغرق الإجابة على هذا الاستبيان سوى حوالي 10 إلى 15 دقيقة.

في حال عدم قدرتك أو عدم رغبتك الإجابة على أي جزء من هذا الاستبيان اتركه فارغاً، كما يمكنك طرح أي توصيات بخصوص هذا المقترح البحثي في القسم المخصص لذلك في نهاية هذا الاستبيان .

طريقة تقديم الاستبيان: هذا الاستبيان مصمم إلكترونياً عبر موقع SurveyMonkey, يرجى الإجابة عليه والضغط على زر تقديم.

القسم الأول: البيانات الشخصية

1- ما اسم المدينة التي تقيم فيها؟

الرياض جدة مكة المدينة بريدة الدمام تبوك

الخبر عنيزة الطائف أخرى

2- ما عمرك؟

18-28 عام 29-39 عام 39-49 عام 50-60 عام 61- لأعلى

3- يرجى تحديد خدمات الحكومة الإلكترونية التي تستخدمها؟

الصحة الإلكترونية الضرائب الإلكترونية الفروض الطلابية المزايا الضريبية التي تمنح للأسر الخدمات الإلكترونية لوزارة الداخلية أخرى

4- هل أنت راضٍ عن خدمات الحكومة الإلكترونية التي تستخدمها

نعم

لا

5- هل تعتقد أن الموازنة بين نظم المعلومات والحكومة أمر هام لتحسين الخدمات الحكومية؟

لا أوافق بشدة لا أوافق محايد أوافق أوافق بشدة

القسم الثاني: فوائد الموازنة على خدمات الحكومة الإلكترونية

1- في رأيك، ما الذي يمكن أن تحققه الموازنة الناجحة بين احتياجات الحكومة وخدمات نظم المعلومات؟

| المزايا | لا أوافق بشدة | لا أوافق | محايد | أوافق | أوافق بشدة |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| تحسين مستوى التواصل داخل المؤسسات الحكومية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تحسين التواصل بين المؤسسات التجارية والمديرين التنفيذيين لنظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| دعم هيكل المؤسسات التجارية غير الرسمية ونظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| دعم استراتيجية المؤسسات التجارية غير الرسمية ونظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تحسين المهارات الإدارية بين العاملين في نظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تحسين استخدام نظم معلومات داخل مؤسسات الحكومة الإلكترونية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تحسين أداء مديري الأعمال | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تحسين الإيرادات الحكومية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تخفيض تكلفة الاستثمار في نظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تخفيض التكلفة الإجمالية للاستثمار | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تحسين جودة منتجات المؤسسات في الحكومة الإلكترونية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تأثير إيجابي على مفهوم نظم المعلومات بين المديرين والمديرين التنفيذيين للمؤسسات التجارية. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

القسم الثالث: العامل الذي يعزز الموازنة الفعالة في قطاع الحكومة الإلكترونية. الموازنة الاستراتيجية والهيكلية والاجتماعية والثقافية

1- ما مدى أهمية العوامل التالية لتحقيق الموازنة الاستراتيجية بين احتياجات الحكومة وخدمات نظم المعلومات؟

| المشكلة | لا أوافق بشدة | لا أوافق | محايد | أوافق | أوافق بشدة |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| يجب موازنة استراتيجية الحكومة الإلكترونية مع استراتيجية نظم المعلومات. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يجب موازنة استراتيجية نظم المعلومات مع استراتيجية الحكومة الإلكترونية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يجب أن تتماشى خطة الحكومة الإلكترونية مع خطة نظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يجب أن تنظر الحكومة الإلكترونية إلى نظم المعلومات باعتباره ضرورة حتمية وليس مجرد أداة فحسب، كما يجب عليها الاستثمار بصورة كافية فيه | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| استراتيجية الحكومة الإلكترونية غير واضحة بين موظفي نظم المعلومات والعكس بالعكس | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| إن الموازنة الاستراتيجية بين نظم المعلومات والهيئات الأخرى في الحكومة الإلكترونية هامة للغاية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2- ما مدى أهمية العوامل التالية لتحقيق الموازنة الهيكلية بين احتياجات الحكومة وخدمات نظم المعلومات؟

| المشكلة | لا أوافق بشدة | لا أوافق | محايد | أوافق | أوافق بشدة |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| إن هيكل الحكومة الإلكترونية مرن لدعم الموازنة مع نظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يجب أن يحتوي هيكل إدارة نظم المعلومات على الموارد المناسبة لدعم هدف الحكومة الإلكترونية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| قد تؤدي البنية المعقدة للحكومة الإلكترونية إلى عدم الموازنة | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| قد يؤدي عدم وجود دعم أو استثمار في إدارة نظم المعلومات إلى عدم الموازنة | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| قد يتسبب الهيكل الرسمي للحكومة الإلكترونية في نقص الدعم التكنولوجي من قسم نظم المعلومات | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| إن الموازنة الهيكلية بين نظم المعلومات والهيئات الأخرى في الحكومة الإلكترونية مهمة للغاية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3- ما مدى أهمية العوامل التالية لتحقيق الموازنة الاجتماعية بين احتياجات الحكومة وخدمات نظم المعلومات؟

| المشكلة | لا أوافق بشدة | لا أوافق | محايد | أوافق | أوافق بشدة |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ينبغي على إدارة نظم المعلومات والهيئات الحكومية الأخرى مشاركة المجال المعرفي لتحقيق موازنة أفضل بينهم. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يجب أن يتوافق تخطيط إدارة نظم المعلومات مع التخطيط الحكومي الإلكترونية بحيث يدعم نظام المعلومات أهداف الحكومة | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يجب أن يتمتع المديرين التنفيذيين ورئيس قسم المعلومات بقسم نظم المعلومات بعلاقات وتخطيط على المدى الطويل حتى يمكنهم تحقيق الموازنة | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | تتطلب الموازنة القوية وجود علاقة وثيقة بين موظفي إدارة نظم المعلومات وموظفي الهيئات الحكومية الأخرى |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | إن الموازنة الاجتماعية بين نظم المعلومات والهيئات الأخرى في الحكومة الإلكترونية مهمة للغاية |

4- ما مدى أهمية العوامل التالية لتحقيق الموازنة الثقافية بين احتياجات الحكومة وخدمات نظم المعلومات؟

| المشكلة | لا أوافق بشدة | لا أوافق | محايد | أوافق | أوافق بشدة |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| يجب أن تشارك الإدارة العليا للحكومة الإلكترونية في تخطيط نظم المعلومات التي تدعم الموازنة الثقافية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| إن تحسين التواصل بين إدارة نظم المعلومات والهيئات الأخرى في الحكومة الإلكترونية من شأنه أن يحسن الموازنة بينهم. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| تساهم علاقة العمل القوية بين إدارة نظم المعلومات والهيئات الأخرى في تحسين الموازنة الثقافية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ينبغي على إدارة نظم المعلومات أن تتطور ثقافياً لدعم أهداف الحكومة | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| يمكن أن تؤدي القيادة الفعالة والمفيدة لقسم نظم المعلومات والهيئات الأخرى في الحكومة الإلكترونية إلى تحسين الموازنة الثقافية في البنية التحتية الحكومية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| إن الموازنة الثقافية بين نظم المعلومات والهيئات الأخرى في الحكومة الإلكترونية هام للغاية | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

القسم الرابع: الملاحظات

إذا لاحظت غياب أي من العوامل الهامة في سياق تحديد النمط الأمثل للموازنة، يرجى ذكرها هنا.

Appendix B: Research information sheet, English, Arabic and Ethic approval

Research information sheet

1. Research Project Title:

Improving e-Government services through business/IS alignment in Saudi Arabia

2. Research Invitation

You are being asked to take part in a research study on “Improving e-Government Services in Saudi Arabia”. Before you decide whether or not to participate, it is important that you understand why the research is being done and what it will involve. This information sheet explains the aims of the study. If there is anything that is unclear, or if you would like more information, please ask us. Your participation in this study is entirely voluntary.

3. What is the aim of this study?

The aim of this research is to study the process of alignment of business and information systems in the context of improving e-government services in Saudi Arabia.

3.1. What is alignment and its pattern?

The process of alignment between businesses and information systems involves two key questions: how does the information system align with the business environment? And how does the business organizational environment align with the information system environment within the business organization? Therefore, alignment consists of two elementary concepts, namely business planning and information system planning. In this study, we focus on four patterns of alignment, which are as follows: 1) Strategic alignment is the degree to which the IS objectives, mission statement and plans support and are supported by the business organizational objectives, mission statement, and plans; 2) Structural alignment is a method within which organizations, departments, people and functions are linked and are interrelated with each other in order to attain common business goals; 3) Culture is made up of a variety of different individuals, where every individual uses specific emotional drives to achieve goals and objectives through work. But everybody’s goals are different, objectives are different, emotional drives are different. This mixture of people with different emotions may affect the overall performance of the business organization, therefore it is important for organizations to have strong leadership that aligns all of these individuals in a way to achieve business goals and objectives effectively; 4) The social dimension of alignment in the business environment contains several components such as taxes, organizational lifestyles, and

the standards that describe the society in which the business organization operates. This dimension impacts the ability of the business organization to gain resources, services, and functions that improve organizational performance

4. Why have I been chosen?

You have been chosen because we believe that you have the right user in the areas of e-Government and Information System Alignment. We also believe that the findings from this will have useful implications for e-Government services which you might be interested in as a normal user of eGovernment.

5. Do I have to take part?

No. It is up to you to decide whether or not you wish to participate in this study. Your participation is entirely voluntary. If you agree to take part, we will then ask you to sign a consent form. You are free to withdraw any time before 31/03/2018, without giving a reason.

6. What will happen to me if I take part?

If you choose to take part in this study, we will be asking for your opinion on e-Government services and Information System Alignment through one or two of the following ways: if we approach you for our quantitative study, we will send you a study questionnaire in Arabic and filling in that questionnaire should take no longer than 30 minutes.

7. What are the possible benefits of taking part?

By participating in this study you will help to improve our understanding of the e-Government services in Saudi Arabia. You will have the opportunity to provide your opinion as a user on current e-Government services. The information we collect from you will contribute to our project samples and reach findings about improving e-Government services. If you are interested, we would be happy to provide you with a summary of research findings.

8. Will my taking part in this project be kept confidential?

All information collected about you during the project will be kept strictly confidential. You will not be able to be identified in any reports or publications. None the less, the name of your agencies may be acknowledged in the publications where appropriate with your permission.

9. Will I be recorded, and how will the recorded media be used?

Your response will be stored securely in electronic format.

10. Who is organising and funding the research?

The Government of Saudi Arabia.

11. Contact for further information

If you have any questions, please do not hesitate to contact PhD student Sulaiman Alfadhel Email: (sulaiman.alfadhel@plymouth.ac.uk).

If you are dissatisfied with the way the research is conducted, please contact the Director of Studies in the first instance: shaofeng.liu@plymouth.ac.uk If you feel the problem has not been resolved please contact the Faculty of Business Research Ethics Committee: FOBResearch@plymouth.ac.uk

الملف الخاص بمعلومات البحث

1- عنوان المشروع البحثي:

تحسين خدمات الحكومة الإلكترونية من خلال مواءمة الأعمال / نظم المعلومات في المملكة العربية السعودية.

2- دعوة البحث

تكمّن مهمتك في المشاركة في دراسة بحثية عن "تحسين خدمات الحكومة الإلكترونية في المملكة العربية السعودية". قبل أن تقرر ما إذا كنت ستشارك أم لا، من المهم أن تدرك ما السبب وراء إجراء هذا البحث وما سوف ينطوي عليه. ويشرح هذا الملف الخاص بمعلومات البحث أهداف الدراسة. إذا كان هناك أي شيء غير واضح، أو إذا كنت ترغب في مزيد من المعلومات، يرجى الاتصال بنا. مشاركتك في هذه الدراسة طوعية تماما.

3- ما الهدف من هذه الدراسة

إن الهدف من هذا البحث هو دراسة عملية مواءمة الأعمال ونظم المعلومات في سياق تحسين خدمات الحكومة الإلكترونية في المملكة العربية السعودية.

1-3- ما المقصود بالمواءمة وماهي أنماطها

تتضمن عملية المواءمة بين الأعمال ونظم المعلومات سؤالين رئيسيين: كيف يتتّاعم نظام المعلومات مع بيئة الأعمال؟ وكيف تتماشى البيئة التنظيمية للأعمال مع بيئة نظام المعلومات داخل مؤسسة الأعمال؟ لذلك، تتكون المواءمة من مفهومين أساسيين هما تخطيط الأعمال وتخطيط نظام المعلومات. وفي هذه الدراسة نركز على أربعة أنماط من المالمواءمة، وهي على النحو التالي: (1) المواءمة الاستراتيجية هي درجة أهداف نظام المعلومات، وبيان المهمة ودعم خططها والتي تدعمها أهداف المؤسسات، وبيان المهمة، والخطط. (2) المواءمة الهيكلية هي الطريقة التي ترتبط فيها المؤسسات والإدارات والأشخاص والوظائف وتترابط مع بعضها البعض من أجل تحقيق أهداف الأعمال المشتركة (3) أما المواءمة الثقافية فإنها تتكون من مجموعة متنوعة من الأفراد المختلفة، حيث يستخدم كل فرد محركات عاطفية محددة لتحقيق الأهداف والغايات من خلال العمل. ولكن كل منهم له هدف ، وغاية ، ومحركات عاطفية مختلفة. وقد يؤثر هذا الخليط من الأشخاص ذوي المشاعر المختلفة على الأداء العام للمؤسسات، ولذلك فمن المهم أن تكون لدى هذه المؤسسات قيادة قوية تواءم بين هؤلاء الأفراد جميعهم بطريقة تحقق أهداف العمل وغاياته بفعالية (4) يتضمن

البعد الاجتماعي للموامة في بيئة الأعمال العديد من المكونات مثل الضرائب وأنماط الحياة للمؤسسات والمعايير التي تصف المجتمع الذي تعمل في ه مؤسسة الأعمال. ويؤثر هذا البعد على قدرة المؤسسات على الحصول على الموارد والخدمات والوظائف التي تحسن الأداء التنظيمي.

4- لما تم اختياري؟

لقد تم اختيارك لأننا نعتقد أن لديك المستخدم المناسب في مجالات الحكومة الإلكترونية وموامة نظم المعلومات. كما نعتقد أيضا أن نتائج هذا البحث ستكون لها آثار إيجابية على خدمات الحكومة الإلكترونية التي قد تكون تهتمك بصفتك مستخدم عادي لهذه الخدمات.

5- هل يجب علي المشاركة؟

لا، أنت بالخيار لتقرر ما إذا كنت ترغب في المشاركة في هذه الدراسة أم لا، حيث أن مشاركتك طوعية تماما. وإذا وافقت على المشاركة، سوف نطلب منك بعد ذلك توقيع استمارة الموافقة. ويمكنك الانسحاب في أي وقت قبل 2018/03/31، دون إبداء أي أسباب.

6- ماذا سيحدث لي إذا شاركت؟

إذا اخترت المشاركة في هذه الدراسة، فإننا سوف نطلب رأيك في خدمات الحكومة الإلكترونية وموامة نظام المعلومات من خلال إحدى الطريقتين التاليتين: في حال اخترناك لدراستنا الكمية، سوف نرسل لك دراسة استبيان باللغة العربية لن يستغرق ملؤه أكثر من 30 دقيقة.

7- ما هي الفوائد المحتملة الناتجة عن هذه المشاركة؟

إن مشاركتك في هذه الدراسة سوف تساهم في تحسين إدراكنا لخدمات الحكومة الإلكترونية في المملكة العربية السعودية. حيث ستتاح لك الفرصة لتقديم رأيك كمستخدم لخدمات الحكومة الإلكترونية الحالية. وستساهم المعلومات التي نحصل عليها منك في عينات مشاريعنا والتوصل إلى نتائج حول تحسين خدمات الحكومة الإلكترونية. وإذا كنت مهتما بذلك، سيكون من دواعي سرورنا أن نقدم لكم ملخصا لنتائج هذا البحث.

8- هل ستكون مشاركتي في هذا المشروع سرية؟

ستظل جميع المعلومات التي تم جمعها عنك خلال هذا المشروع سرية للغاية. ولن يتم الإشارة إليك في أي تقارير أو منشورات. ولكن، قد يتم الإفصاح عن اسم الهيئة الخاصة بك في المنشورات عند الحاجة وبعد أخذ الإذن منكز

9- هل سيتم تسجيل مشاركتي عبر مسجل صوتي؟ وكيف سيتم استخدام هذه المادة المسجلة؟

سيتم الاحتفاظ باجابتك بأمان في شكل إلكتروني.

10- ما اسم الجهة الراعية لهذا البحث والممولة له؟

الحكومة السعودية

11- وسائل الاتصال للمزيد من المعلومات

إذا كان لديك أي أسئلة، يرجى التواصل مع طالب الدكتوراه سليمان الفضل عبر البريد الإلكتروني :
(sulaiman.alfadhel@plymouth.ac.uk).

وإذا كنت غير راضٍ عن طريقة إجراء البحث، يرجى الاتصال بمدير الدراسات أولاً:
shaofeng.liu@plymouth.ac.uk،
أما إذا كنت تشعر أن المشكلة لم يتم حلها يرجى الاتصال بلجنة أخلاقيات البحث العلمي بكلية إدارة الأعمال عبر
البريد الإلكتروني : FOBResearch@plymouth.ac.uk

Ethic approval



Ref: FREC1516.76

Date: 10 November, 2016

Dear Sulaiman,

Ethical Approval Application No: FREC1516.76

Title: Improving e-Government Services through Business / Information System Alignment

The Faculty Research Ethics Committee has considered the ethical approval form and is fully satisfied that the project complies with Plymouth University's ethical standards for research involving human participants.

Approval is for the duration of the project. However, please resubmit your application to the committee if the information provided in the form alters or is likely to alter significantly.

We would like to wish you good luck with your research project.

Yours sincerely

(Sent as email attachment)

Dr James Benhin

**Chair
Faculty Research Ethics Committee Faculty of Business**