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THE DEVELOPMENT OF A METHODOLOGY FOR THE COST JUSTIFICATION OF NEW MANUFACTURING INVESTMENTS

VESTERGAARD LARSEN, POVL CHRISTIAN

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THE DEVELOPMENT OF A METHODOLOGY FOR THE COST JUSTIFICATION OF NEW MANUFACTURING INVESTMENTS

Volume II

by

POVL CHRISTIAN VESTERGAARD LARSEN

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

DOCTOR OF PHILOSOPHY

School of Computing
Faculty of Technology

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PROFIT

The Methodology Workbook

The PROFIT Methodology Workbook and CBT.

Introduction.

The PROFIT Workbook and Computer Based Tool (CBT) has been developed to assist Small and Medium Enterprises (SMEs) to fully comprehend the Company Wide benefits to be derived from investment in new technology.

The use of consultants to assist in the analysis of manufacturing tools, techniques and technologies and the full company wide benefits and costs associated with such investment, although feasible to many large manufacturing enterprises (LME's) could prove prohibitively expensive to small and medium sized enterprises (SME's), this factor will restrict successful investment vital to their survival. SME's tend not to hire outside expertise to make good their internal lack of management in key functions. The perception amongst SME's is that consultants are expensive, are not relevant to the needs of small and medium sized firms and therefore, represent poor value for money.

The requirements that face modern manufacturing enterprises demands that a large number of improvement opportunities need to be evaluated in a restricted period of time. To ensure that the full implications of each alternative are considered and important aspects are not overlooked, a well structured approach is required. The approach must be easily understood, must make best use of valuable management time and be acceptable to a company's accountants and bankers.

The PROFIT Methodology involves five Workshops of approximately half a day each. Although the actual time taken will be dependent on individual circumstances, it is envisaged that the Methodology will be completed over a period of two weeks.

Components of the PROFIT Methodology.

Steering Committee.

A PROFIT Steering Committee is formed to ensure that the structured approach of the PROFIT Workbook is followed. Members of the Steering Committee should include:

Finance Director
PROFIT Manager
Senior Managers

It is recommended that the chief decision makers within the Company appoint the Finance Director to act as the controller of the PROFIT Methodology.

The Finance Director then appoints a PROFIT Manager to ensure the efficient and smooth running of the PROFIT Methodology and to be responsible for the data input. This is advisable as the data that will be required by the PROFIT Methodology could be financially sensitive.

The Steering Committee should include Senior Managers from all the functional areas within the Company, although not all of the selected Steering Committee will be required to attend every Workshop. To ensure the full co-operation and ultimate success of the Methodology, the commitment of Senior Management cannot be over stressed. Also at this point, Pro-forma 1 is sent to the Marketing and/or Sales Director to enable the collection of data on the Company's Sales Product range to be prepared ready for the presentation in Workshop 1.

PROFIT Workshops.

Workshops are used to generate contributions, to make decisions and complete Deliverables.

Because many of the decisions are not algorithmic, the most effective course can only be determined by generating a wide range of contributions from the individuals involved. Involvement is vitally important, for without it there can be no ownership and commitment to the solutions generated. To facilitate this process, Workshops should be conducted in a non-critical, "egoless" atmosphere in which

all present, regardless of status, feel they have a valid contribution to make to the Company's future profitability.

Deliverables.

Deliverables detail the work that must be completed before workshops conclude or work that must be completed prior to a workshop beginning. To assist in the completion of Deliverables, Toolkits and Pro-formas are used

Toolkits.

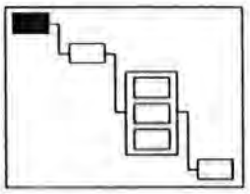
Toolkits are used to explain the methods employed in reaching agreement on the completion of the Deliverables.

Pro-formas.

Pro-formas provide the forms necessary to enter data ready to complete the Deliverables and make the calculations. Pro-formas are numbered to coincide with the data requirements of specific Deliverables. For example, Pro-forma 3 is for Deliverable 3 - even though it is the first Pro-forma.

Stage One - Launch

PROFIT Brief



Participants:

Finance Director, PROFIT Manager and PROFIT Steering Committee.

Rationale:

The PROFIT Manager assures that the Steering Committee have brought their diaries with them, to the PROFIT Brief, to aid the time tabling of future PROFIT Workshops and that Pro-forma 3 is sent out to the Marketing and/or Sales Director to enable the collection of data to be prepared on the Company's Sales Product range ready for the presentation in Workshop 1.

At the PROFIT Brief, the Finance Director and the PROFIT Manager explain the PROFIT Methodology and assign the appropriate roles to the selected Steering Committee members, Deliverable 1.

The Brief ends when the time tabling of the future PROFIT Workshops has been agreed, Deliverable 2.

Actions Required:

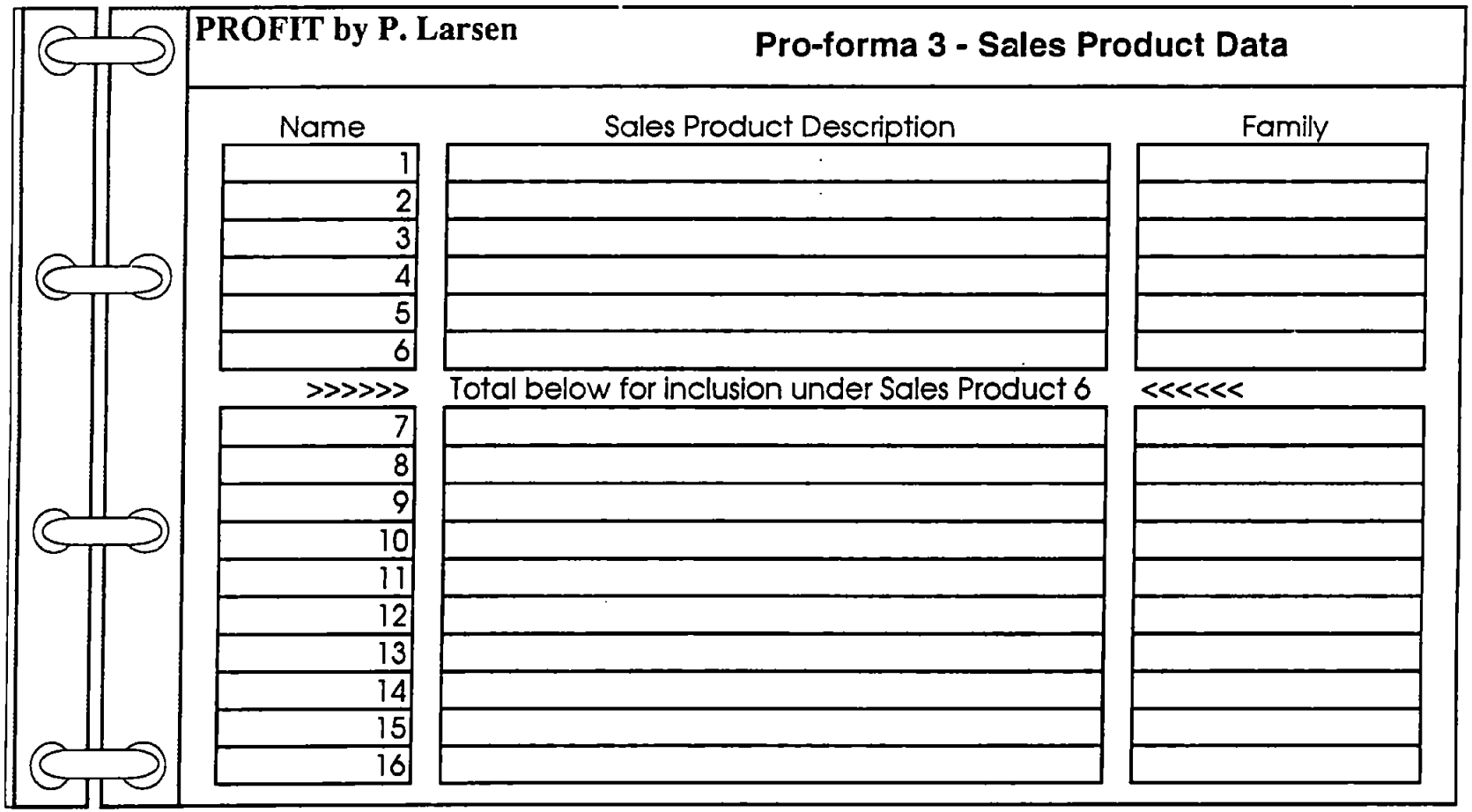
Send out:

Pro-forma 3 - Sales Product data.

Complete:

Deliverable 1 - Agreed Roles and Membership of the Steering Committee

Deliverable 2 - Agreed Timetable.



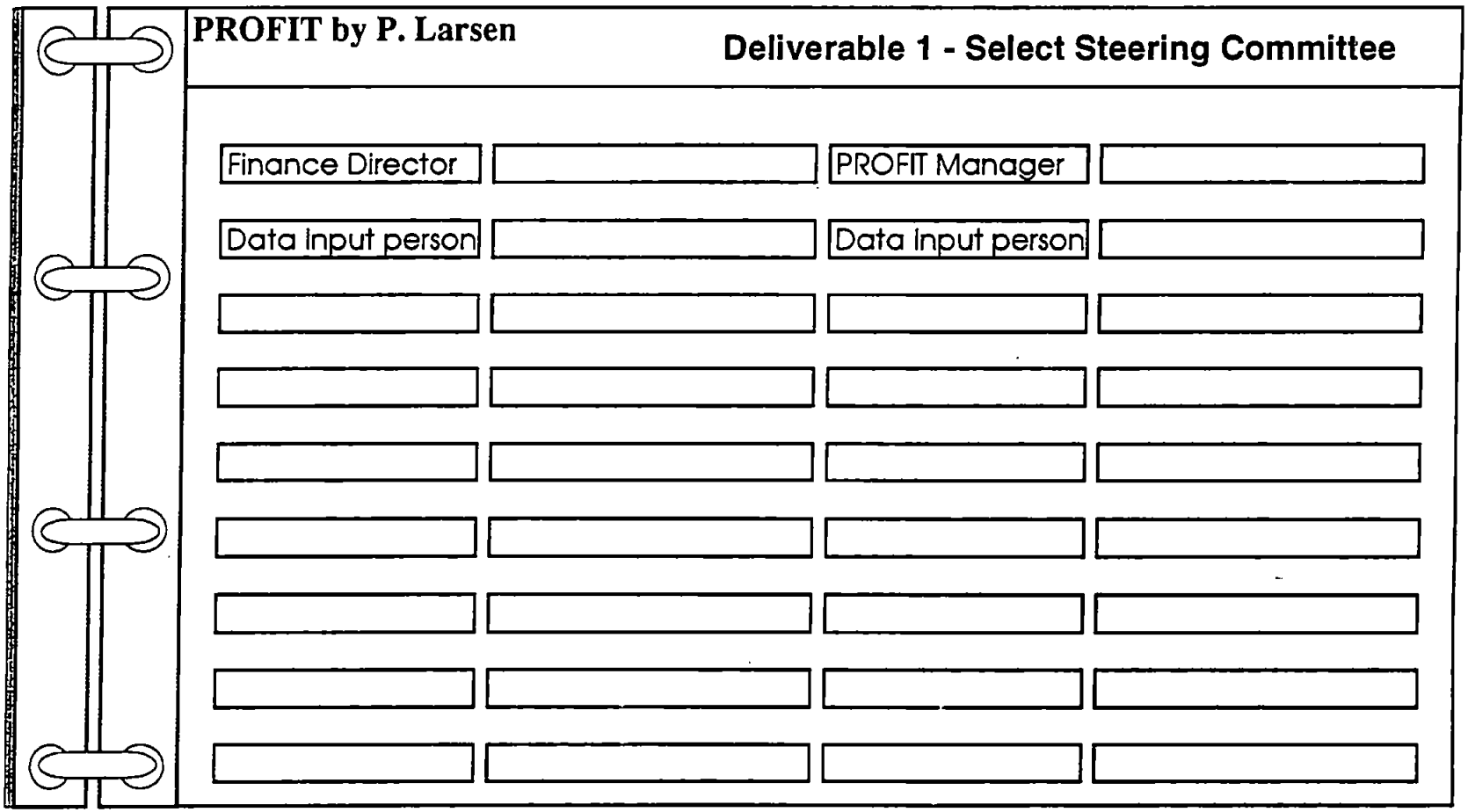
PROFIT by P. Larsen

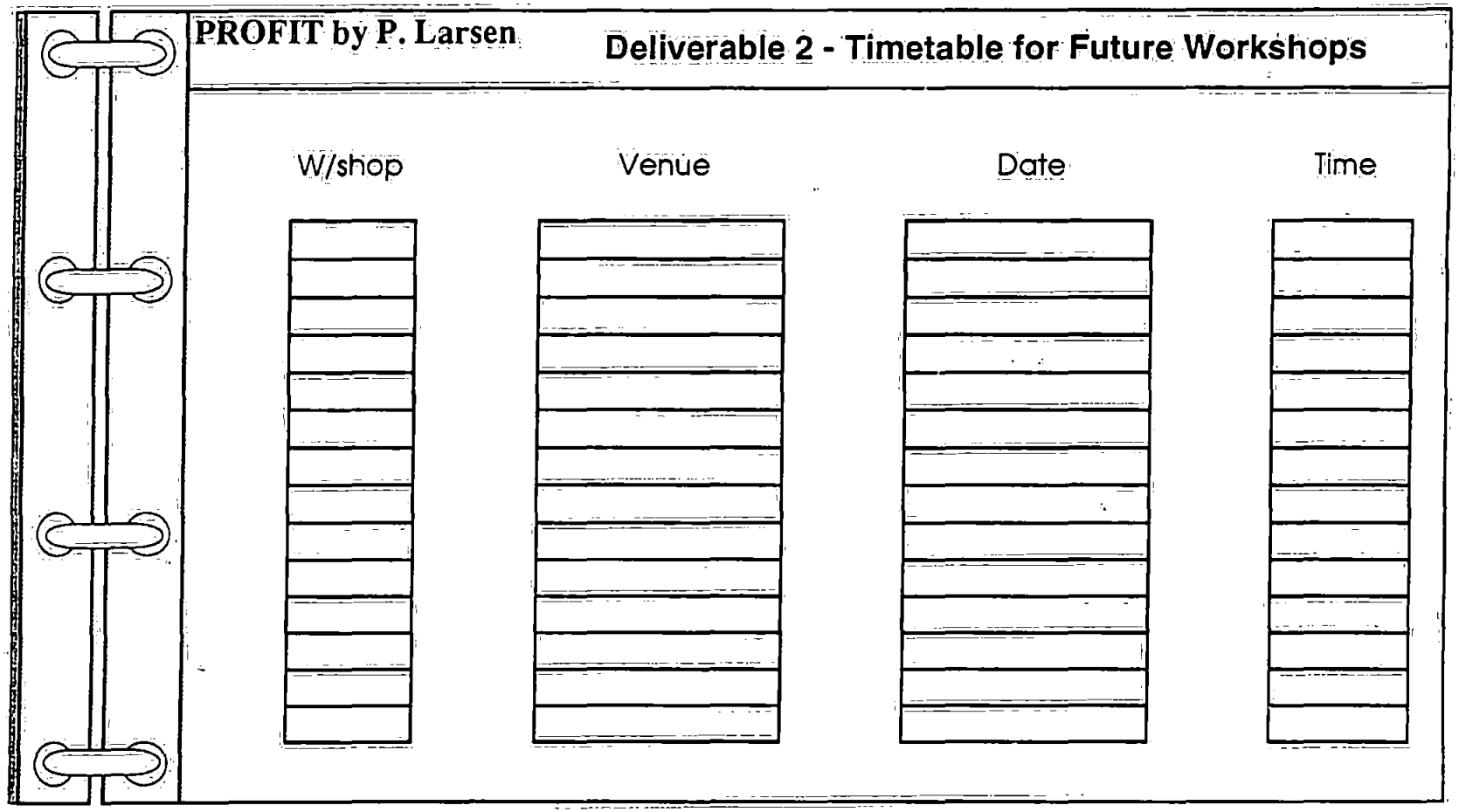
Pro-forma 3 - Sales Product Data

Name	Sales Product Description	Family
1		
2		
3		
4		
5		
6		
>>>>>>	Total below for inclusion under Sales Product 6	<<<<<<
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

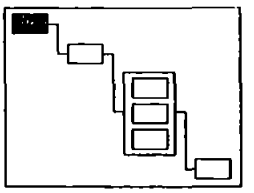
Help Screen

Please complete the above for the Sales Products selected for further analysis. Six Sales Products maximum or five Sales Products and all other Sales Products to be totalled and data entered under Sales Product six.


PROFIT by P. Larsen
Deliverable 1 - Select Steering Committee
Finance Director
PROFIT Manager
Data Input person
Data Input person


PROFIT by P. Larsen
Deliverable 2 - Timetable for Future Workshops
W/shop
Venue
Date
Time

Workshop 1



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Production and Sales.

Rationale:

The purpose of Workshop 1 is to agree on the Sales Products that are to be audited, using the data collected on Pro-forma 3. Where the product range is greater than six, agreement must be reached as to which products should be grouped into which Sales Product Families or whether PROFIT is to be repeated to allow further analysis.

Actions Required:

Complete:

Deliverable 3 - Agreed Sales Products/Sales Product Families.

Send out:

Pro-formas 4a/4b/4b2/4c - Agreed Sales Products Cost and Sales Data.

Pro-formas 5a/5b/5.1b/5b2/5c/5c2 - for Expected, Optimistic and Pessimistic Scenario Cost and Sales Analysis Data.

Complete prior to Workshop 2:

Deliverable 4 - Revenue and Cost Data for Selected Sales Products and build a model of the current financial status.

Deliverable 5 - Scenario Analysis Data for Selected Sales Products, for the three scenarios and build a model of the three future financial scenarios.

Toolkit 1.

Sales Product Data.

Pro-forma 3 requires collecting data on the sales products of the Company, in order to enable the Steering Committee to agree on the sales products to be audited in Workshop 1. Decisions will also need to be made as to whether or not to group sales products into sales product families.

Identifying Sales Products to audit.

The identification of Sales Products is to a degree dependent on the evaluation option that will be selected in Stage Three.

If no proposal for investment in new technology, nor the business need is known then the Steering Committee is advised to consider which term they are interested in, the short, medium or long. Then to look at the Sales Products that are going to contribute to the profitability of the Company for whichever period they have agreed.

If the business need is known but not any proposals then Sales Products that offer the best potential to meet the business need should be selected. The audit can be rerun (limited only by time and financial constraints) to include all of a company's products.

If there are one or more proposals to evaluate and the business need is known then the Steering Committee should select those Sales Products that are affected by the proposals.

Sales Product Families are Products that are sold to a particular set of customers. For example:

> A manufacturer of electrical goods could form product families based on functionality, such as, washing machines, tumble dryers, freezers, etc.,

A car manufacturer might sell his products based on Economy, Standard and Luxury models.

Sales Product Families or Groups.

The term 'Sales Products' will be used throughout the methodology but can be read as Sales Product Families, where applicable.

Deliverables 4 and 5.

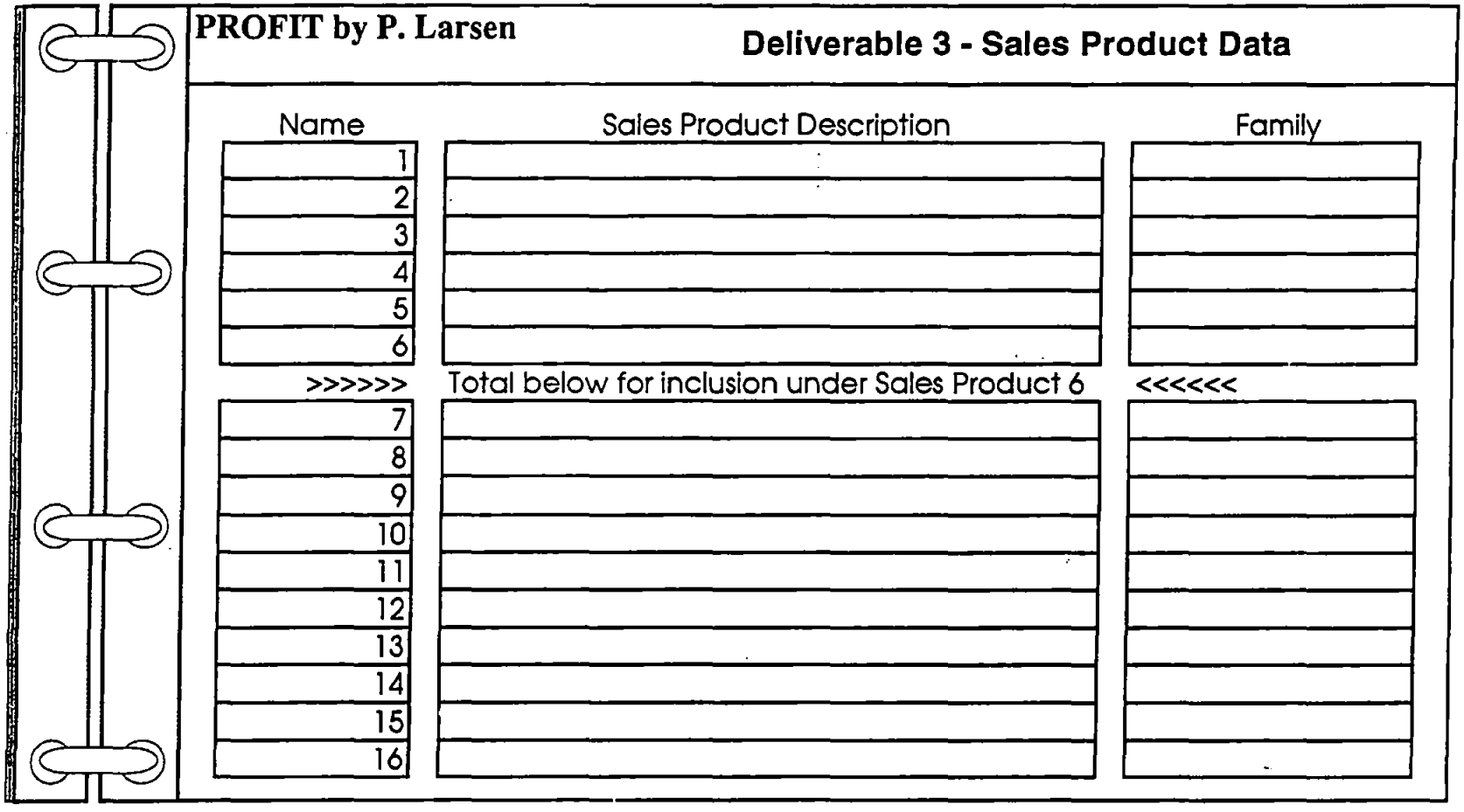
Enter the data in cells that have a solid outline. The cells with a dotted outline in the CBT are protected and will not accept data. Any calculations necessary will be carried out by the CBT. If you are not using the CBT, Toolkits 3.1, 3.2 and 3.3 provide the necessary guidance to carry out the calculations.

Deliverable 4.

Input the data collected using the Pro-formas 4a/4b/4b2/4c, for the Sales Products agreed to in Deliverable 3, into Deliverable 4's Production, Profit and Loss Account.

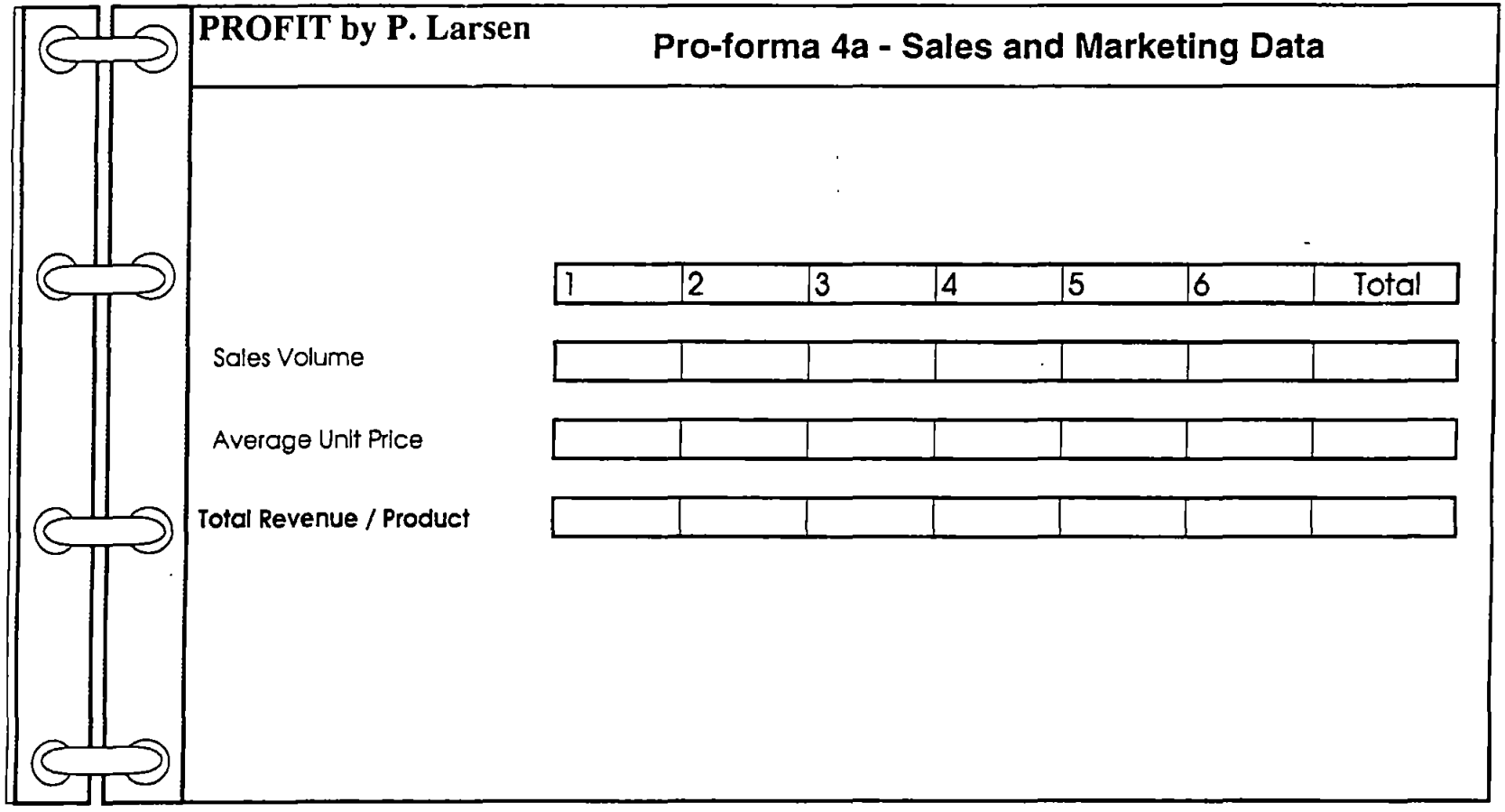
Deliverable 5

Input the Scenario Analysis data collected using the Expected, Optimistic and Pessimistic Pro-formas 5a/5b/5.1b/5b2/5c/5c2, for the Sales Products agreed to in Deliverable 3, into Deliverable 5's Production, Profit and Loss Account, for the three scenarios



Help Screen

Please complete the above for the Sales Products selected for further analysis. Six Sales Products maximum or five Sales Products and all other Sales Products to be totalled and data entered under Sales Product six.



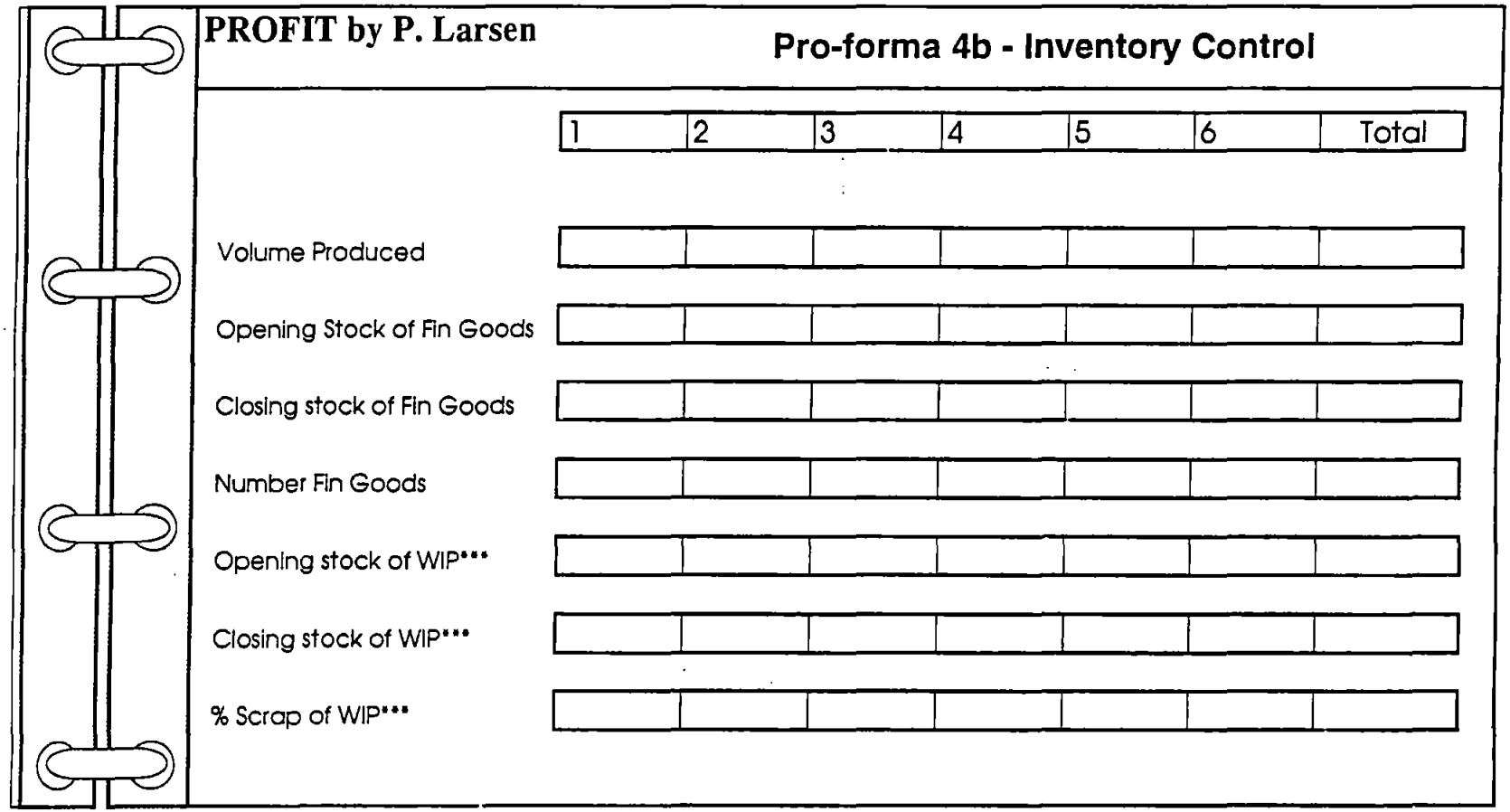
PROFIT by P. Larsen

Pro-forma 4a - Sales and Marketing Data

	1	2	3	4	5	6	Total
Sales Volume							
Average Unit Price							
Total Revenue / Product							

Help Screen

Please complete the above for the Sales Products selected for further analysis. Six Sales Products maximum or five Sales Products and all other Sales Products to be totalled and data entered under Sales Product six.



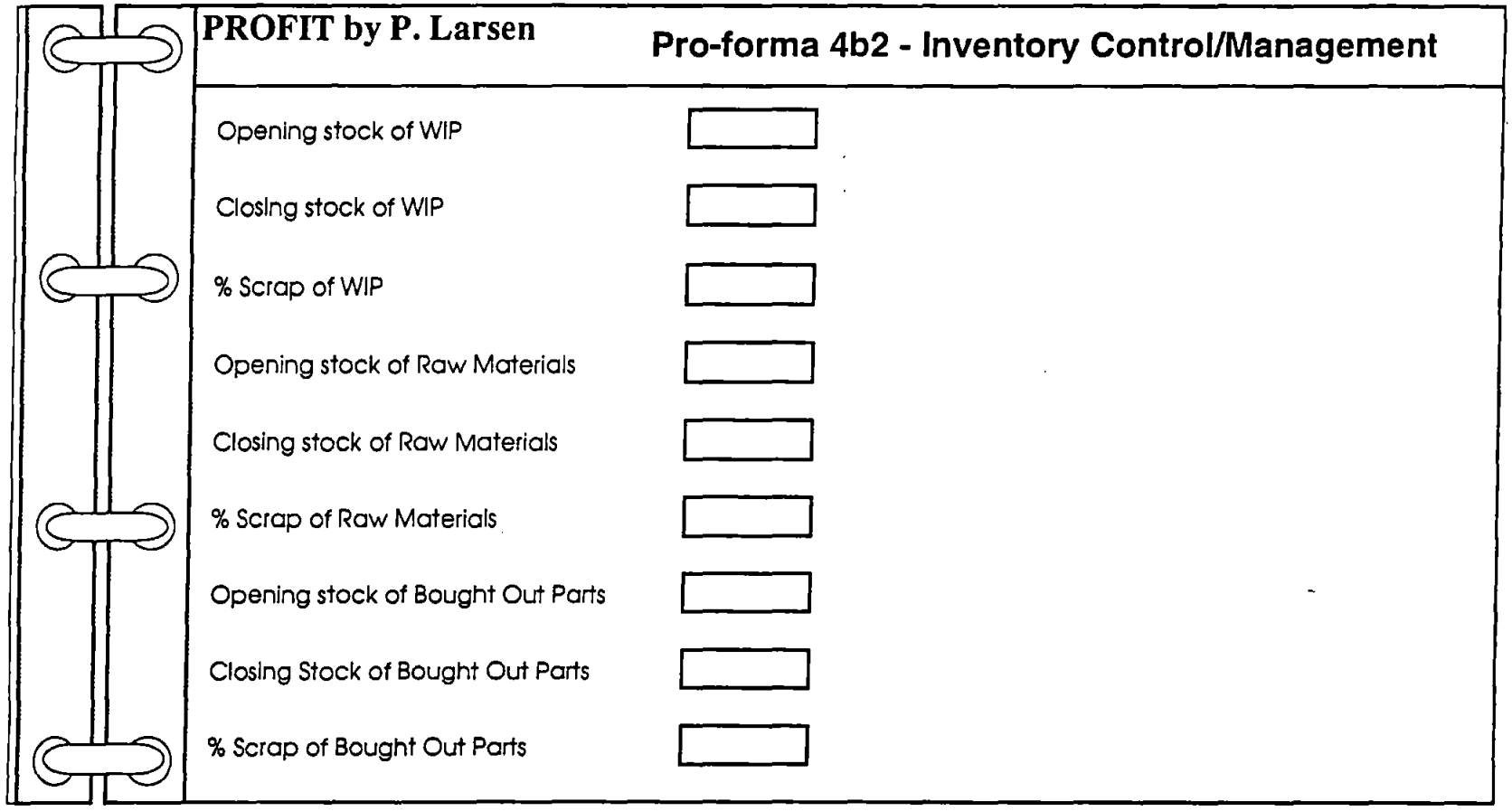
PROFIT by P. Larsen

Pro-forma 4b - Inventory Control

	1	2	3	4	5	6	Total
Volume Produced							
Opening Stock of Fin Goods							
Closing stock of Fin Goods							
Number Fin Goods							
Opening stock of WIP***							
Closing stock of WIP***							
% Scrap of WIP***							

Help Screen

Please complete the above for the Sales Products selected for further analysis. Six Sales Products maximum or five Sales Products and all other Sales Products to be totalled and data entered under Sales Product six. For *** If WIP per Sales Product is not known, then enter Lump Sum on Pro-forma 4b2.



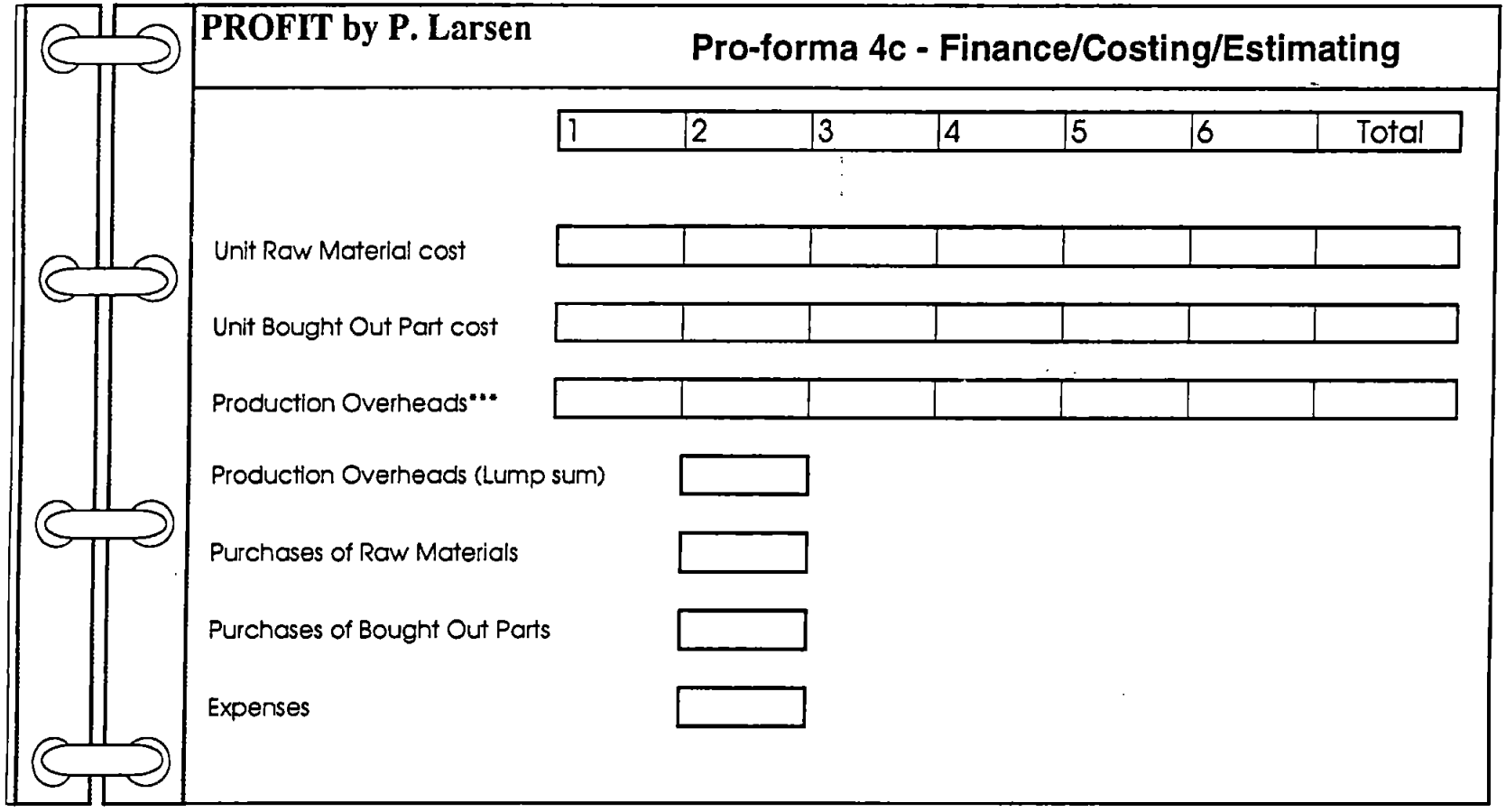
PROFIT by P. Larsen

Pro-forma 4b2 - Inventory Control/Management

Opening stock of WIP	
Closing stock of WIP	
% Scrap of WIP	
Opening stock of Raw Materials	
Closing stock of Raw Materials	
% Scrap of Raw Materials	
Opening stock of Bought Out Parts	
Closing Stock of Bought Out Parts	
% Scrap of Bought Out Parts	

Help Screen

Please complete the above on a Company Wide basis. That is, enter a lump sum.



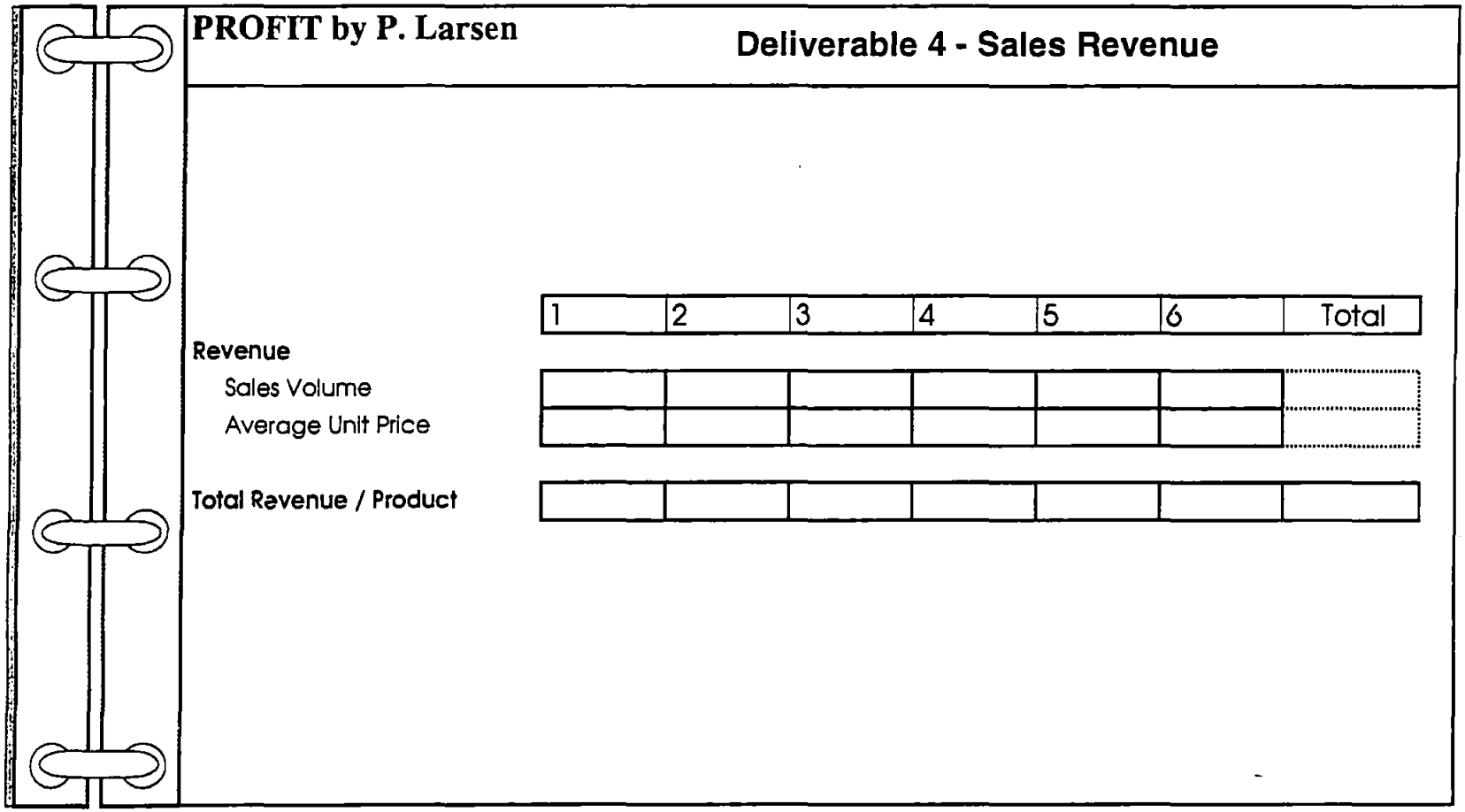
PROFIT by P. Larsen

Pro-forma 4c - Finance/Costing/Estimating

	1	2	3	4	5	6	Total
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
Production Overheads (Lump sum)							
Purchases of Raw Materials							
Purchases of Bought Out Parts							
Expenses							

Help Screen

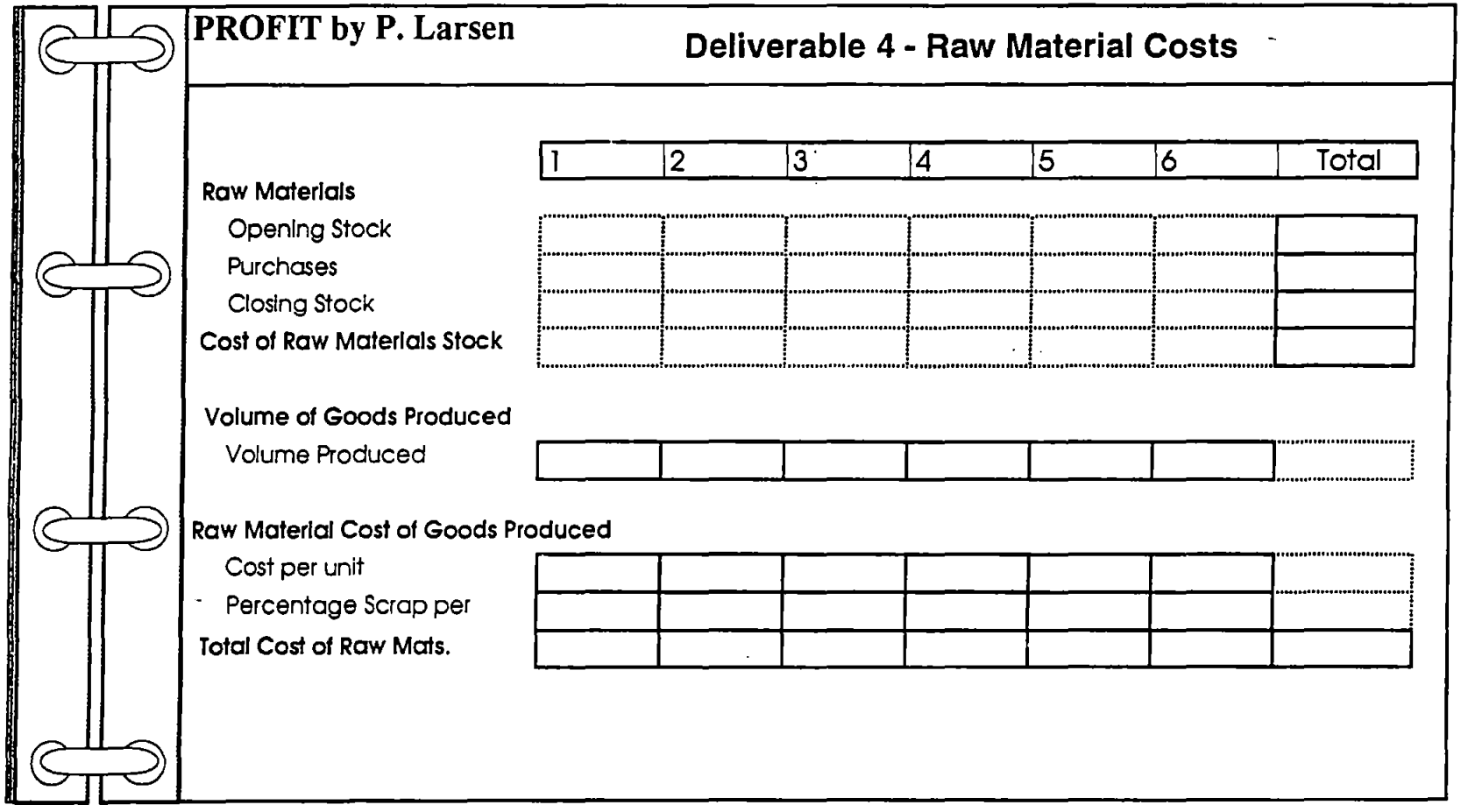
Please complete the above for the Sales Products and on a Company Wide basis. Six Sales Products maximum or five Sales Products and all other Sales Products to be totalled and data entered under Sales Product six. For *** If Production Overheads per Sales Product is not known, then enter Lump Sum.



PROFIT by P. Larsen

Deliverable 4 - Sales Revenue

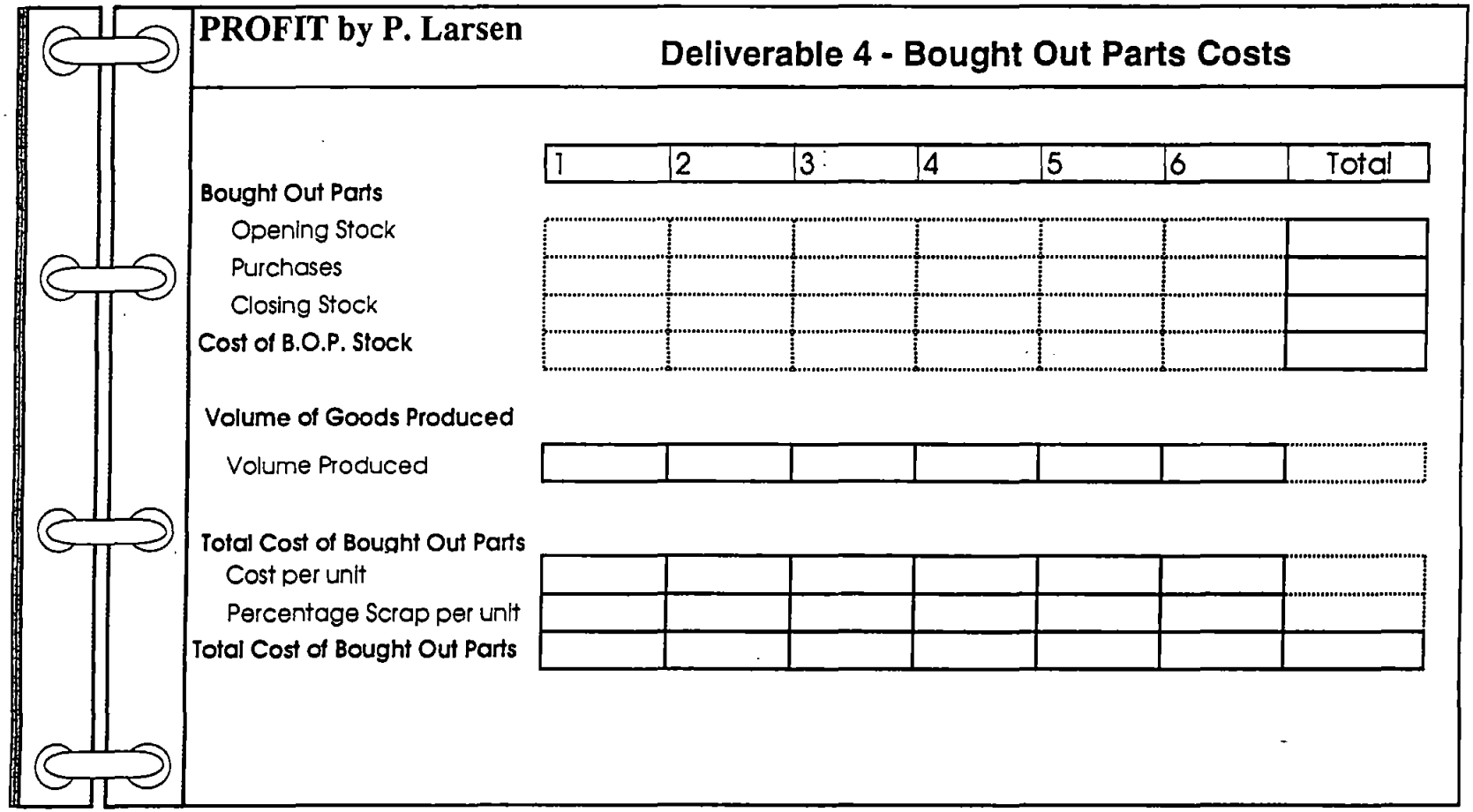
	1	2	3	4	5	6	Total
Revenue							
Sales Volume							
Average Unit Price							
Total Revenue / Product							



PROFIT by P. Larsen

Deliverable 4 - Raw Material Costs

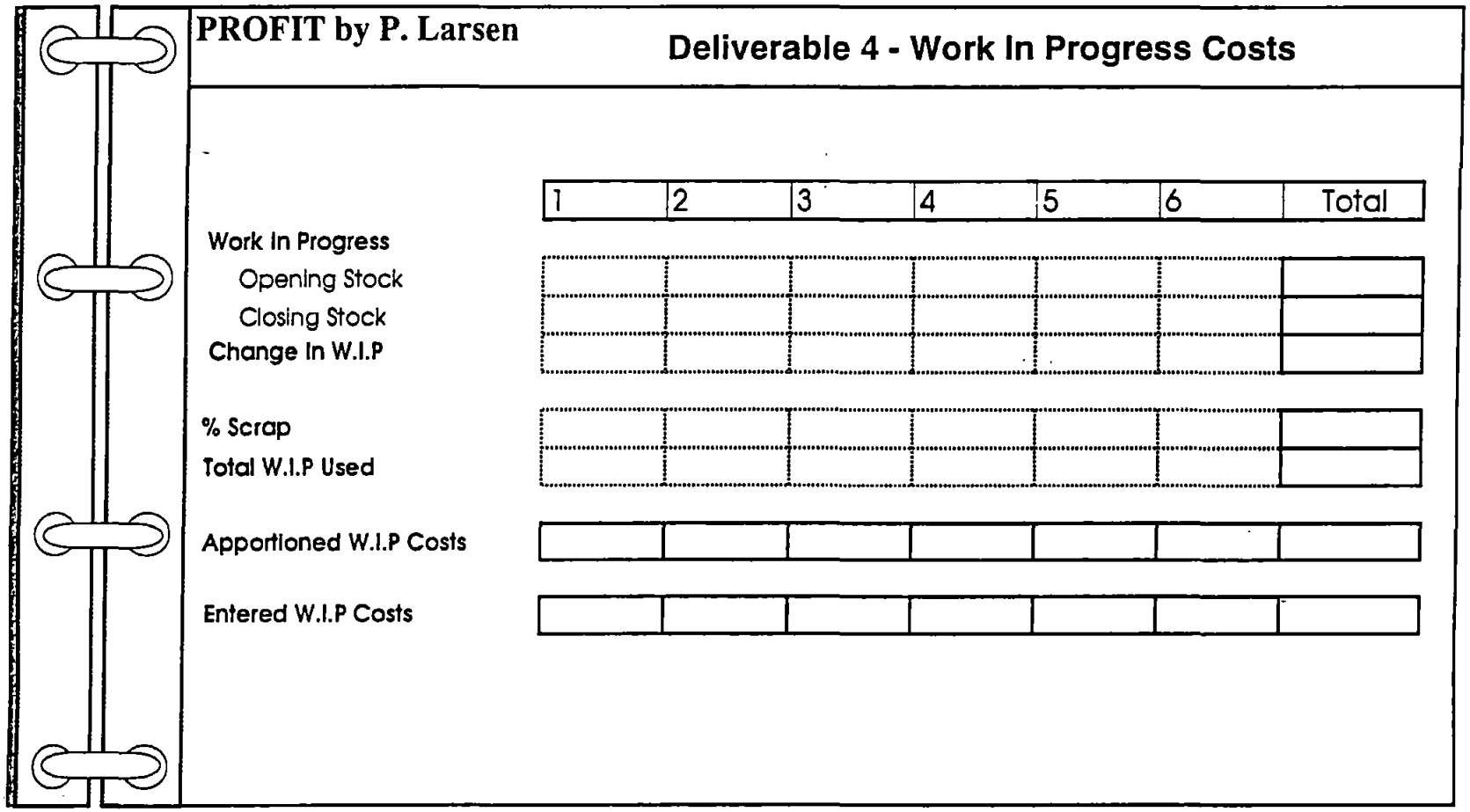
	1	2	3	4	5	6	Total
Raw Materials							
Opening Stock							
Purchases							
Closing Stock							
Cost of Raw Materials Stock							
Volume of Goods Produced							
Volume Produced							
Raw Material Cost of Goods Produced							
Cost per unit							
Percentage Scrap per							
Total Cost of Raw Mats.							

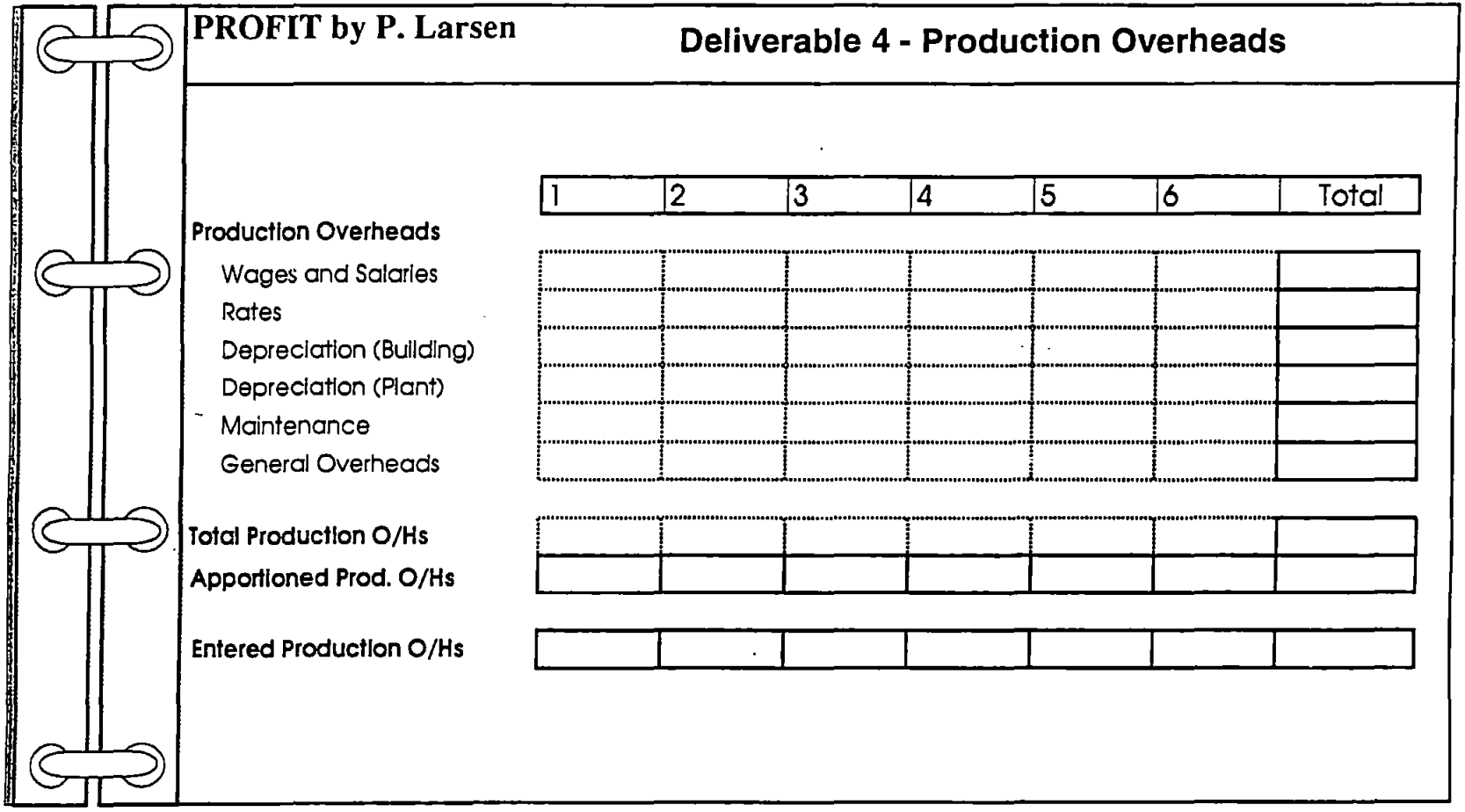


PROFIT by P. Larsen

Deliverable 4 - Bought Out Parts Costs

	1	2	3	4	5	6	Total
Bought Out Parts							
Opening Stock							
Purchases							
Closing Stock							
Cost of B.O.P. Stock							
Volume of Goods Produced							
Volume Produced							
Total Cost of Bought Out Parts							
Cost per unit							
Percentage Scrap per unit							
Total Cost of Bought Out Parts							

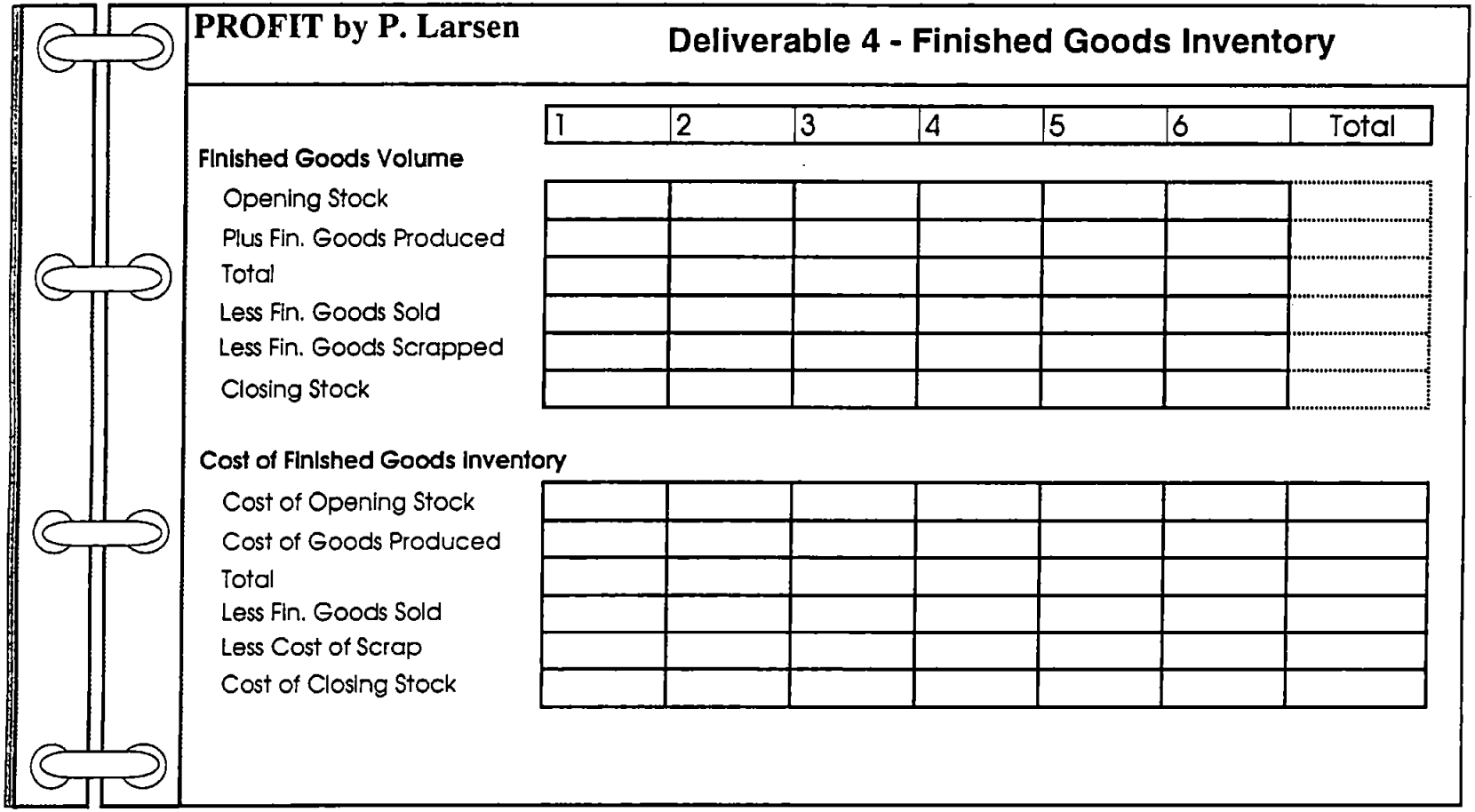

PROFIT by P. Larsen
Deliverable 4 - Work In Progress Costs
1
2
3
4
5
6
Total
Work In Progress
Opening Stock
Closing Stock
Change In W.I.P
% Scrap
Total W.I.P Used
Apportioned W.I.P Costs
Entered W.I.P Costs



PROFIT by P. Larsen

Deliverable 4 - Production Overheads

	1	2	3	4	5	6	Total
Production Overheads							
Wages and Salaries							
Rates							
Depreciation (Building)							
Depreciation (Plant)							
Maintenance							
General Overheads							
Total Production O/Hs							
Apportioned Prod. O/Hs							
Entered Production O/Hs							

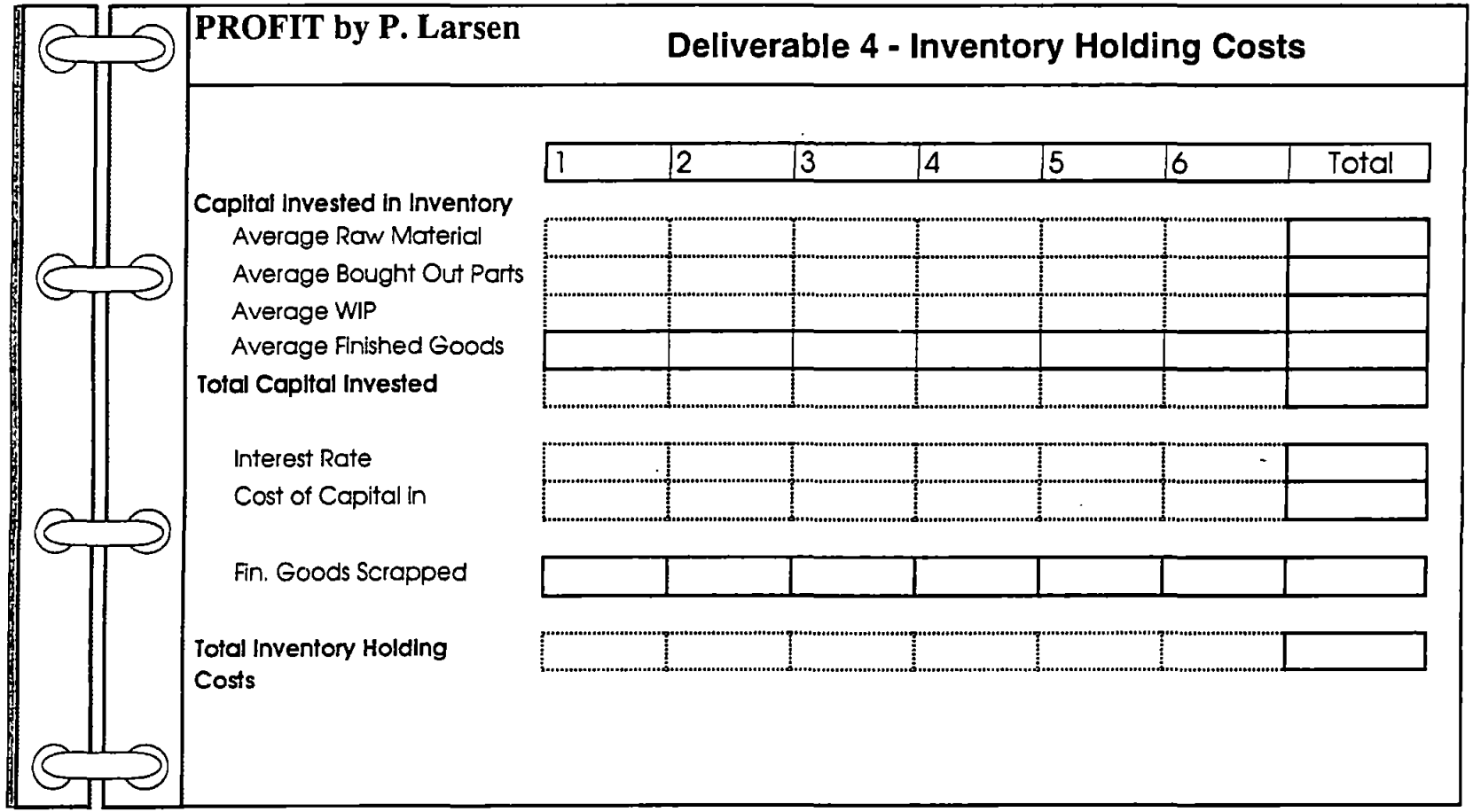


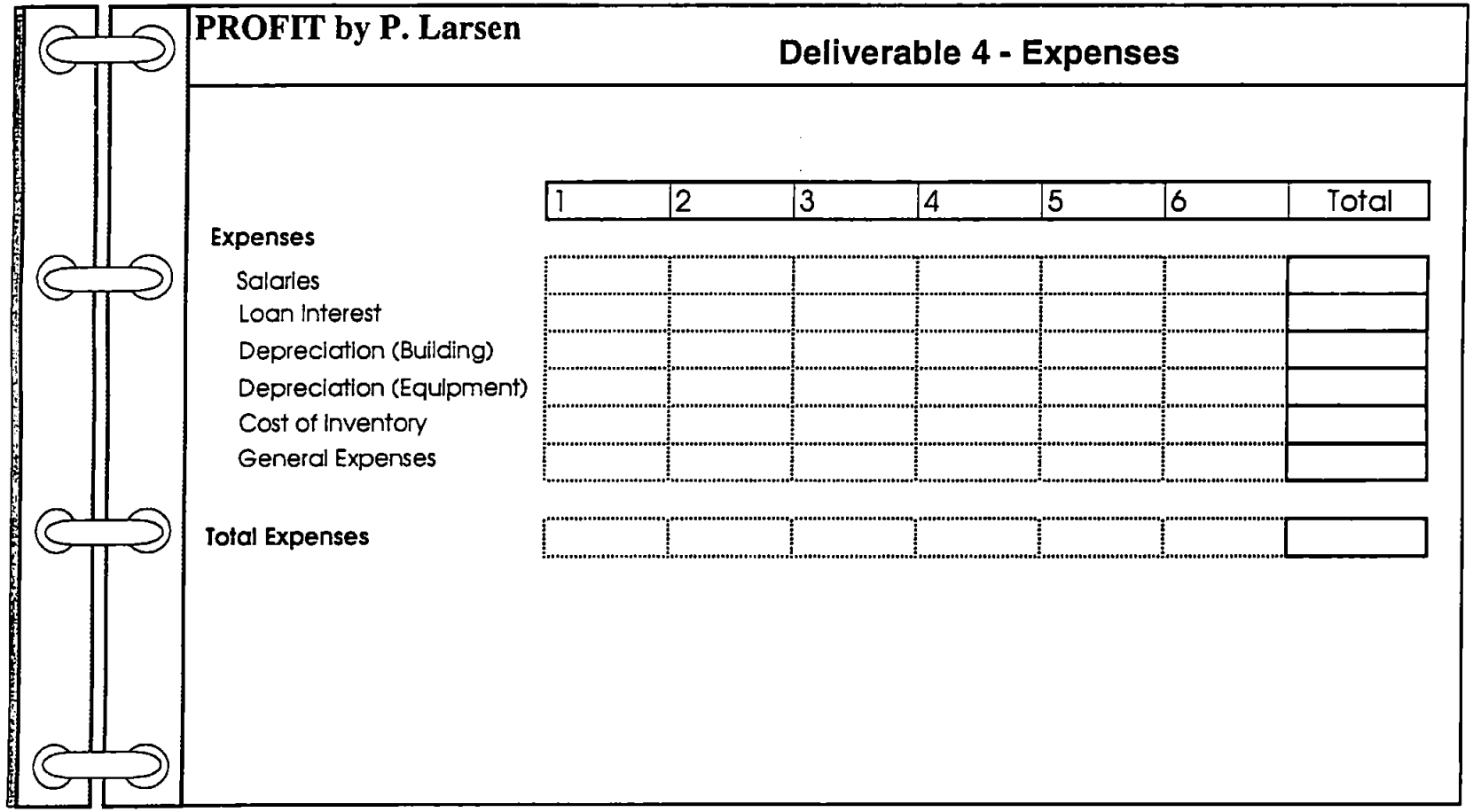
PROFIT by P. Larsen

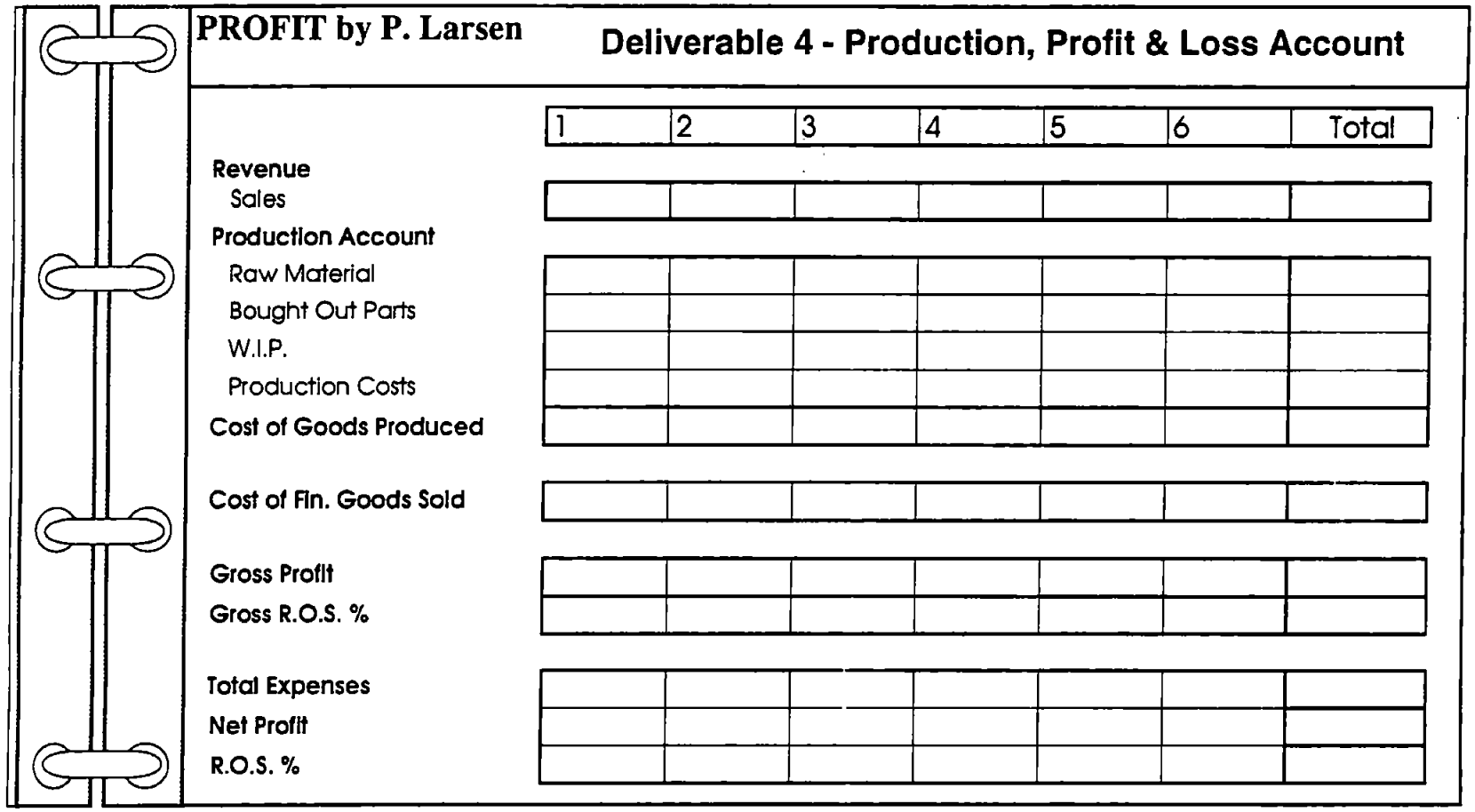
Deliverable 4 - Finished Goods Inventory

	1	2	3	4	5	6	Total
Finished Goods Volume							
Opening Stock							
Plus Fin. Goods Produced							
Total							
Less Fin. Goods Sold							
Less Fin. Goods Scrapped							
Closing Stock							

Cost of Finished Goods Inventory							
Cost of Opening Stock							
Cost of Goods Produced							
Total							
Less Fin. Goods Sold							
Less Cost of Scrap							
Cost of Closing Stock							


PROFIT by P. Larsen
Deliverable 4 - Inventory Holding Costs
1
2
3
4
5
6
Total
Capital Invested in Inventory
Average Raw Material
Average Bought Out Parts
Average WIP
Average Finished Goods
Total Capital Invested
Interest Rate
Cost of Capital In
Fin. Goods Scrapped
Total Inventory Holding Costs


PROFIT by P. Larsen
Deliverable 4 - Expenses
1
2
3
4
5
6
Total
Expenses
Salaries
Loan Interest
Depreciation (Building)
Depreciation (Equipment)
Cost of Inventory
General Expenses
Total Expenses



PROFIT by P. Larsen

Deliverable 4 - Production, Profit & Loss Account

	1	2	3	4	5	6	Total
Revenue							
Sales							
Production Account							
Raw Material							
Bought Out Parts							
W.I.P.							
Production Costs							
Cost of Goods Produced							
Cost of Fin. Goods Sold							
Gross Profit							
Gross R.O.S. %							
Total Expenses							
Net Profit							
R.O.S. %							

PROFIT by P. Larsen

Pro-forma 5a EXPECTED - Sales & Marketing

	1	2	3	4	5	6	Total
1 year on:							
Sales Volume							
Average Unit Price							
2 years on:							
Sales Volume							
Average Unit Price							
3 years on:							
Sales Volume							
Average Unit Price							
4 years on:							
Sales Volume							
Average Unit Price							
5 years on:							
Sales Volume							
Average Unit Price							

Help Screen

Please complete the above for the Sales Products selected for further analysis. Looking at the above Sales Products, what would be your EXPECTED scenario for the behaviour in terms of Sales Volume and Unit Price changes, each year, for the next five years?

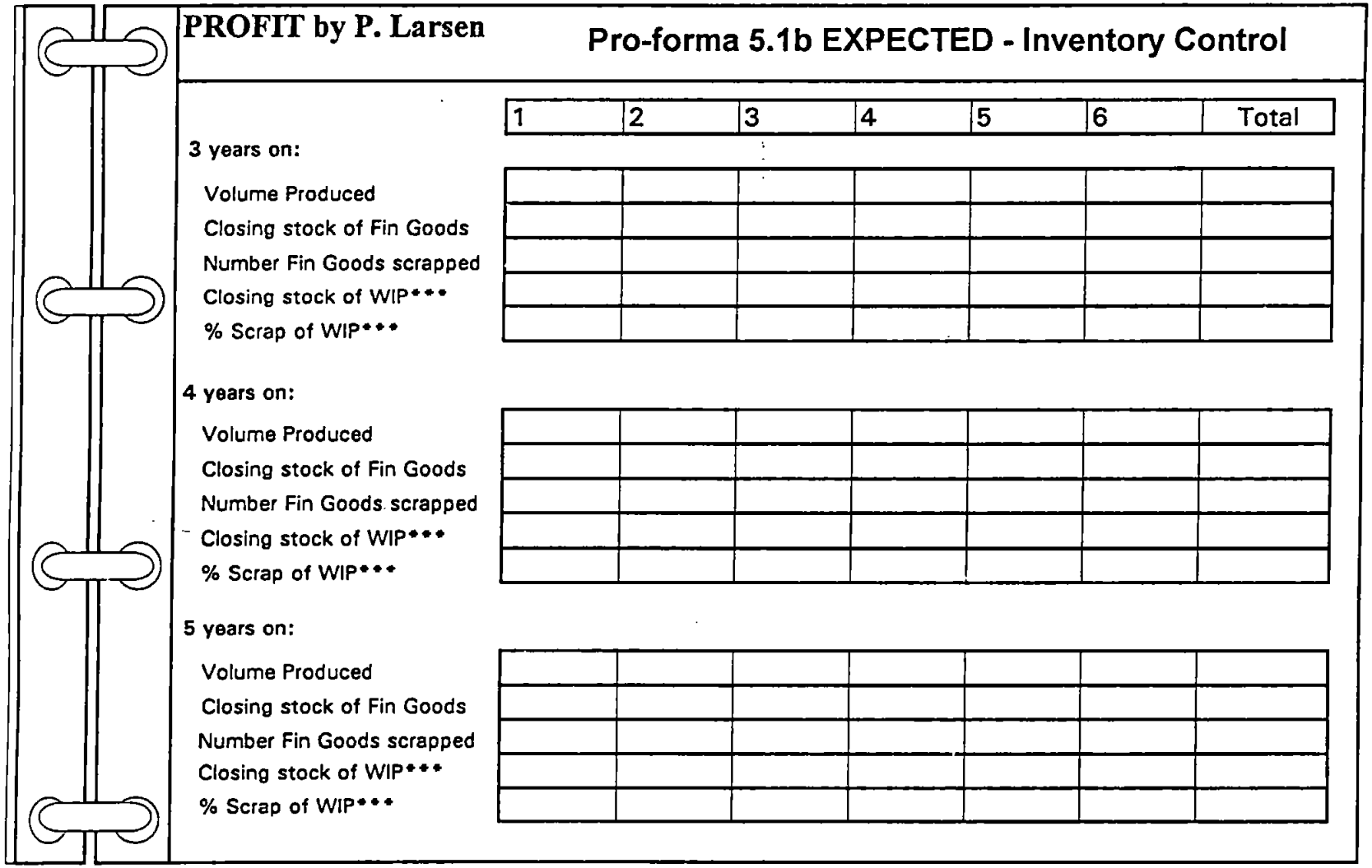
PROFIT by P. Larsen

Pro-forma 5b EXPECTED - Inventory Control

	1	2	3	4	5	6	Total
1 year on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods							
Closing stock of WIP***							
% Scrap of WIP***							
2 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods							
Closing stock of WIP***							
% Scrap of WIP***							

Help Screen

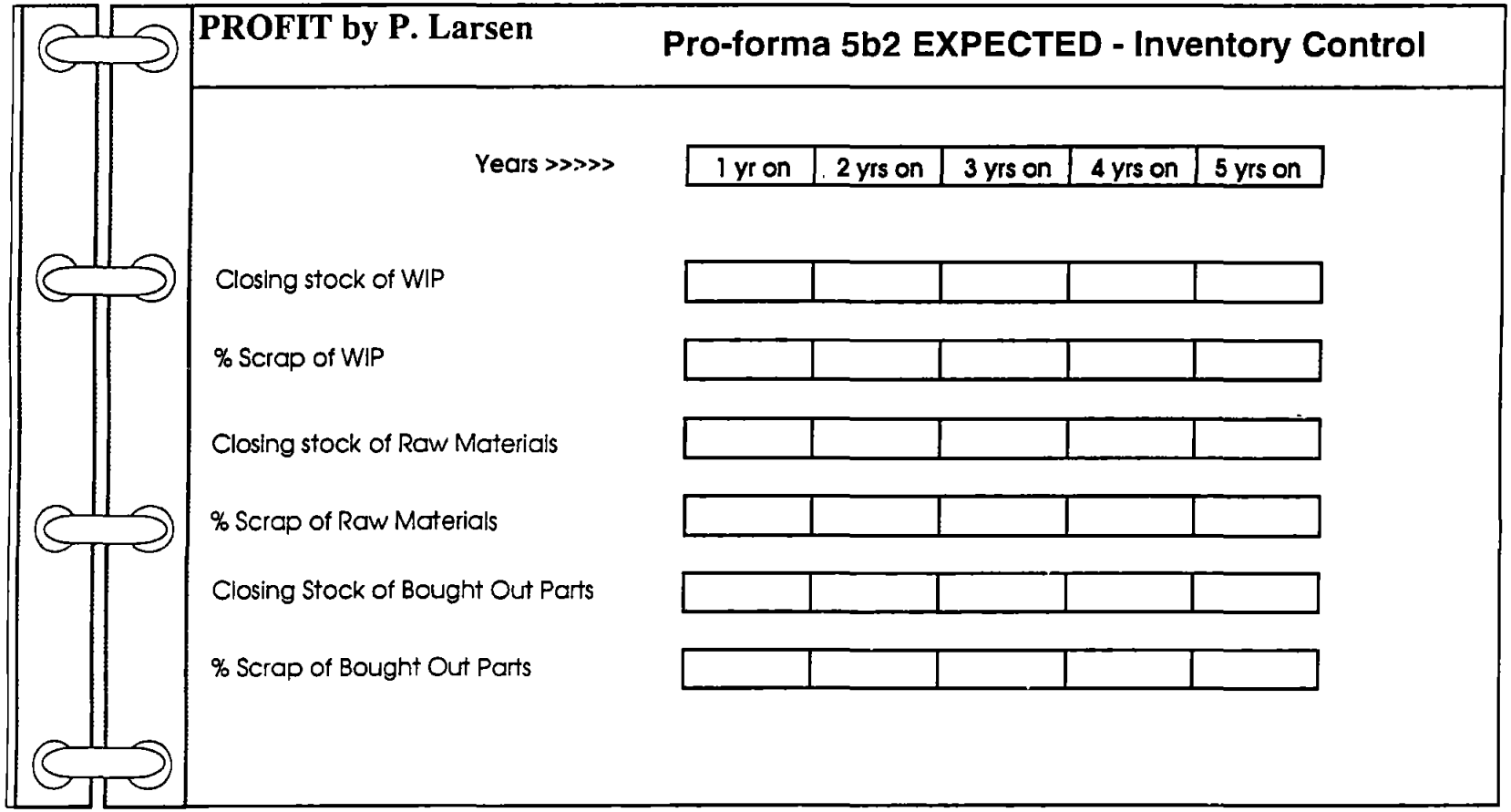
Please complete the above for the Sales Products selected for further analysis. Looking at the above Sales Products, what would be your EXPECTED scenario for the behaviour in terms of changes to the factors shown, each year, for the next two years? Please complete Pro-forma 5.1b for years three to five.



PROFIT by P. Larsen

Pro-forma 5.1b EXPECTED - Inventory Control

	1	2	3	4	5	6	Total
3 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
4 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
5 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							



PROFIT by P. Larsen

Pro-forma 5b2 EXPECTED - Inventory Control

Years >>>>>	1 yr on	2 yrs on	3 yrs on	4 yrs on	5 yrs on
Closing stock of WIP					
% Scrap of WIP					
Closing stock of Raw Materials					
% Scrap of Raw Materials					
Closing Stock of Bought Out Parts					
% Scrap of Bought Out Parts					

Help Screen

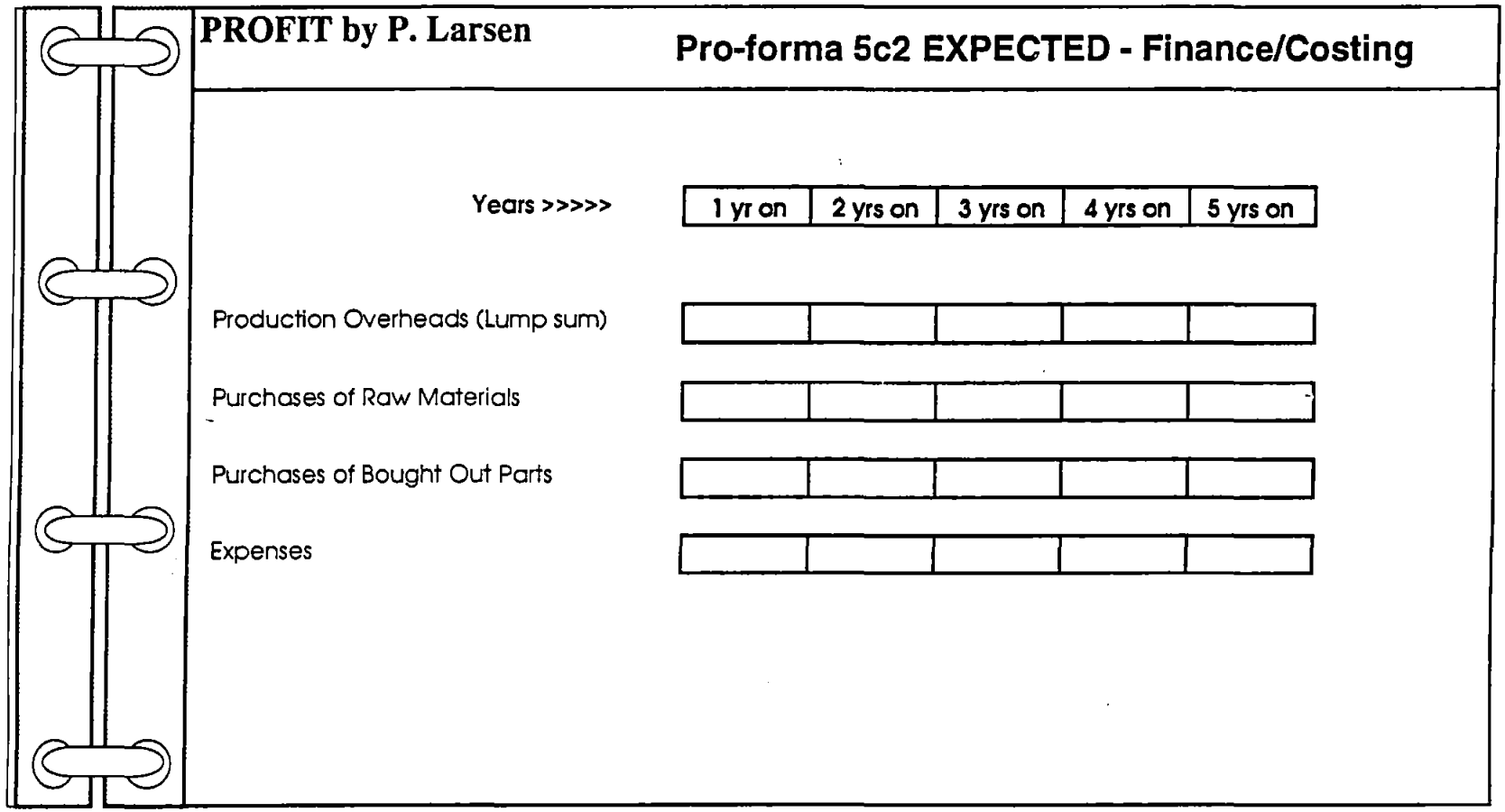
Please complete the above on a Company Wide basis. Looking at the above, what would be your EXPECTED scenario for the behaviour in terms of changes to the factors shown, each year, for the next five years?

PROFIT by P. Larsen

Pro-forma 5c EXPECTED - Finance/Costing

	1	2	3	4	5	6	Total
1 year on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
2 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
3 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
4 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
5 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							

Help Screen - What would be your EXPECTED scenario for changes to the factors shown for each year?



PROFIT by P. Larsen

Pro-forma 5c2 EXPECTED - Finance/Costing

Years >>>>>	1 yr on	2 yrs on	3 yrs on	4 yrs on	5 yrs on
Production Overheads (Lump sum)					
Purchases of Raw Materials					
Purchases of Bought Out Parts					
Expenses					

Help Screen

Please complete the above on a Company Wide basis. Looking at the above, what would be your EXPECTED scenario for the behaviour in terms of changes to the factors shown, each year, for the next five years?

PROFIT by P. Larsen

Pro-forma 5a OPTIMISTIC- Sales & Marketing

	1	2	3	4	5	6	Total
1 year on:							
Sales Volume							
Average Unit Price							
2 years on:							
Sales Volume							
Average Unit Price							
3 years on:							
Sales Volume							
Average Unit Price							
4 years on:							
Sales Volume							
Average Unit Price							
5 years on:							
Sales Volume							
Average Unit Price							

Help Screen

Please complete the above for the Sales Products selected for further analysis. Looking at the above Sales Products, what would be your OPTIMISTIC scenario for the behaviour in terms of Sales Volume and Unit Price changes, each year, for the next five years?

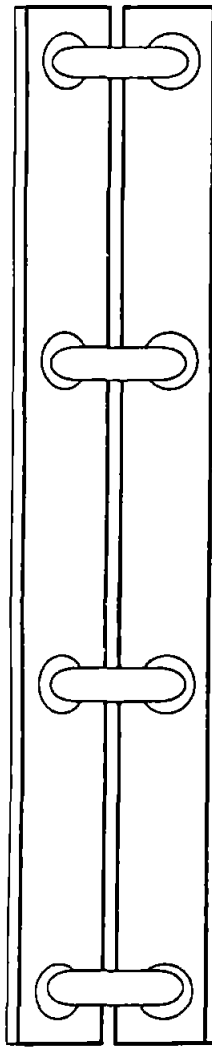
PROFIT by P. Larsen

Pro-forma 5b OPTIMISTIC - Inventory Control

	1	2	3	4	5	6	Total
1 year on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
2 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							

Help Screen

Please complete the above for the Sales Products selected for further analysis. Looking at the above Sales Products, what would be your OPTIMISTIC scenario for the behaviour in terms of changes to the factors shown, each year, for the next two years? Please complete Pro-forma 5b2 for years three to five.



PROFIT by P. Larsen

Pro-forma 5.1b OPTIMISTIC - Inventory Control

	1	2	3	4	5	6	Total
3 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
4 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
5 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							

PROFIT by P. Larsen

Pro-forma 5b2 OPTIMISTIC - Inventory Control

Years >>>>>	1 yr on	2 yrs on	3 yrs on	4 yrs on	5 yrs on
Closing stock of WIP					
% Scrap of WIP					
Closing stock of Raw Materials					
% Scrap of Raw Materials					
Closing Stock of Bought Out Parts					
% Scrap of Bought Out Parts					

Help Screen

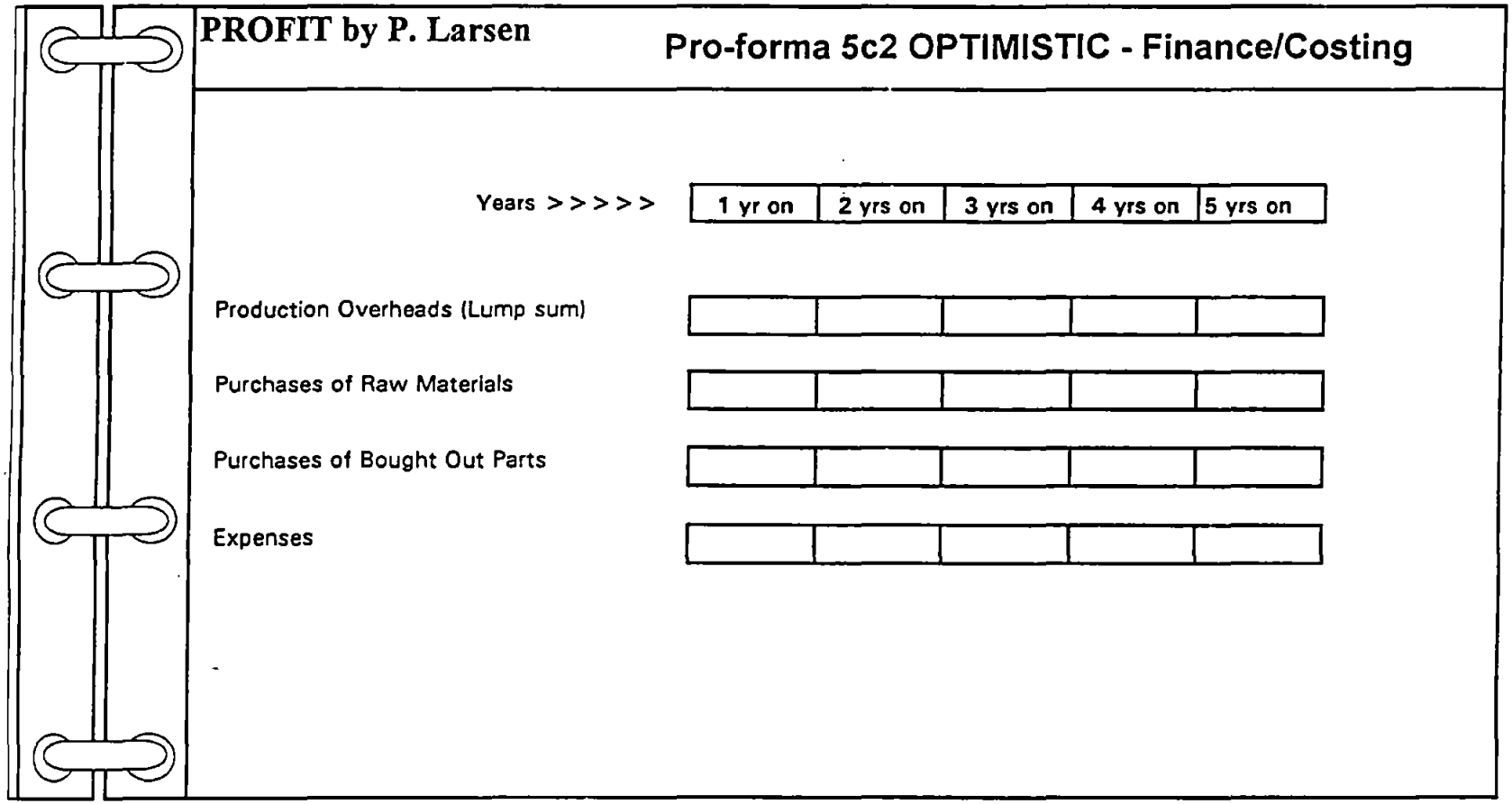
Please complete the above on a Company Wide basis. Looking at the above, what would be your OPTIMISTIC scenario for the behaviour in terms of changes to the factors shown, each year, for the next five years?

PROFIT by P. Larsen

Pro-forma 5c OPTIMISTIC - Finance/Costing

	1	2	3	4	5	6	Total
1 year on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
2 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
3 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
4 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
5 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							

Help Screen - What would be yourOPTIMISTIC scenario for changes to the factors shown for each year?



PROFIT by P. Larsen

Pro-forma 5c2 OPTIMISTIC - Finance/Costing

Years >>>>>	1 yr on	2 yrs on	3 yrs on	4 yrs on	5 yrs on
Production Overheads (Lump sum)					
Purchases of Raw Materials					
Purchases of Bought Out Parts					
Expenses					

Help Screen

Please complete the above on a Company Wide basis. Looking at the above, what would be your OPTIMISTIC scenario for the behaviour in terms of changes to the factors shown, each year, for the next five years?

PROFIT by P. Larsen

Pro-forma 5a PESSIMISTIC- Sales & Marketing

	1	2	3.	4	5	6	Total
1 year on:							
Sales Volume							
Average Unit Price							
2 years on:							
Sales Volume							
Average Unit Price							
3 years on:							
Sales Volume							
Average Unit Price							
4 years on:							
Sales Volume							
Average Unit Price							
5 years on:							
Sales Volume							
Average Unit Price							

Help Screen

Please complete the above for the Sales Products selected for further analysis. Looking at the above Sales Products, what would be your PESSIMISTIC scenario for the behaviour in terms of Sales Volume and Unit Price changes, each year, for the next five years?

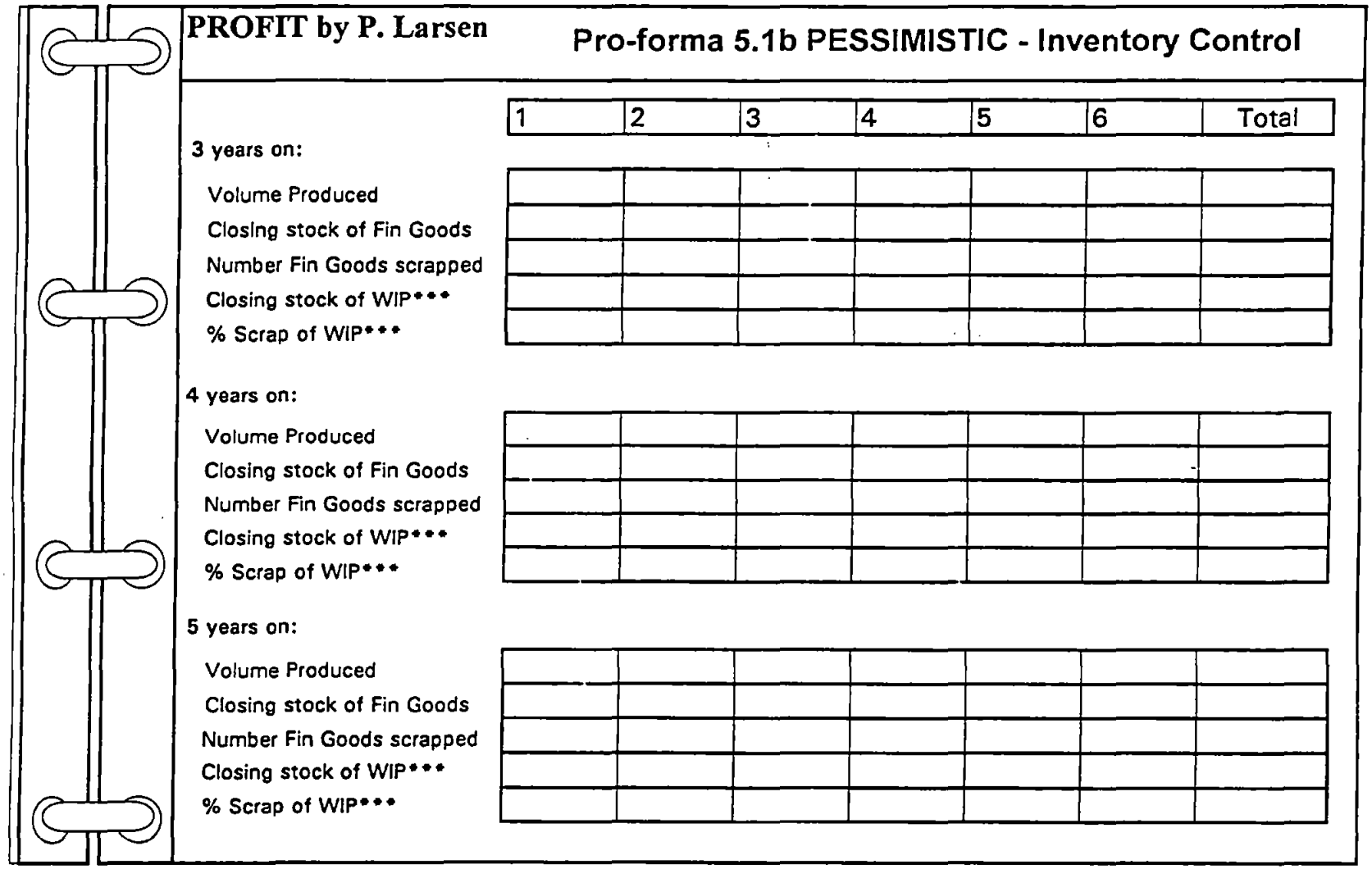
PROFIT by P. Larsen

Pro-forma 5b PESSIMISTIC - Inventory Control

	1	2	3	4	5	6	Total
1 year on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
2 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							

Help Screen

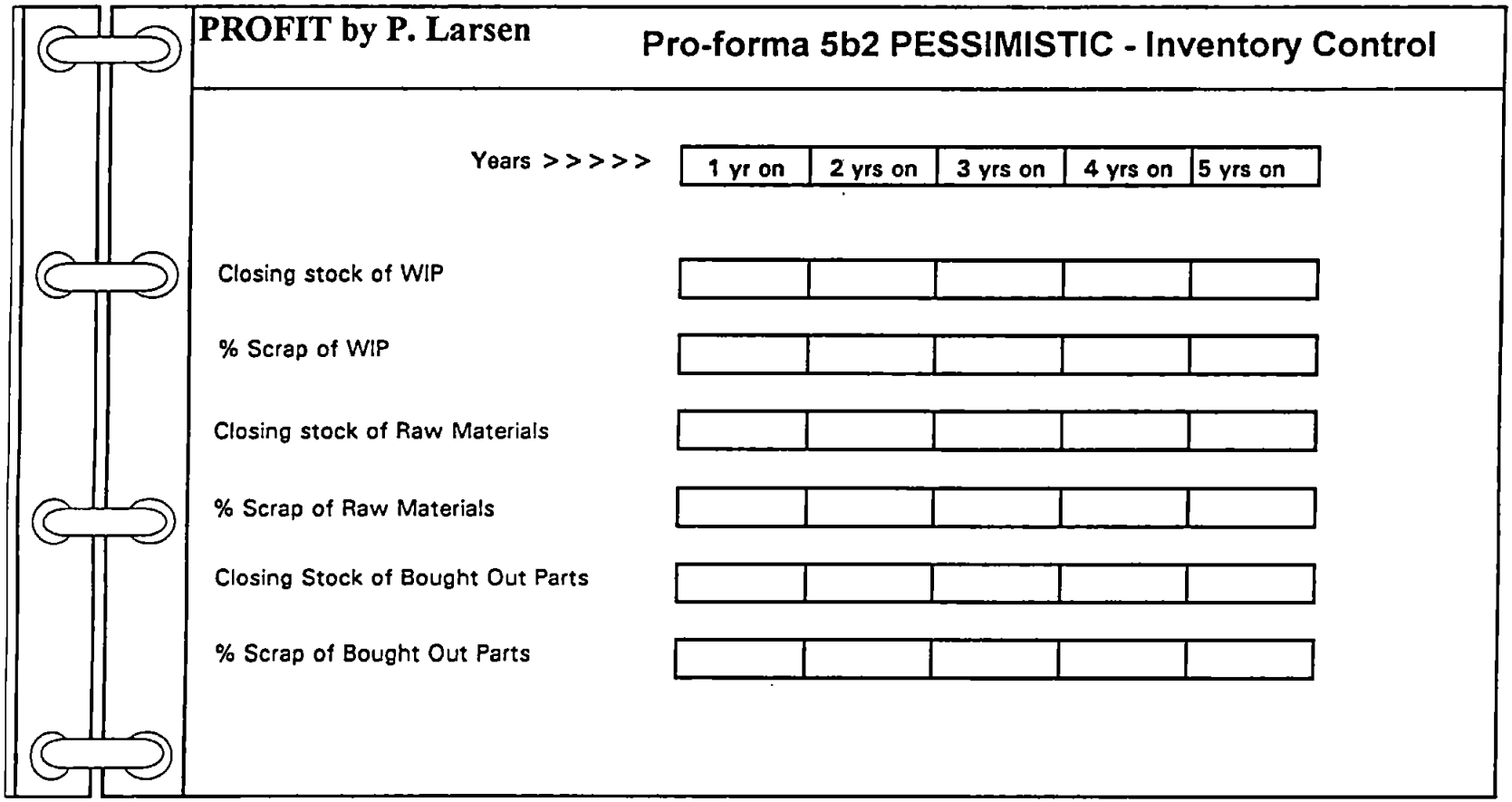
Complete the above for the Sales Products selected for further analysis. Looking at the above Sales Products, what would be your PESSIMISTIC scenario for the behaviour in terms of changes to the factors shown, each year, for the next two years? Complete Pro-forma 5b2 for years three to five.



PROFIT by P. Larsen

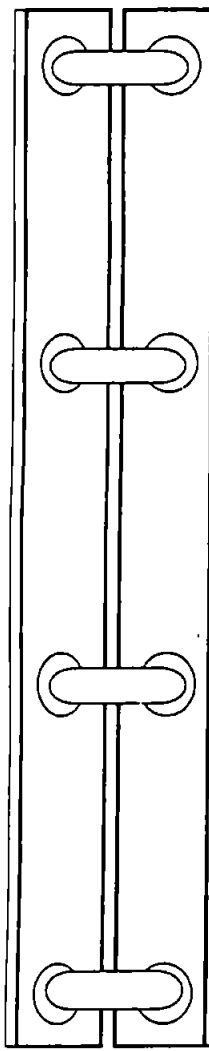
Pro-forma 5.1b PESSIMISTIC - Inventory Control

	1	2	3	4	5	6	Total
3 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
4 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							
5 years on:							
Volume Produced							
Closing stock of Fin Goods							
Number Fin Goods scrapped							
Closing stock of WIP***							
% Scrap of WIP***							



Help Screen

Please complete the above on a Company Wide basis. Looking at the above, what would be your PESSIMISTIC scenario for the behaviour in terms of changes to the factors shown, each year, for the next five years?

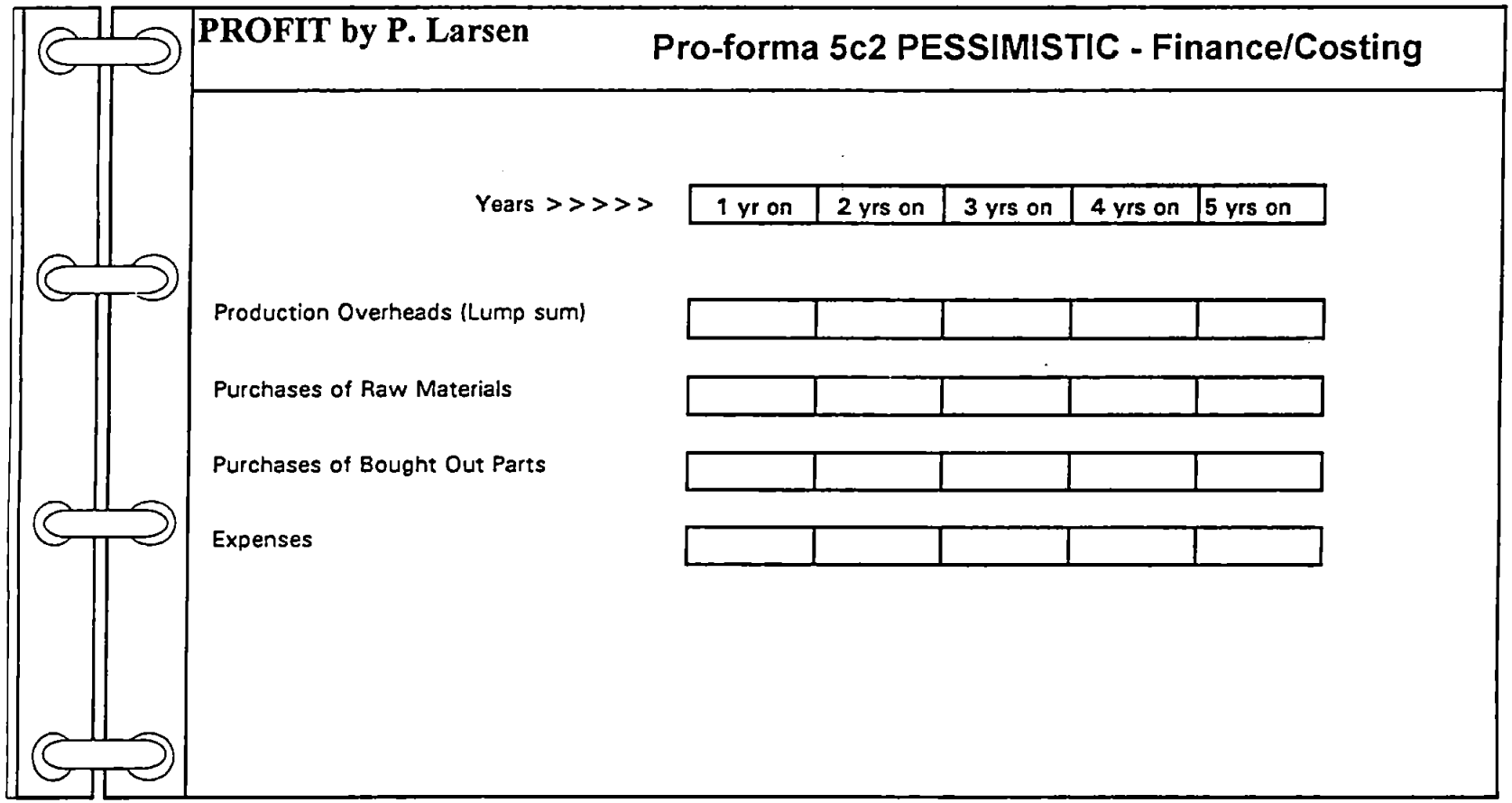


PROFIT by P. Larsen

Pro-forma 5c PESSIMISTIC - Finance/Costing

	1	2	3	4	5	6	Total
1 year on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
2 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
3 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
4 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							
5 years on:							
Unit Raw Material cost							
Unit Bought Out Part cost							
Production Overheads***							

Help Screen - What would be your PESSIMISTIC scenario for changes to the factors shown for each year?



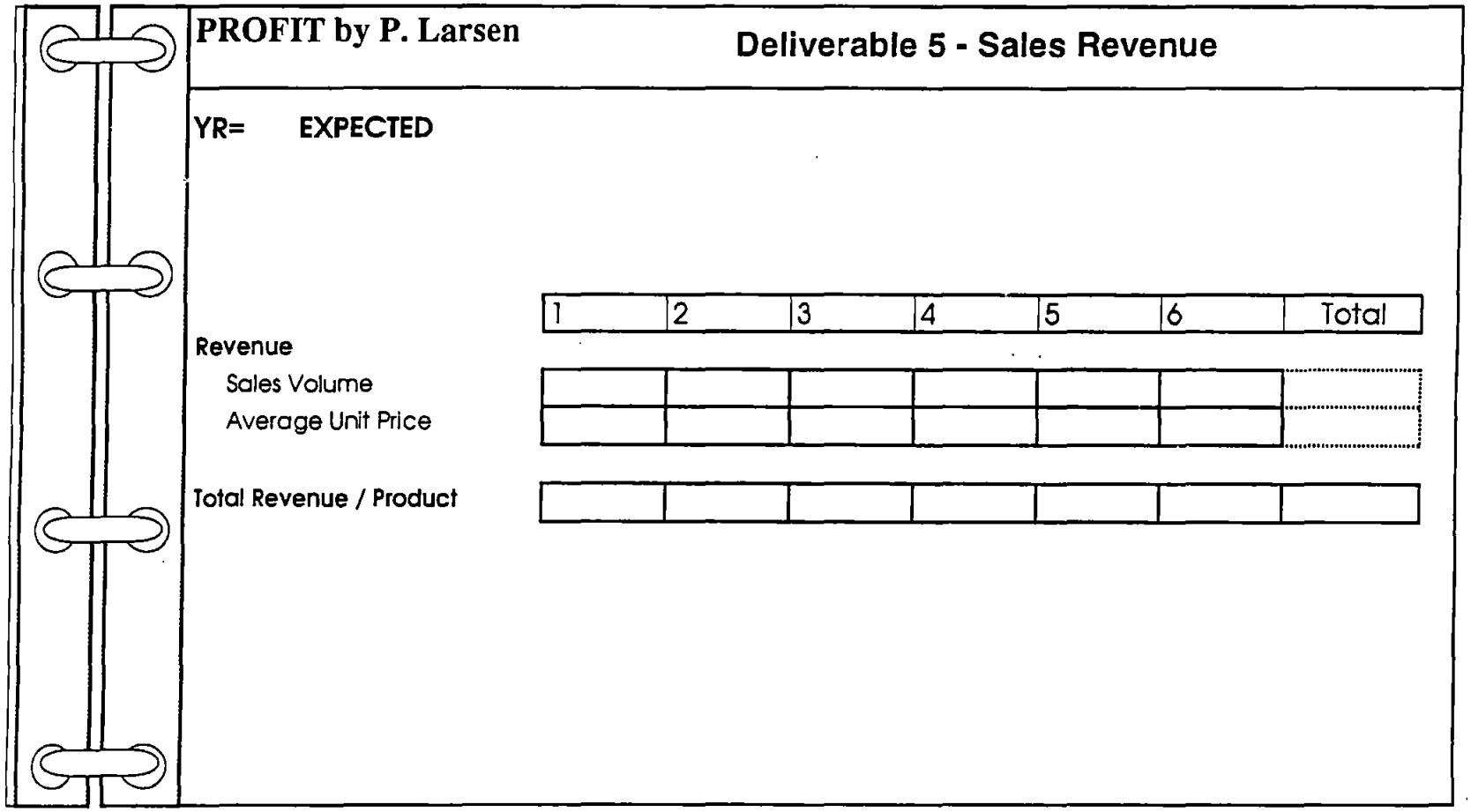
PROFIT by P. Larsen

Pro-forma 5c2 PESSIMISTIC - Finance/Costing

Years >>>>>	1 yr on	2 yrs on	3 yrs on	4 yrs on	5 yrs on
Production Overheads (Lump sum)					
Purchases of Raw Materials					
Purchases of Bought Out Parts					
Expenses					

Help Screen

Please complete the above on a Company Wide basis. Looking at the above, what would be your PESSIMISTIC scenario for the behaviour in terms of changes to the factors shown, each year, for the next five years?

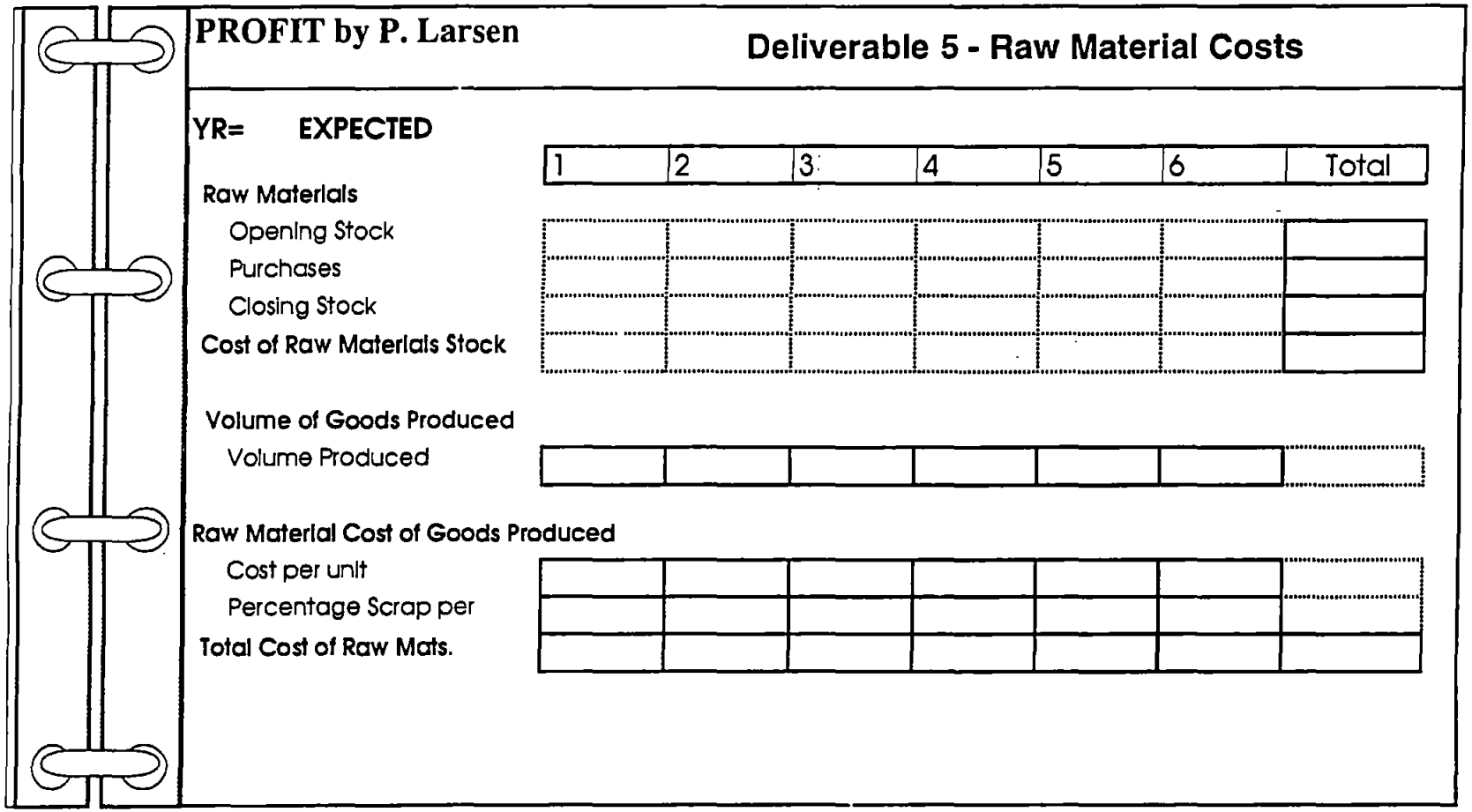


PROFIT by P. Larsen

Deliverable 5 - Sales Revenue

YR= **EXPECTED**

	1	2	3	4	5	6	Total
Revenue							
Sales Volume							
Average Unit Price							
Total Revenue / Product							

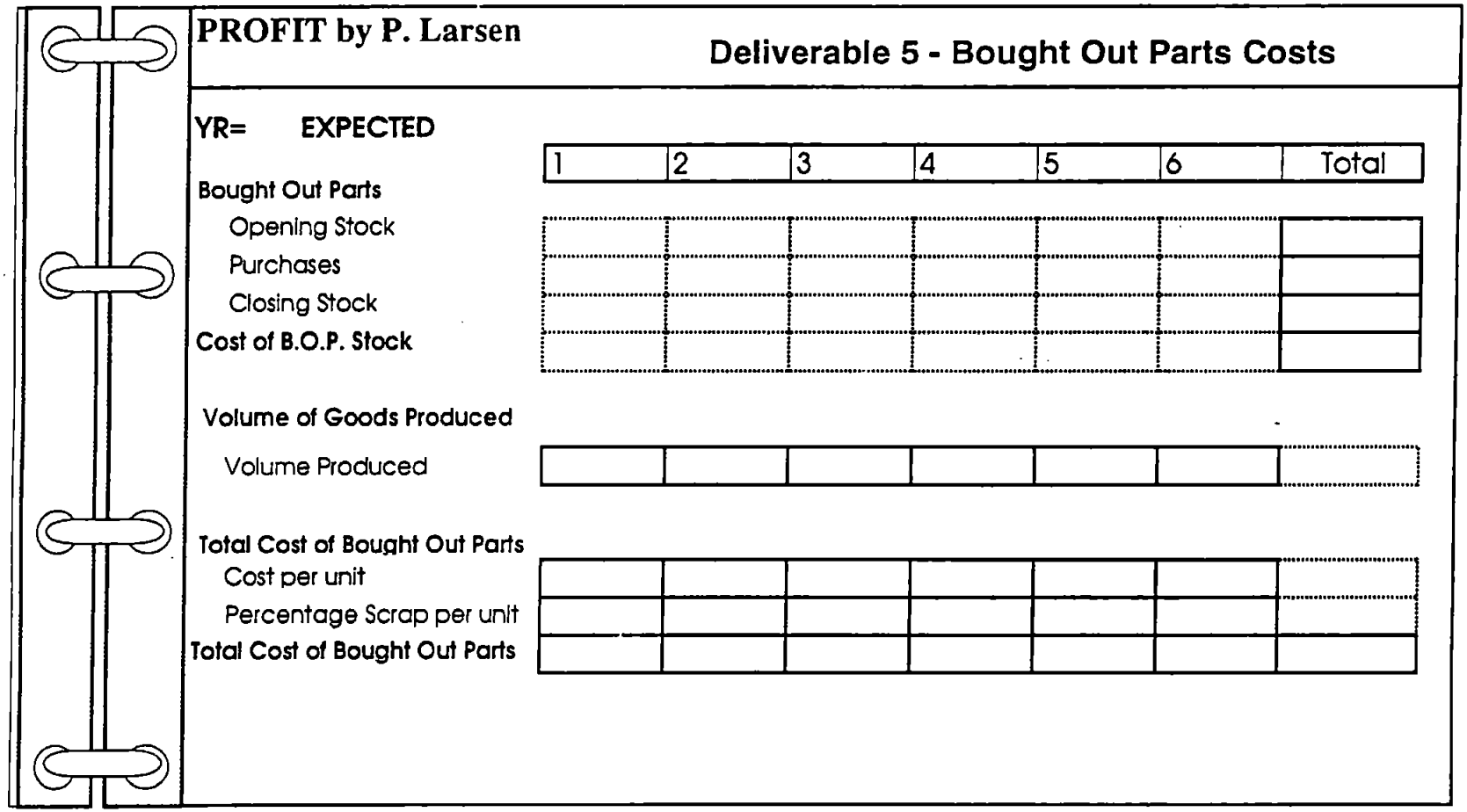


PROFIT by P. Larsen

Deliverable 5 - Raw Material Costs

YR= EXPECTED

	1	2	3	4	5	6	Total
Raw Materials							
Opening Stock							
Purchases							
Closing Stock							
Cost of Raw Materials Stock							
Volume of Goods Produced							
Volume Produced							
Raw Material Cost of Goods Produced							
Cost per unit							
Percentage Scrap per							
Total Cost of Raw Mats.							

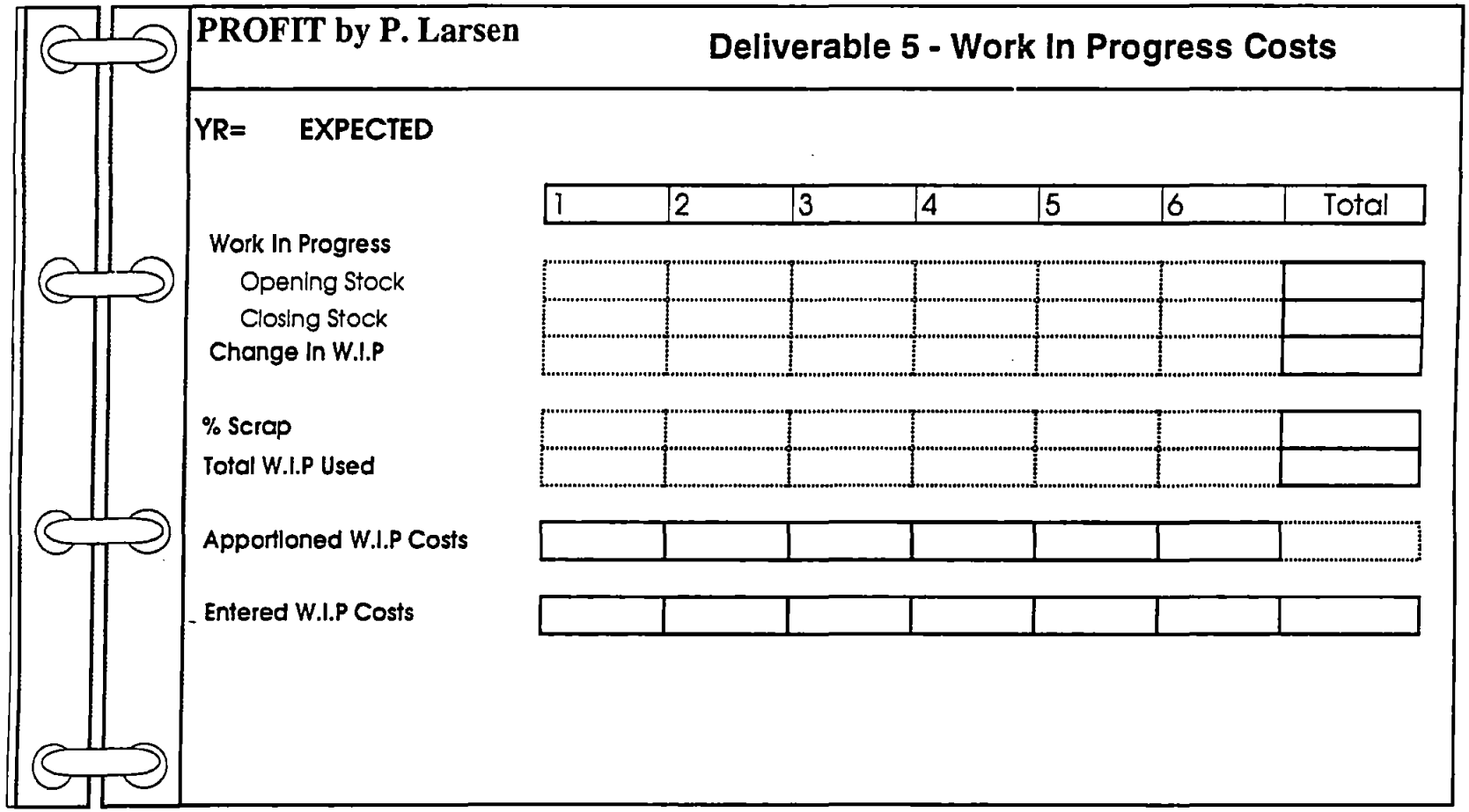


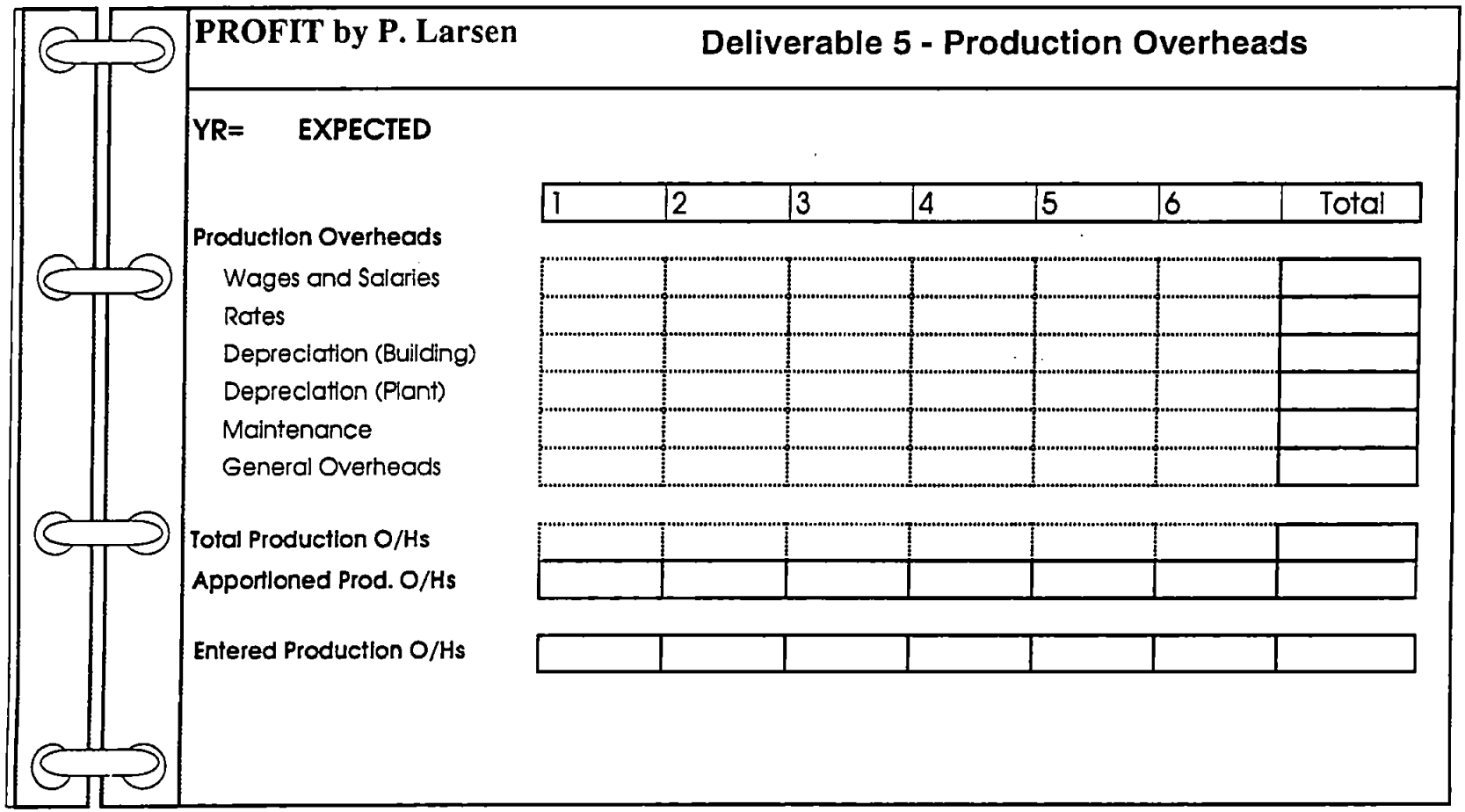
PROFIT by P. Larsen

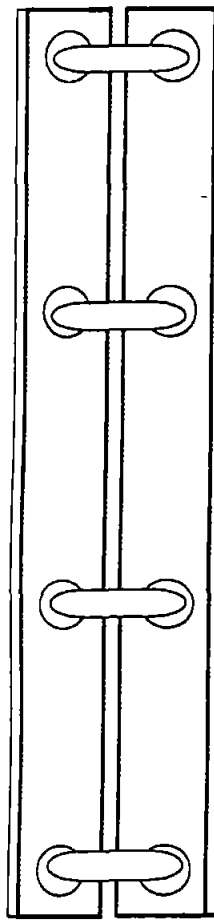
Deliverable 5 - Bought Out Parts Costs

YR= **EXPECTED**

	1	2	3	4	5	6	Total
Bought Out Parts							
Opening Stock							
Purchases							
Closing Stock							
Cost of B.O.P. Stock							
Volume of Goods Produced							
Volume Produced							
Total Cost of Bought Out Parts							
Cost per unit							
Percentage Scrap per unit							
Total Cost of Bought Out Parts							


PROFIT by P. Larsen
Deliverable 5 - Work In Progress Costs
YR= EXPECTED
1
2
3
4
5
6
Total
Work In Progress
Opening Stock
Closing Stock
Change In W.I.P
% Scrap
Total W.I.P Used
Apportioned W.I.P Costs
Entered W.I.P Costs


PROFIT by P. Larsen
Deliverable 5 - Production Overheads
YR= EXPECTED
1
2
3
4
5
6
Total
Production Overheads
Wages and Salaries
Rates
Depreciation (Building)
Depreciation (Plant)
Maintenance
General Overheads
Total Production O/Hs
Apportioned Prod. O/Hs
Entered Production O/Hs

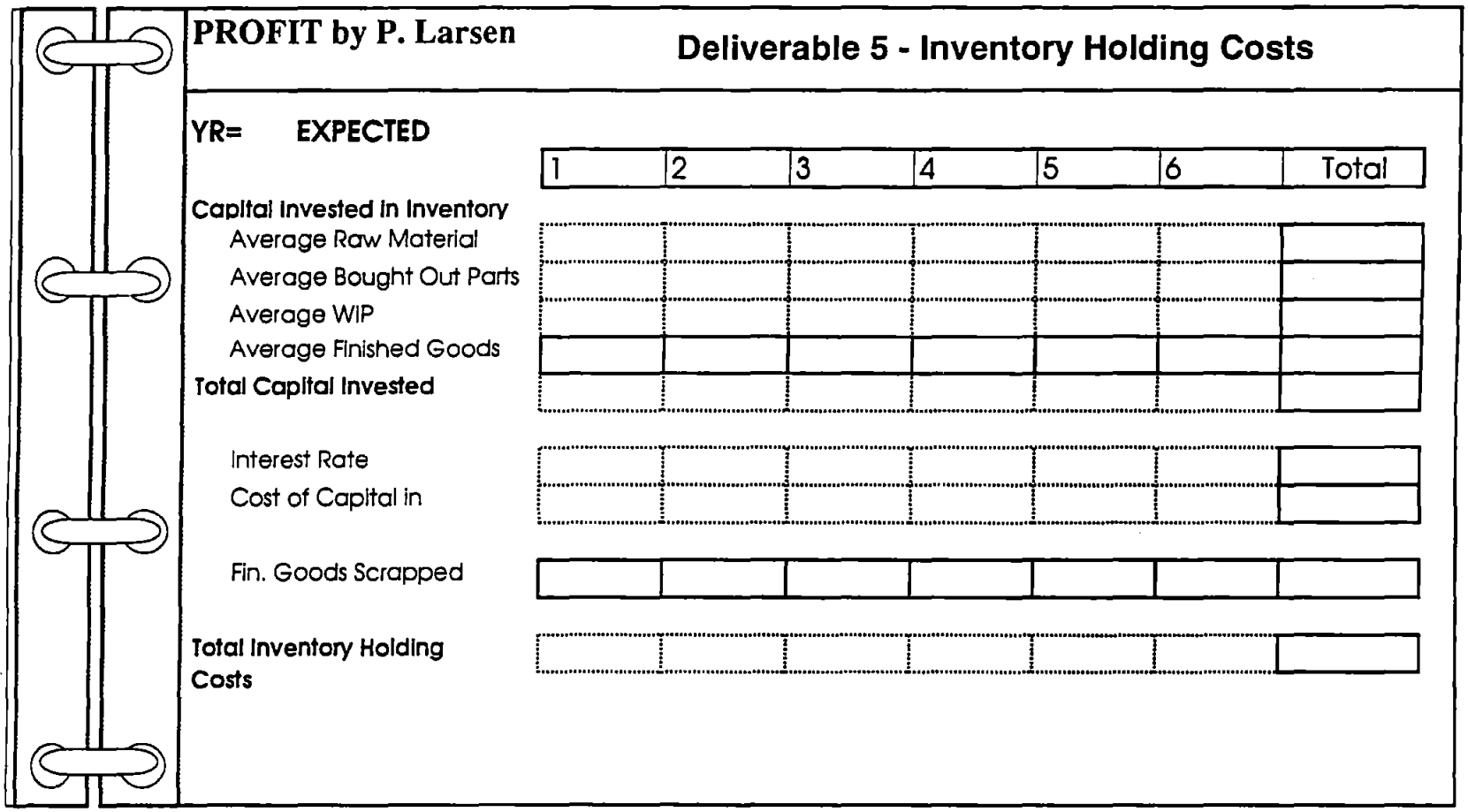


PROFIT by P. Larsen

Deliverable 5 - Finished Goods Inventory

YR= EXPECTED

	1	2	3	4	5	6	Total
Finished Goods Volume							
Opening Stock							
Plus Fin. Goods Produced							
Total							
Less Fin. Goods Sold							
Less Fin. Goods Scrapped							
Closing Stock							
Cost of Finished Goods Inventory							
Cost of Opening Stock							
Cost of Goods Produced							
Total							
Less Fin. Goods Sold							
Less Cost of Scrap							
Cost of Closing Stock							

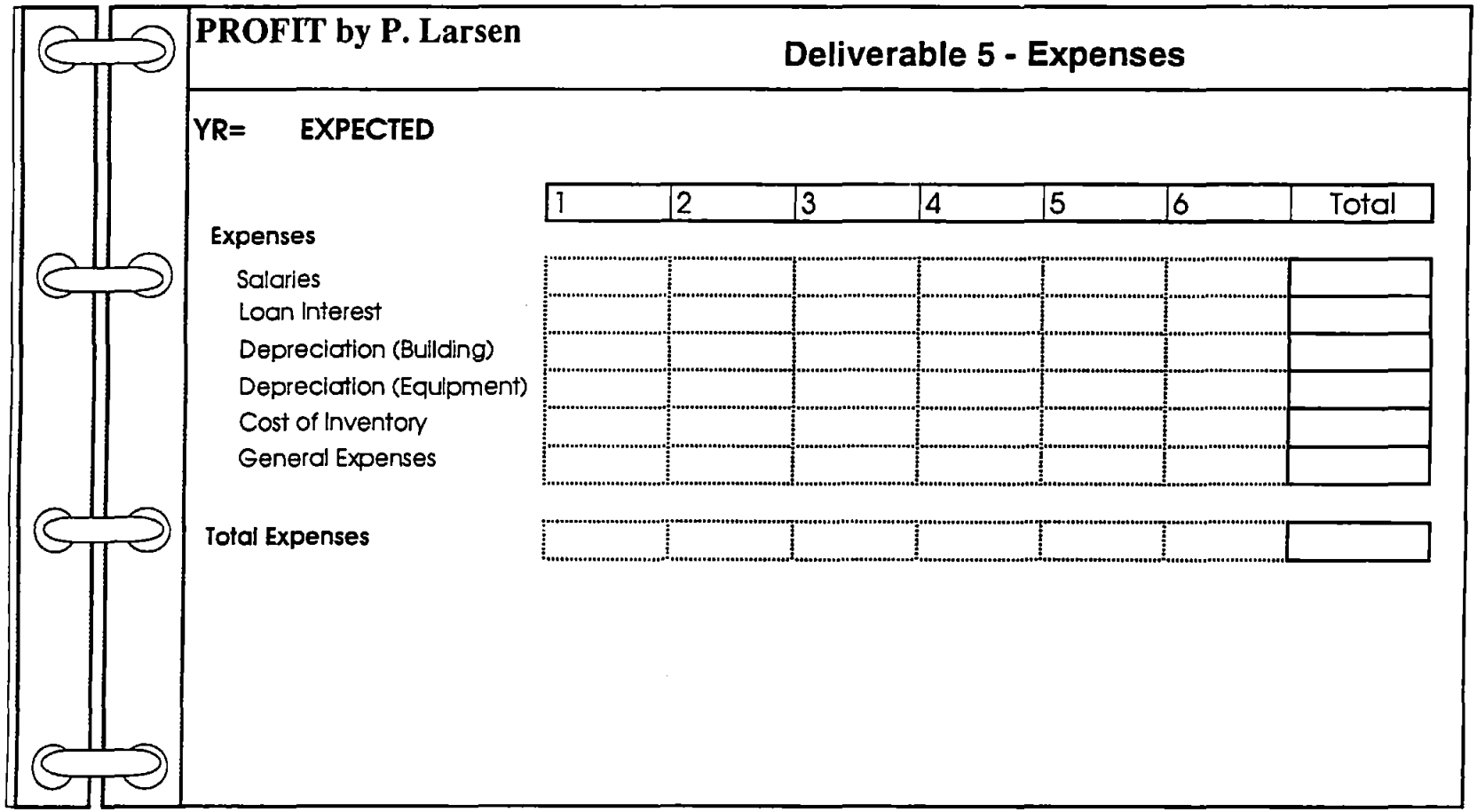


PROFIT by P. Larsen

Deliverable 5 - Inventory Holding Costs

YR= EXPECTED

	1	2	3	4	5	6	Total
Capital Invested in Inventory							
Average Raw Material							
Average Bought Out Parts							
Average WIP							
Average Finished Goods							
Total Capital Invested							
Interest Rate							
Cost of Capital in							
Fin. Goods Scrapped							
Total Inventory Holding Costs							

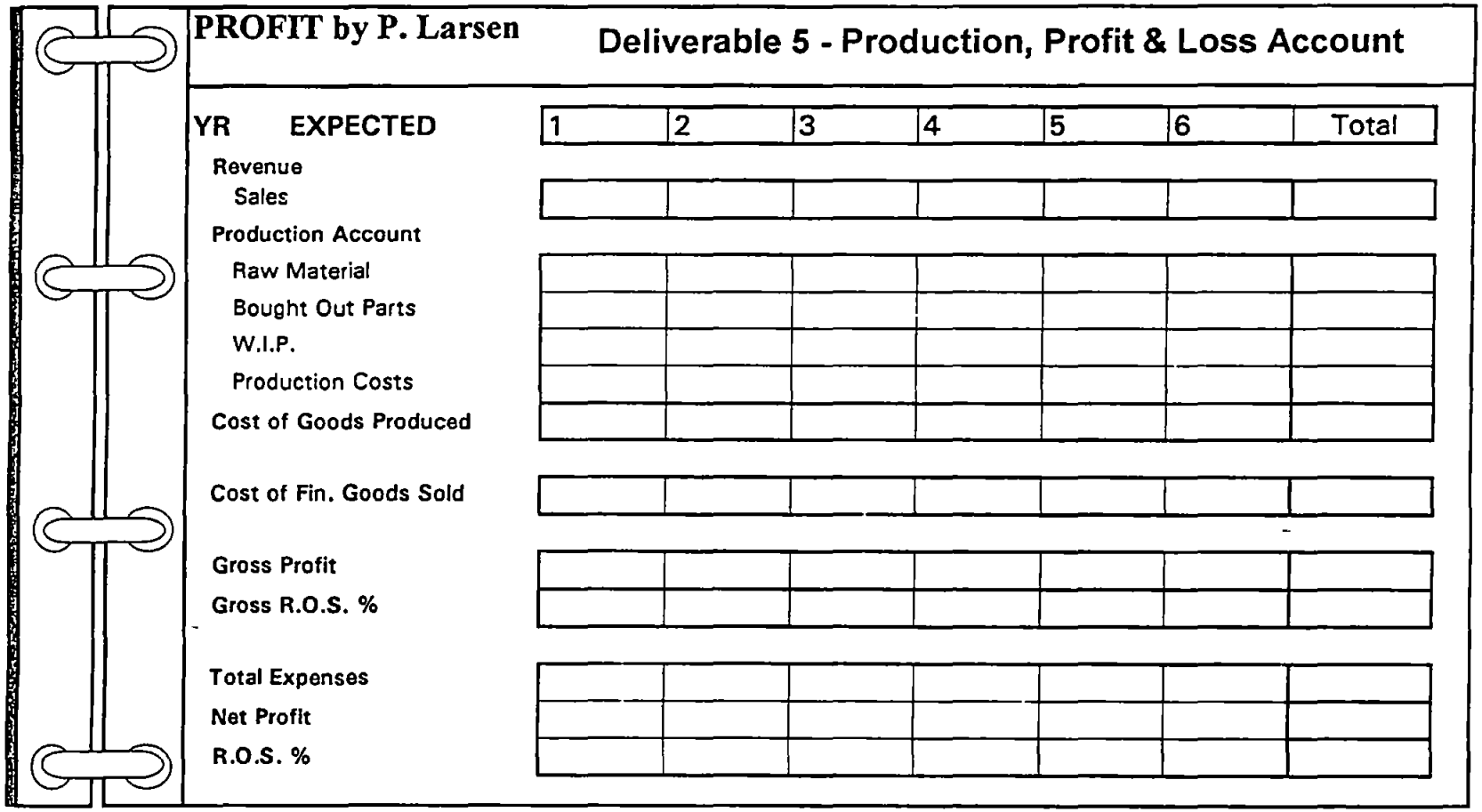


PROFIT by P. Larsen

Deliverable 5 - Expenses

YR= EXPECTED

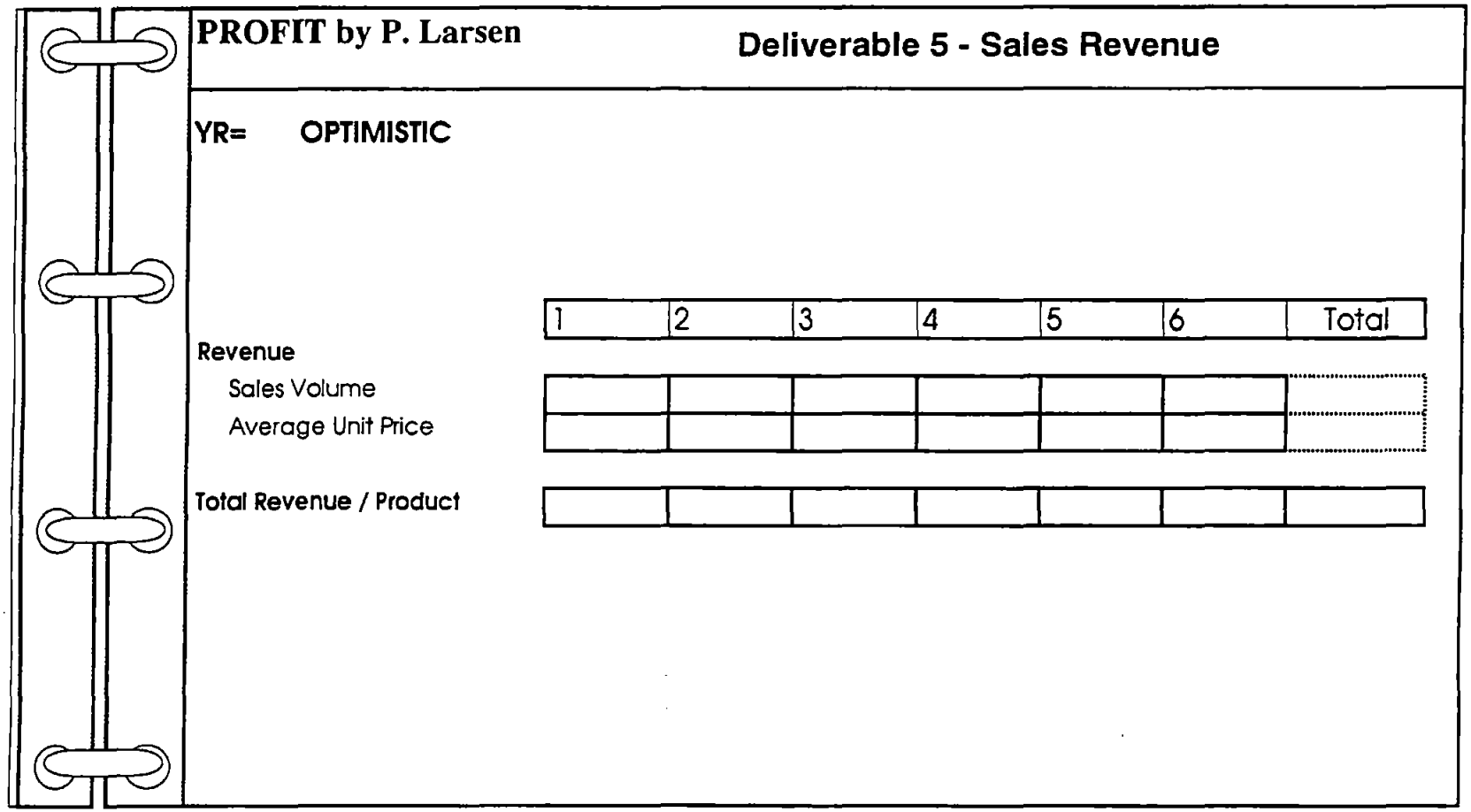
	1	2	3	4	5	6	Total
Expenses							
Salaries							
Loan Interest							
Depreciation (Building)							
Depreciation (Equipment)							
Cost of Inventory							
General Expenses							
Total Expenses							



PROFIT by P. Larsen

Deliverable 5 - Production, Profit & Loss Account

YR EXPECTED	1	2	3	4	5	6	Total
Revenue							
Sales							
Production Account							
Raw Material							
Bought Out Parts							
W.I.P.							
Production Costs							
Cost of Goods Produced							
Cost of Fin. Goods Sold							
Gross Profit							
Gross R.O.S. %							
Total Expenses							
Net Profit							
R.O.S. %							

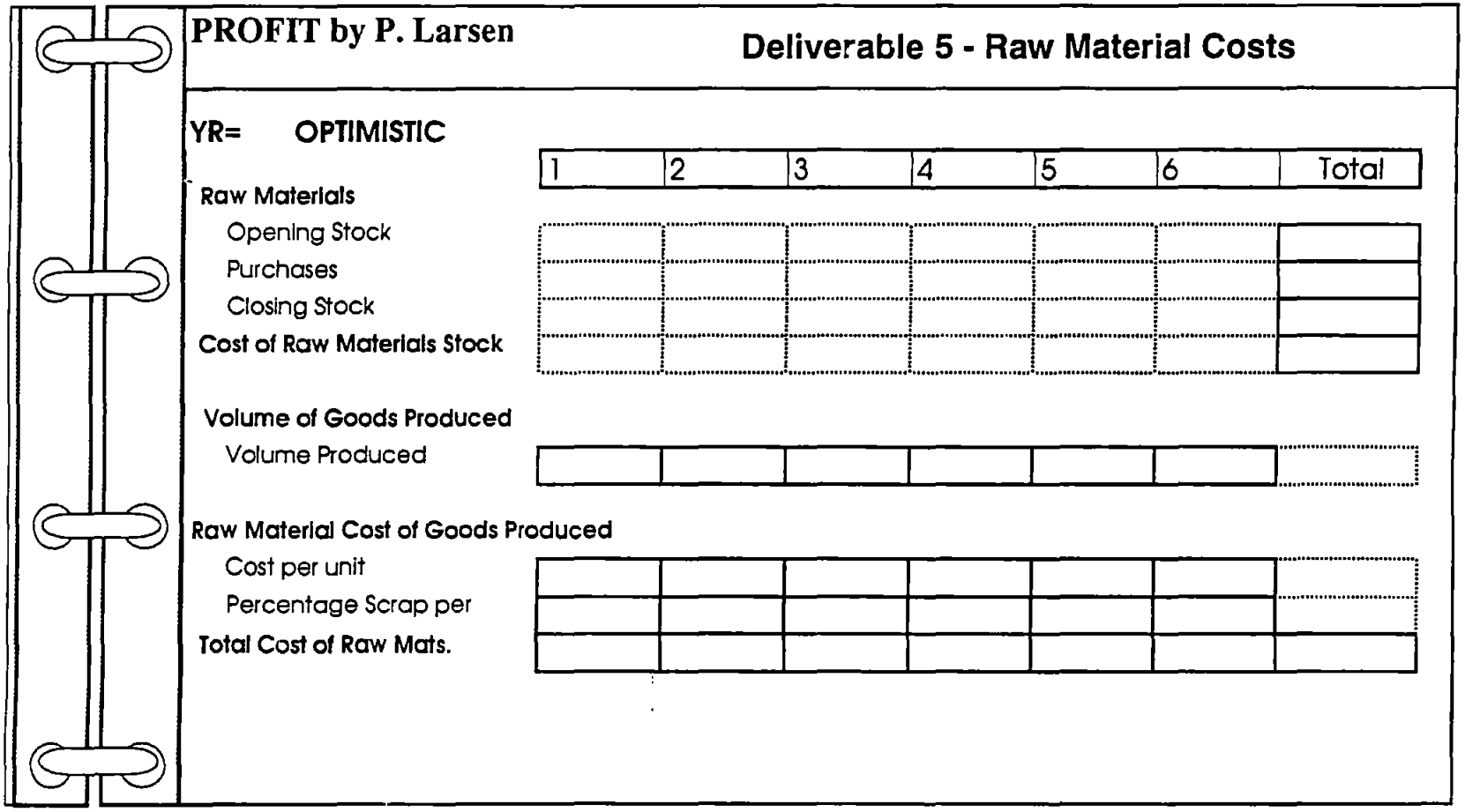


PROFIT by P. Larsen

Deliverable 5 - Sales Revenue

YR= **OPTIMISTIC**

	1	2	3	4	5	6	Total
Revenue							
Sales Volume							
Average Unit Price							
Total Revenue / Product							

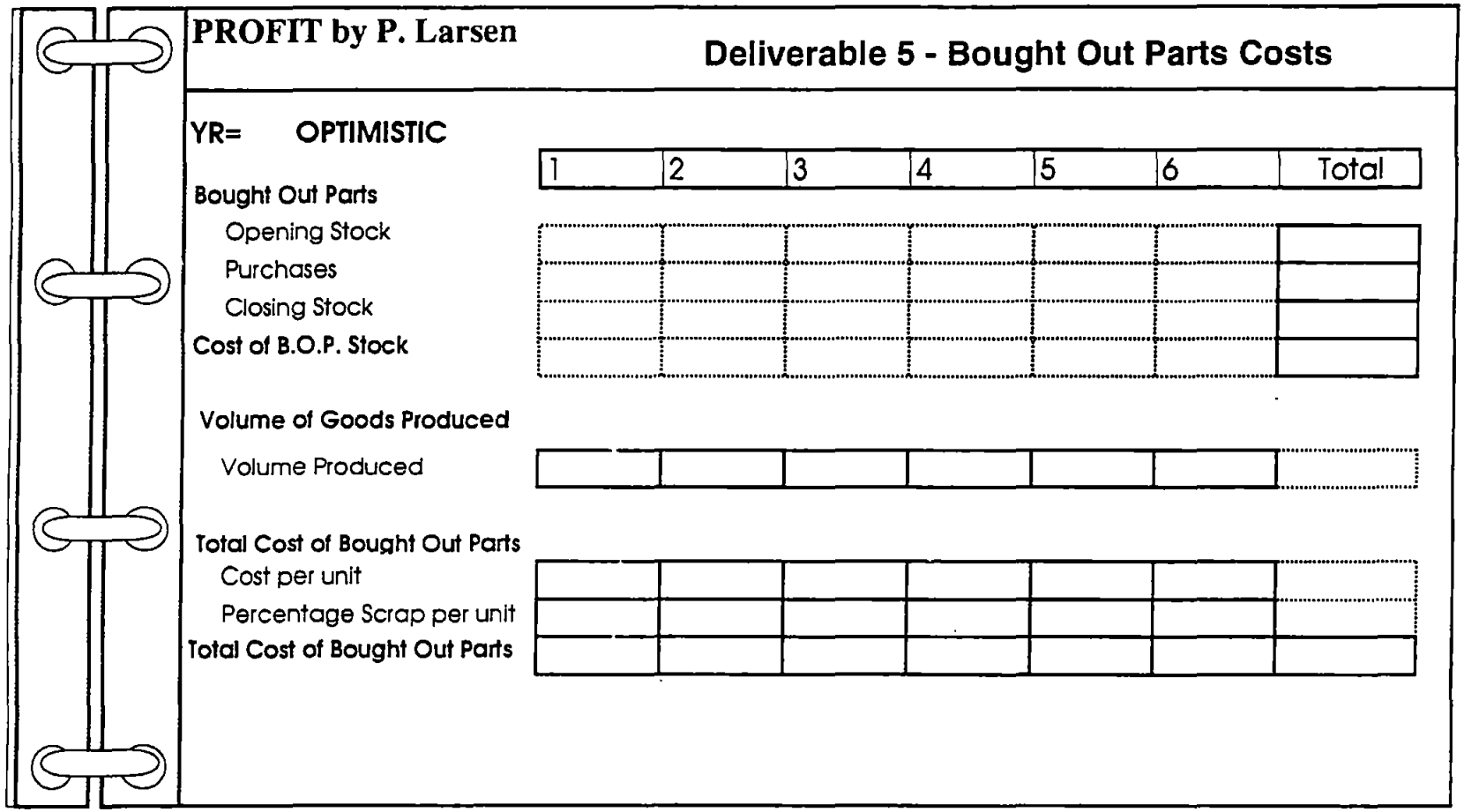


PROFIT by P. Larsen

Deliverable 5 - Raw Material Costs

YR= OPTIMISTIC

	1	2	3	4	5	6	Total
Raw Materials							
Opening Stock							
Purchases							
Closing Stock							
Cost of Raw Materials Stock							
Volume of Goods Produced							
Volume Produced							
Raw Material Cost of Goods Produced							
Cost per unit							
Percentage Scrap per							
Total Cost of Raw Mats.							

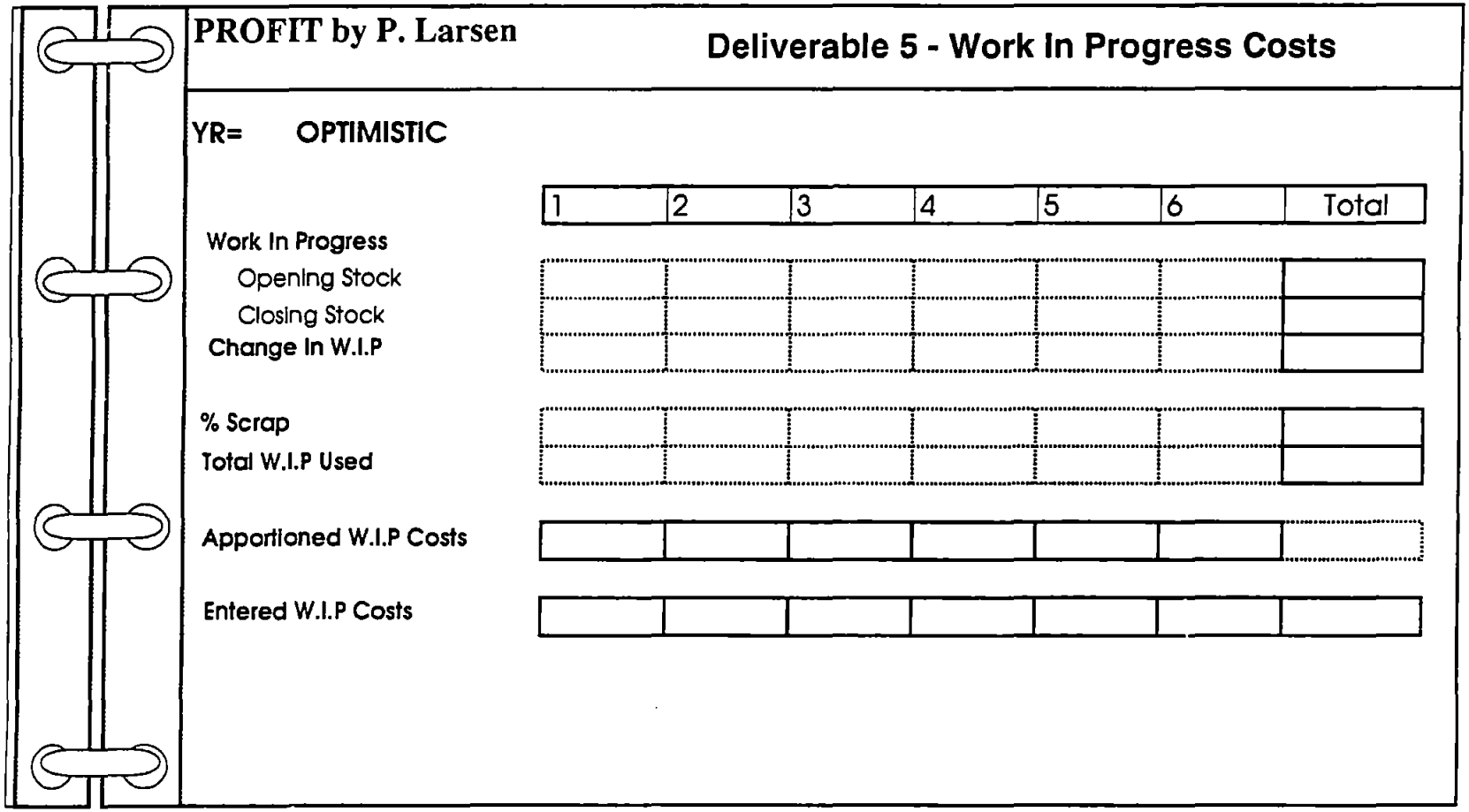


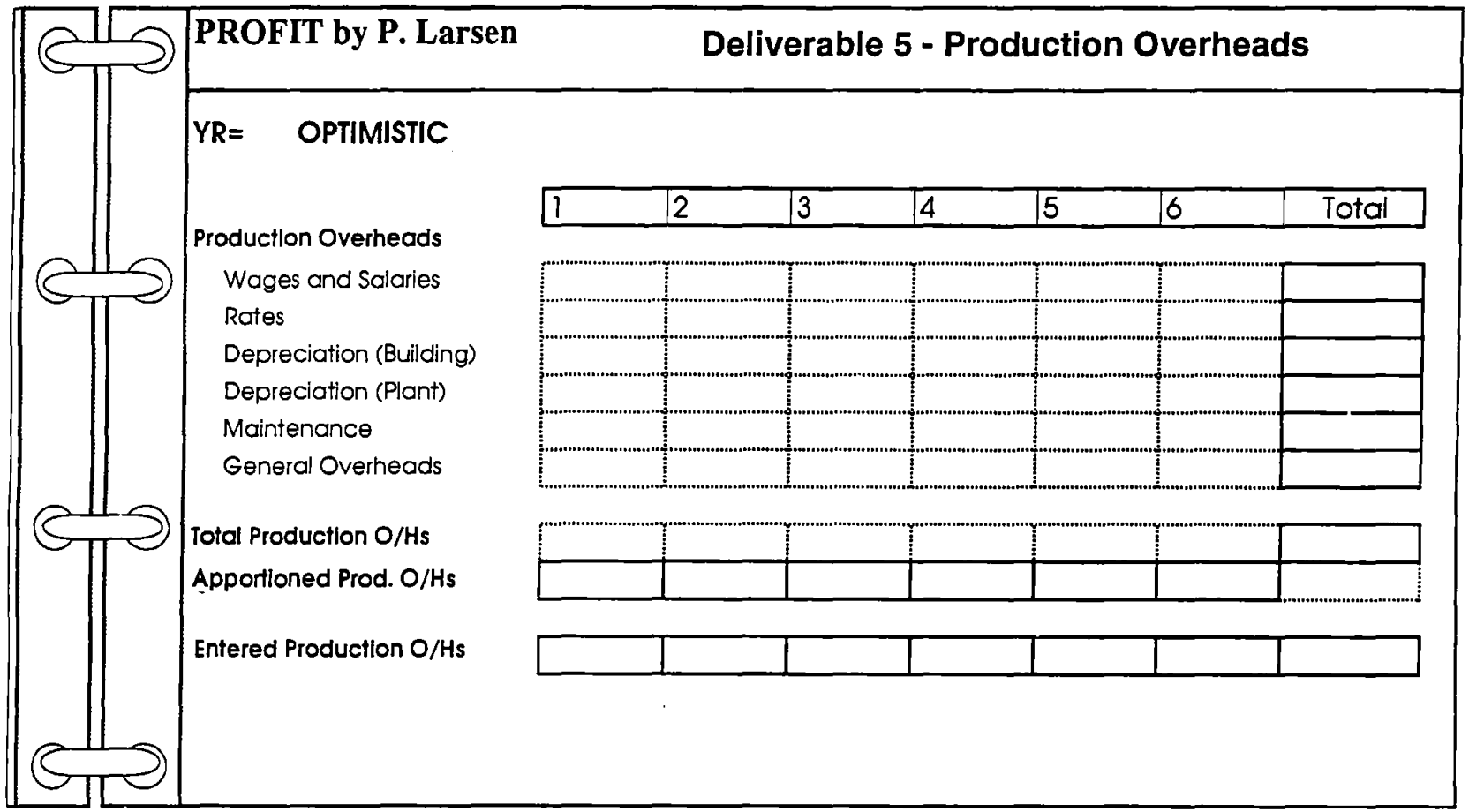
PROFIT by P. Larsen

Deliverable 5 - Bought Out Parts Costs

YR= OPTIMISTIC

	1	2	3	4	5	6	Total
Bought Out Parts							
Opening Stock							
Purchases							
Closing Stock							
Cost of B.O.P. Stock							
Volume of Goods Produced							
Volume Produced							
Total Cost of Bought Out Parts							
Cost per unit							
Percentage Scrap per unit							
Total Cost of Bought Out Parts							


PROFIT by P. Larsen
Deliverable 5 - Work In Progress Costs
YR= OPTIMISTIC
1
2
3
4
5
6
Total
Work In Progress
Opening Stock
Closing Stock
Change In W.I.P
% Scrap
Total W.I.P Used
Apportioned W.I.P Costs
Entered W.I.P Costs

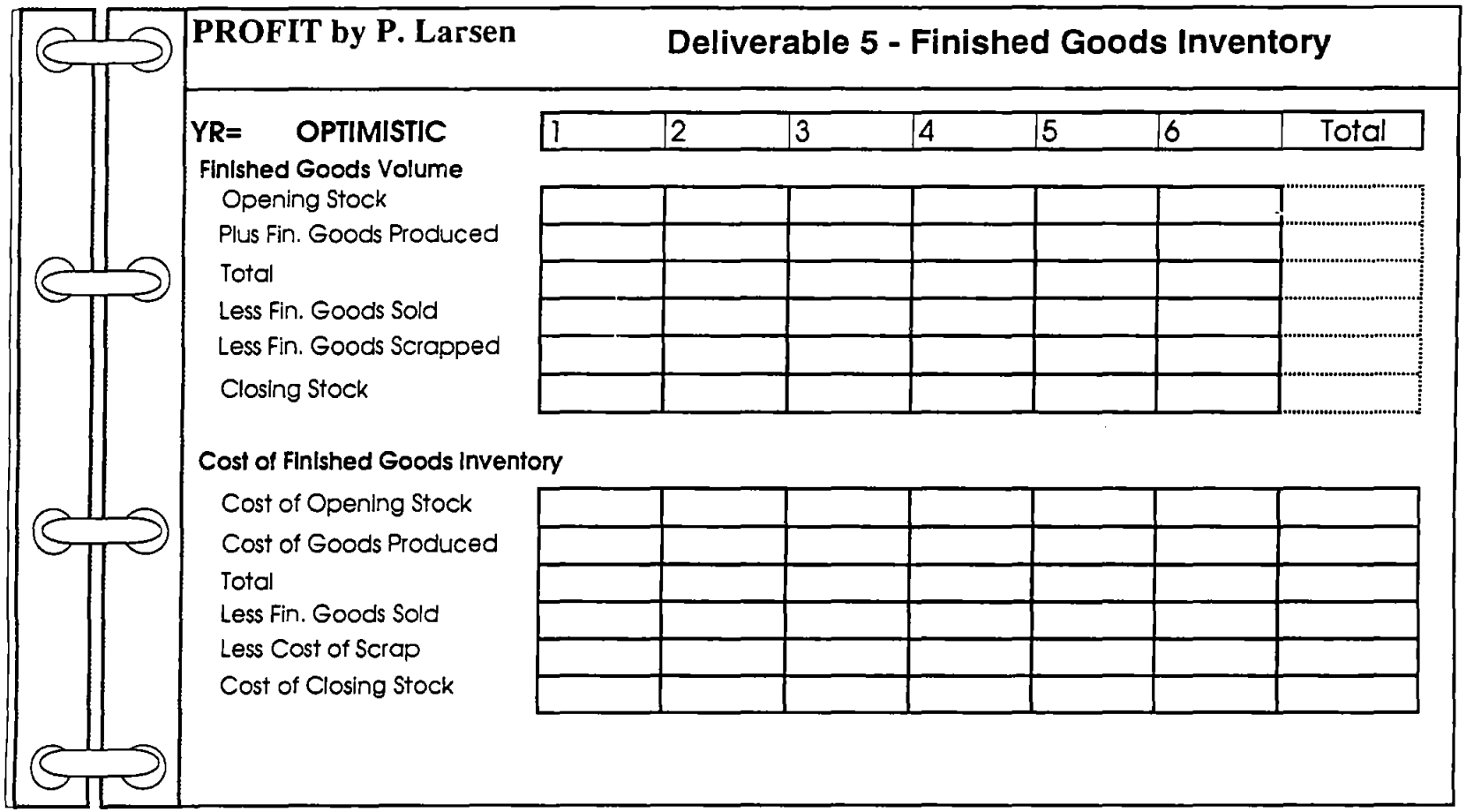


PROFIT by P. Larsen

Deliverable 5 - Production Overheads

YR= **OPTIMISTIC**

	1	2	3	4	5	6	Total
Production Overheads							
Wages and Salaries							
Rates							
Depreciation (Building)							
Depreciation (Plant)							
Maintenance							
General Overheads							
Total Production O/Hs							
Apportioned Prod. O/Hs							
Entered Production O/Hs							

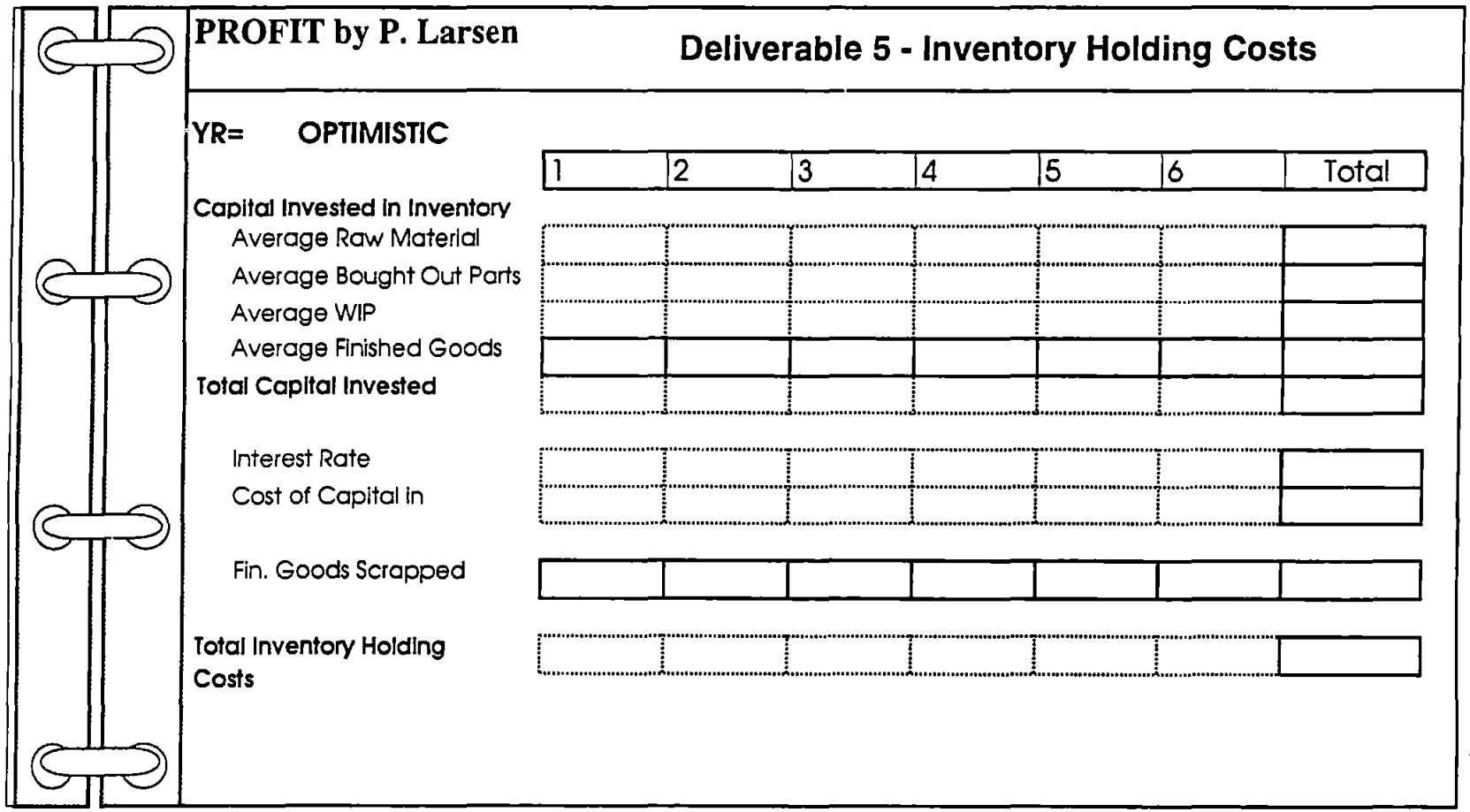


PROFIT by P. Larsen

Deliverable 5 - Finished Goods Inventory

YR= OPTIMISTIC

	1	2	3	4	5	6	Total
Finished Goods Volume							
Opening Stock							
Plus Fin. Goods Produced							
Total							
Less Fin. Goods Sold							
Less Fin. Goods Scrapped							
Closing Stock							
Cost of Finished Goods Inventory							
Cost of Opening Stock							
Cost of Goods Produced							
Total							
Less Fin. Goods Sold							
Less Cost of Scrap							
Cost of Closing Stock							

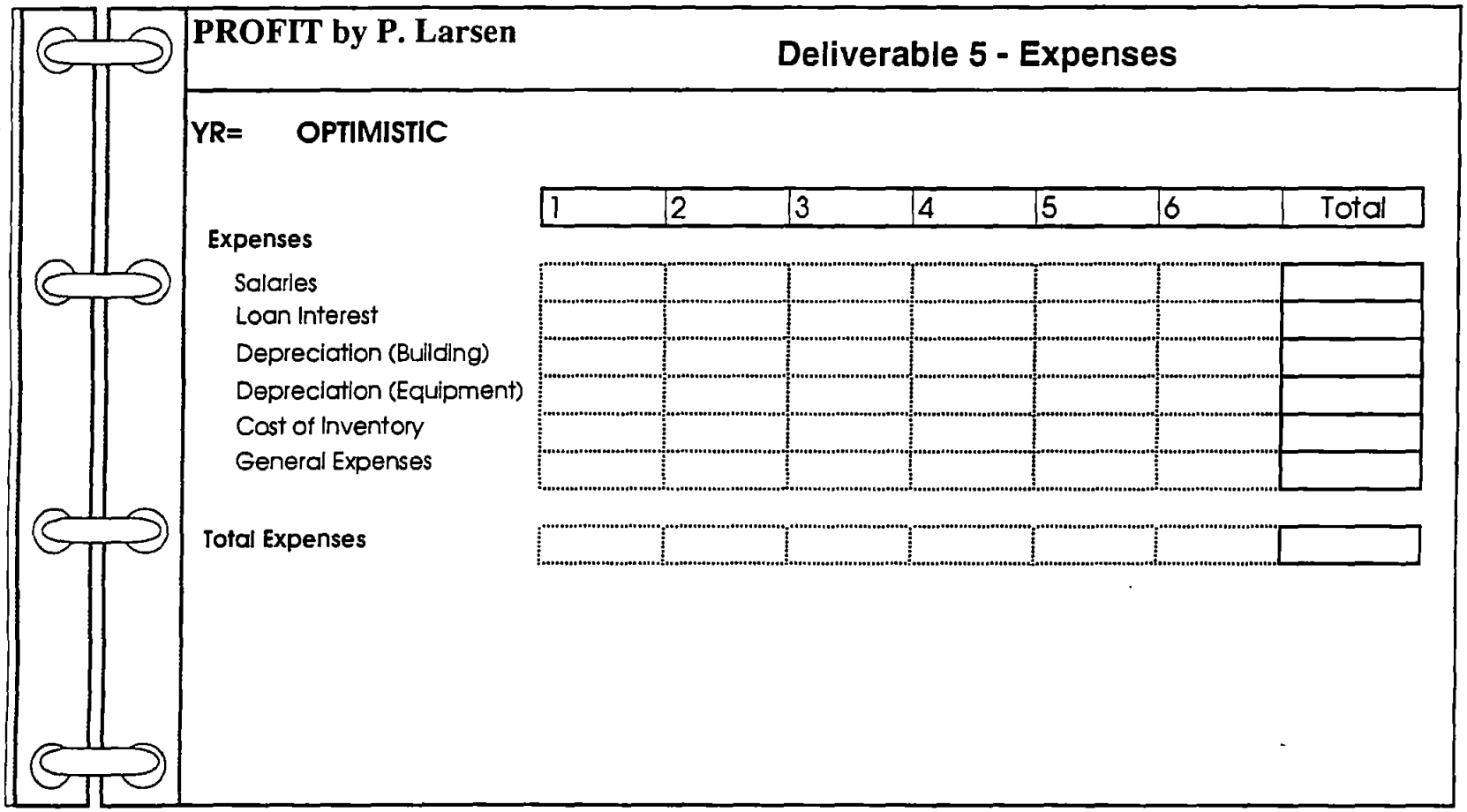


PROFIT by P. Larsen

Deliverable 5 - Inventory Holding Costs

YR= OPTIMISTIC

	1	2	3	4	5	6	Total
Capital Invested in Inventory							
Average Raw Material							
Average Bought Out Parts							
Average WIP							
Average Finished Goods							
Total Capital Invested							
Interest Rate							
Cost of Capital in							
Fin. Goods Scrapped							
Total Inventory Holding Costs							

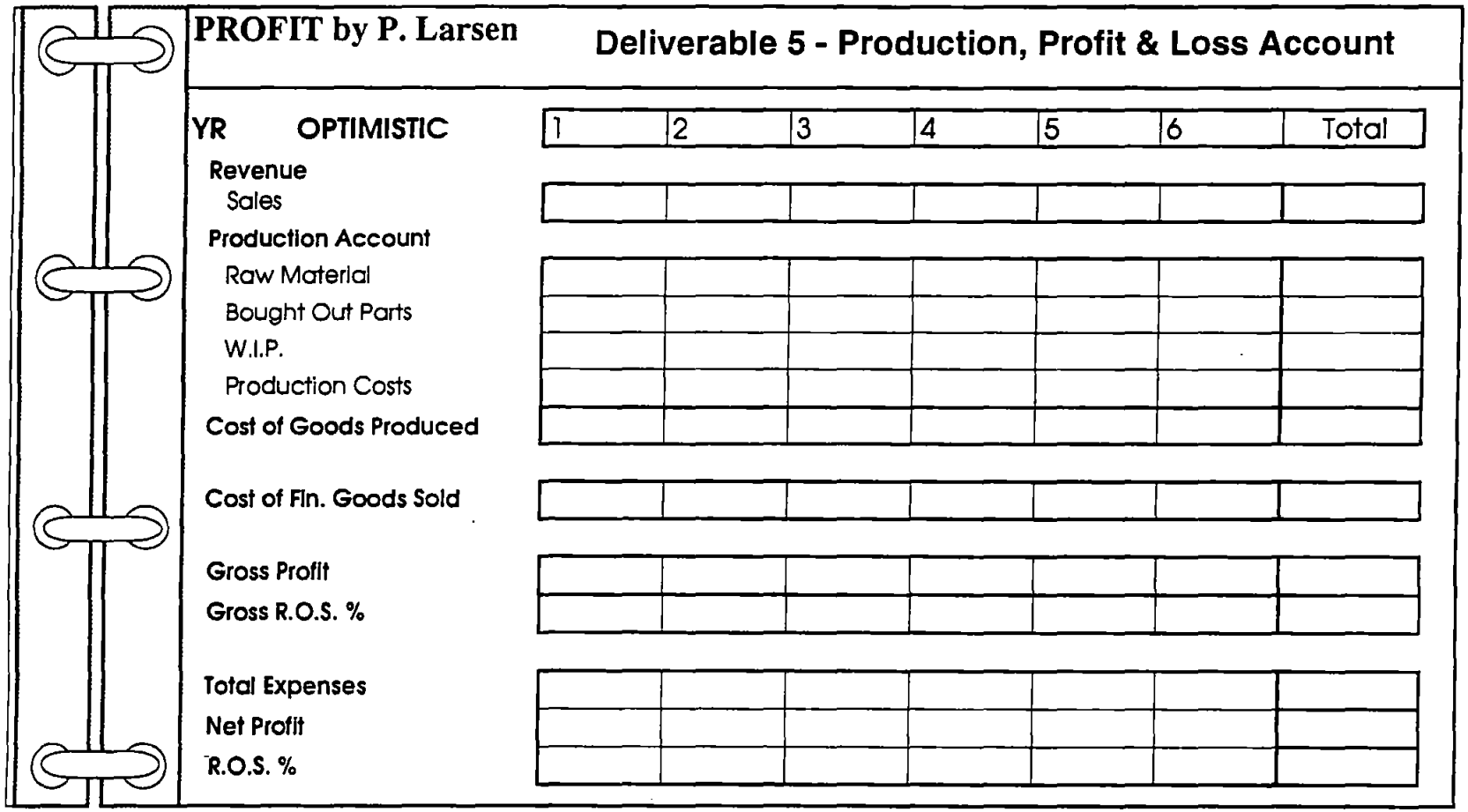


PROFIT by P. Larsen

Deliverable 5 - Expenses

YR= **OPTIMISTIC**

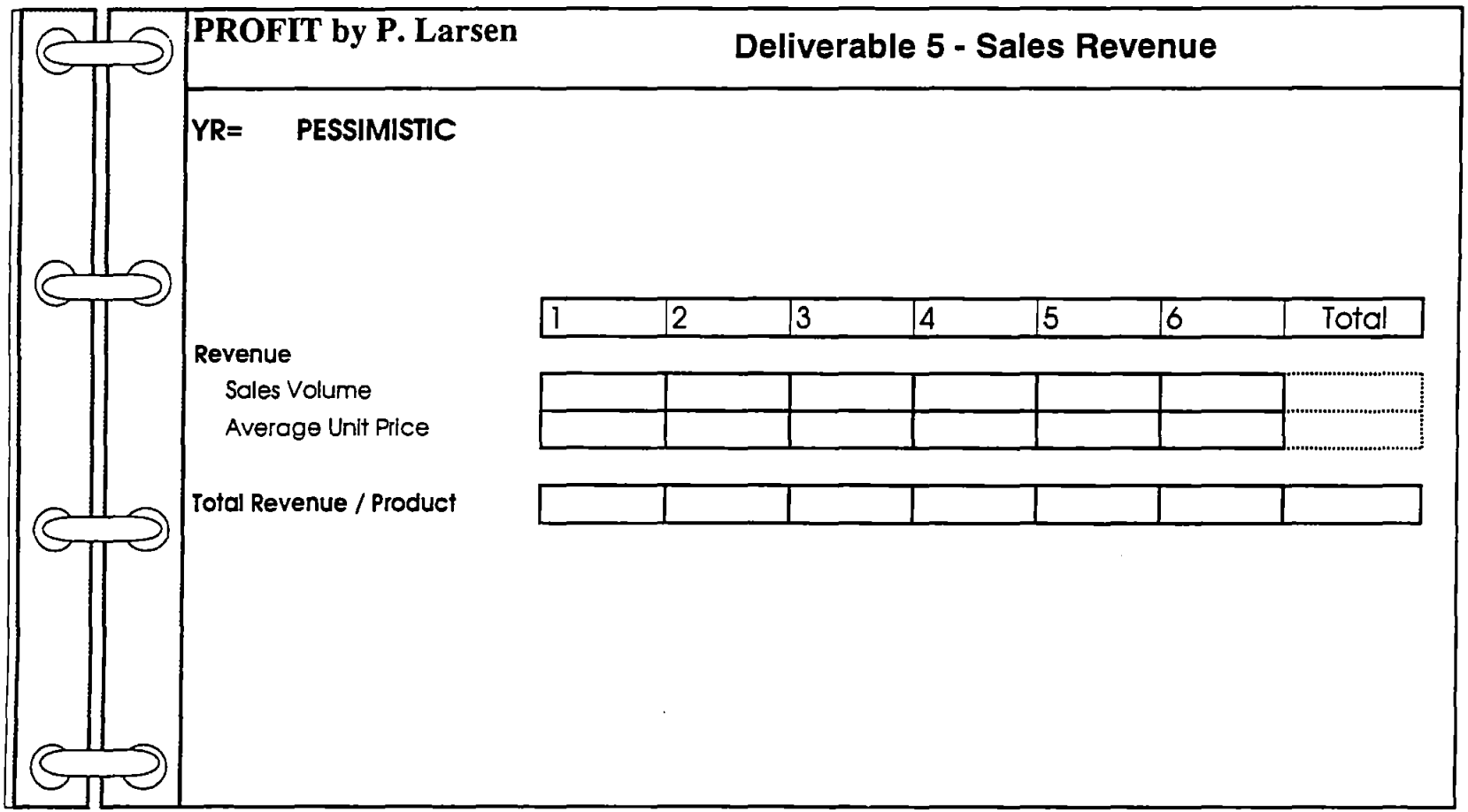
	1	2	3	4	5	6	Total
Expenses							
Salaries							
Loan Interest							
Depreciation (Building)							
Depreciation (Equipment)							
Cost of Inventory							
General Expenses							
Total Expenses							



PROFIT by P. Larsen

Deliverable 5 - Production, Profit & Loss Account

YR OPTIMISTIC	1	2	3	4	5	6	Total
Revenue							
Sales							
Production Account							
Raw Material							
Bought Out Parts							
W.I.P.							
Production Costs							
Cost of Goods Produced							
Cost of Fin. Goods Sold							
Gross Profit							
Gross R.O.S. %							
Total Expenses							
Net Profit							
R.O.S. %							

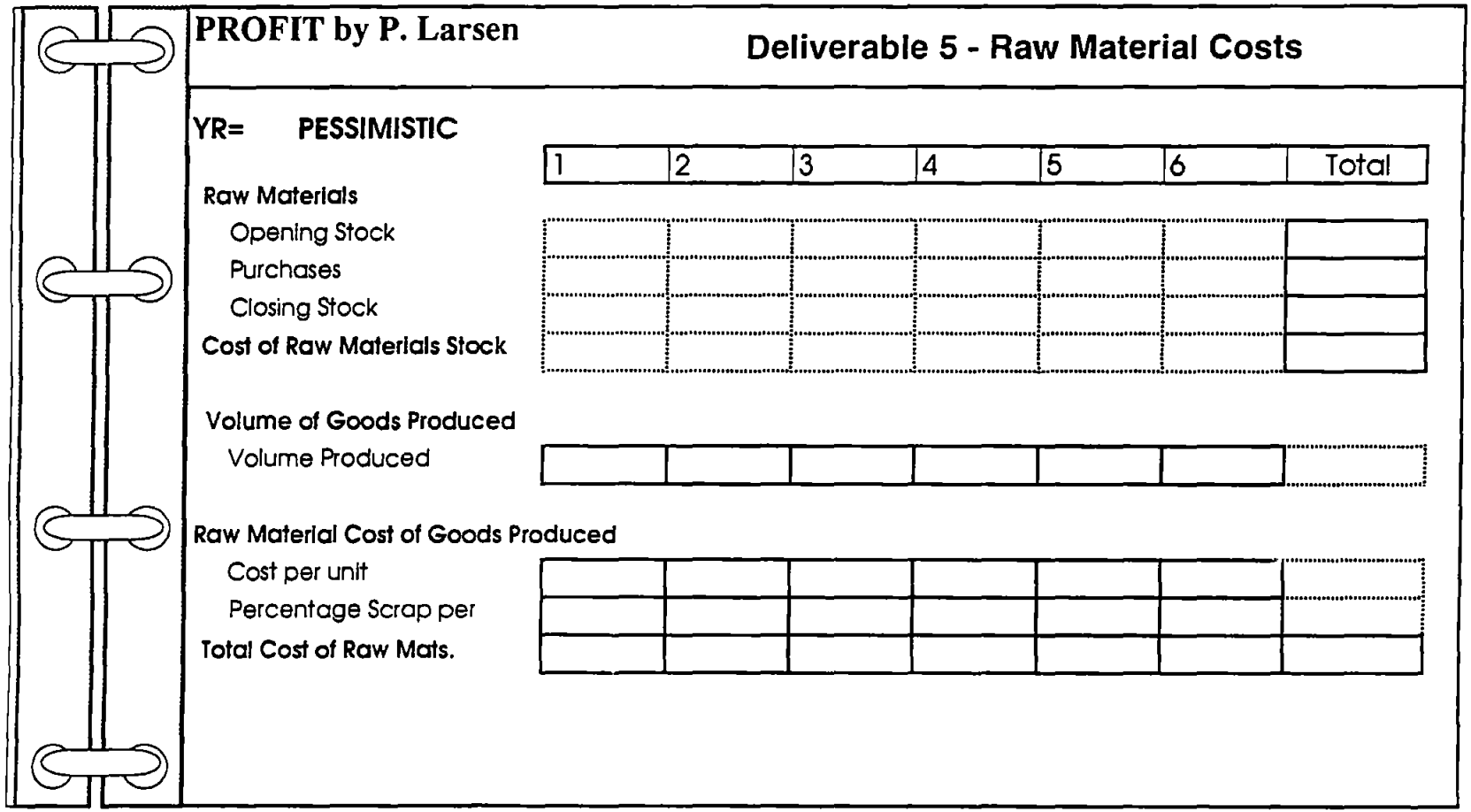


PROFIT by P. Larsen

Deliverable 5 - Sales Revenue

YR= **PESSIMISTIC**

	1	2	3	4	5	6	Total
Revenue							
Sales Volume							
Average Unit Price							
Total Revenue / Product							

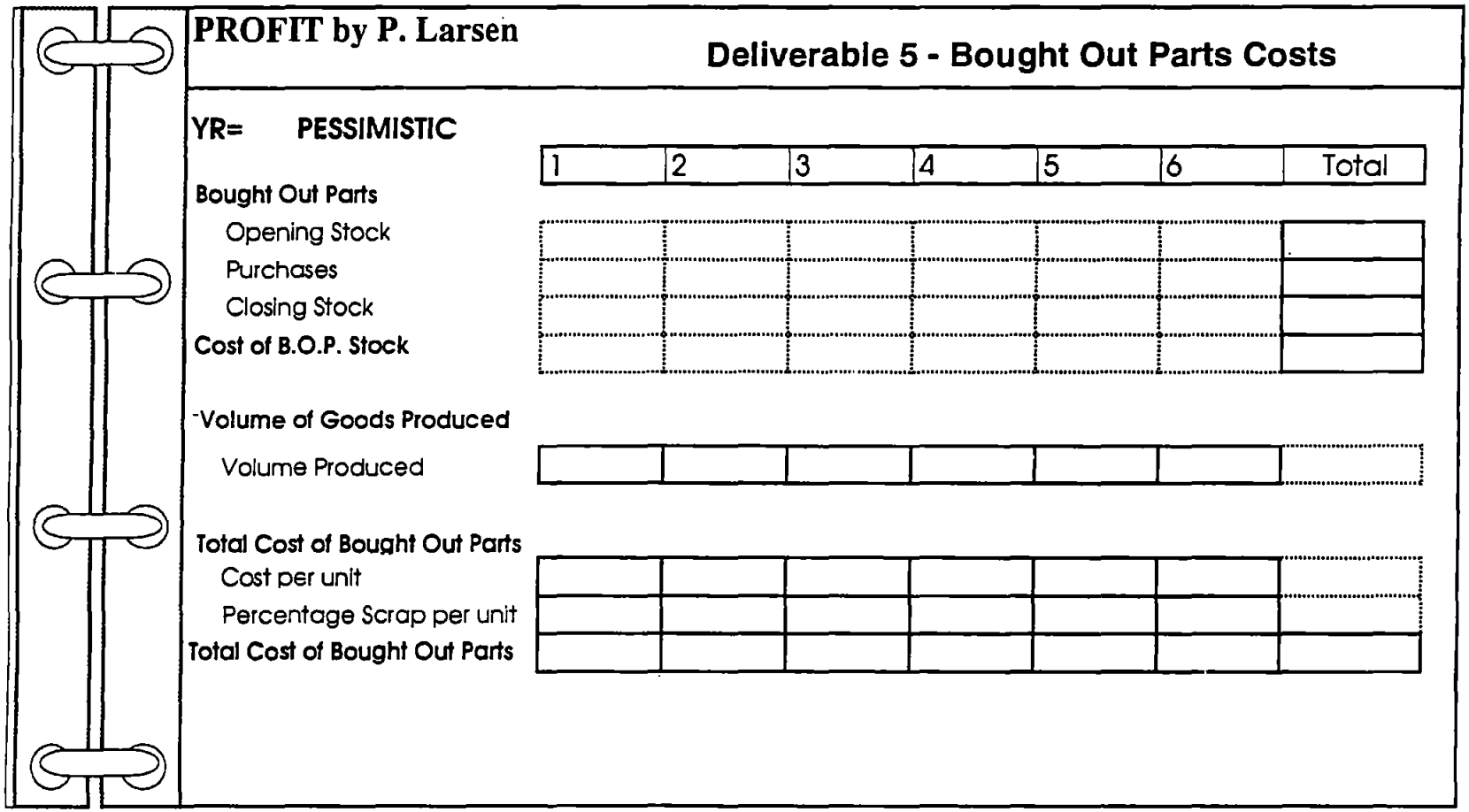


PROFIT by P. Larsen

Deliverable 5 - Raw Material Costs

YR= PESSIMISTIC

	1	2	3	4	5	6	Total
Raw Materials							
Opening Stock							
Purchases							
Closing Stock							
Cost of Raw Materials Stock							
Volume of Goods Produced							
Volume Produced							
Raw Material Cost of Goods Produced							
Cost per unit							
Percentage Scrap per							
Total Cost of Raw Mats.							

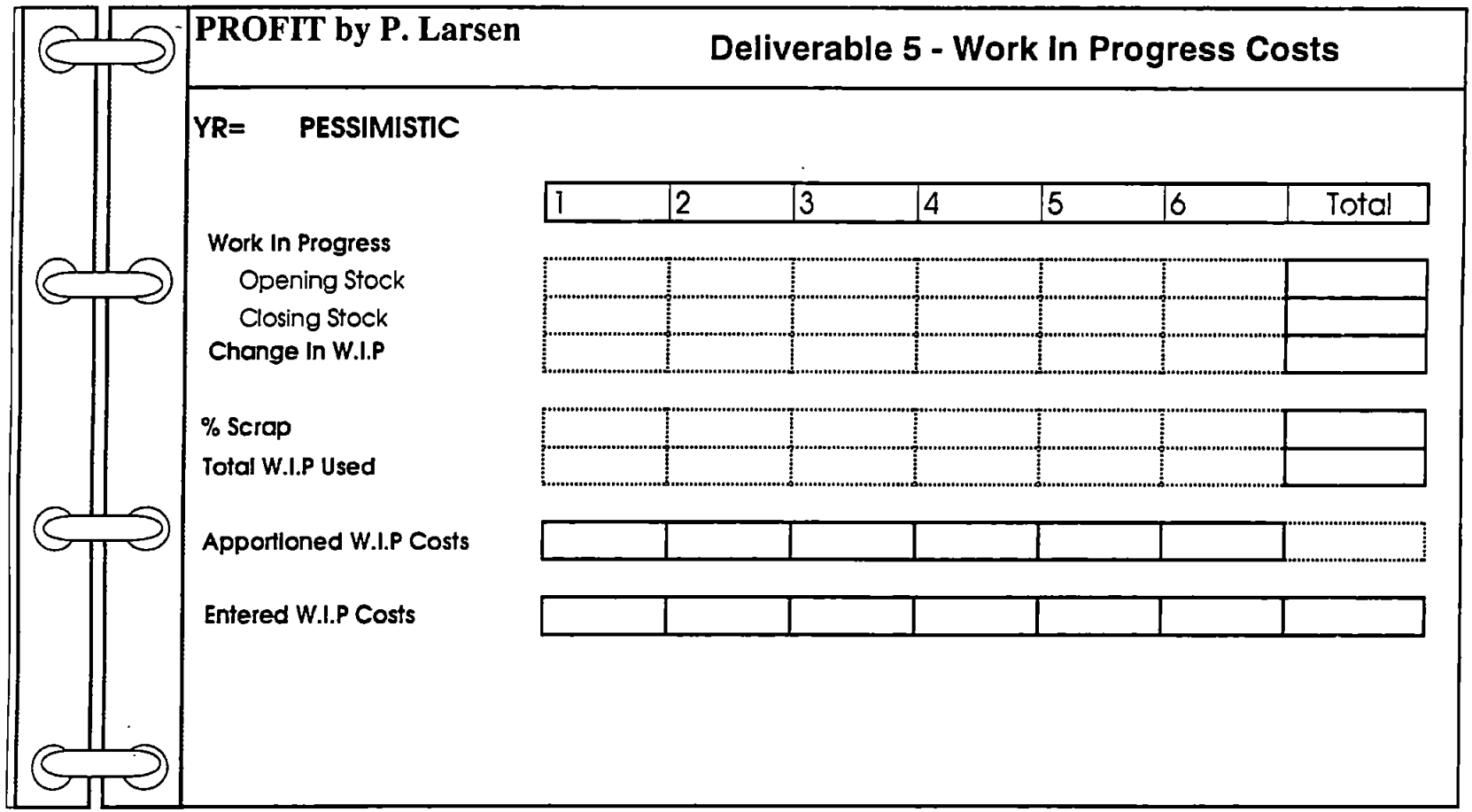


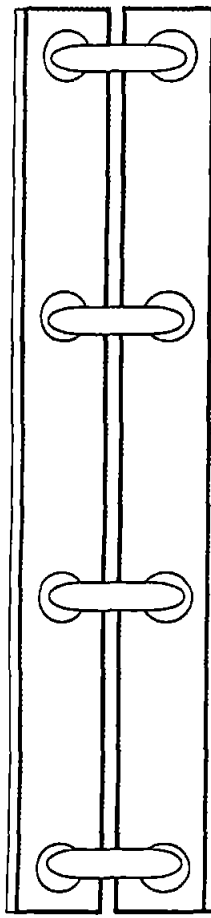
PROFIT by P. Larsen

Deliverable 5 - Bought Out Parts Costs

YR= PESSIMISTIC

	1	2	3	4	5	6	Total
Bought Out Parts							
Opening Stock							
Purchases							
Closing Stock							
Cost of B.O.P. Stock							
Volume of Goods Produced							
Volume Produced							
Total Cost of Bought Out Parts							
Cost per unit							
Percentage Scrap per unit							
Total Cost of Bought Out Parts							


PROFIT by P. Larsen
Deliverable 5 - Work In Progress Costs
YR= PESSIMISTIC
1
2
3
4
5
6
Total
Work In Progress
Opening Stock
Closing Stock
Change In W.I.P
% Scrap
Total W.I.P Used
Apportioned W.I.P Costs
Entered W.I.P Costs

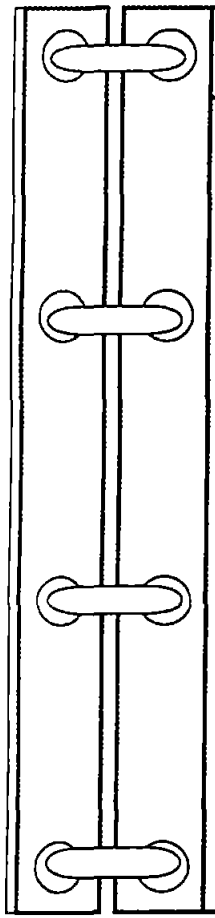


PROFIT by P. Larsen

Deliverable 5 - Production Overheads

YR= **PESSIMISTIC**

	1	2	3	4	5	6	Total
Production Overheads							
Wages and Salaries							
Rates							
Depreciation (Building)							
Depreciation (Plant)							
Maintenance							
General Overheads							
Total Production O/Hs							
Apportioned Prod. O/Hs							
Entered Production O/Hs							

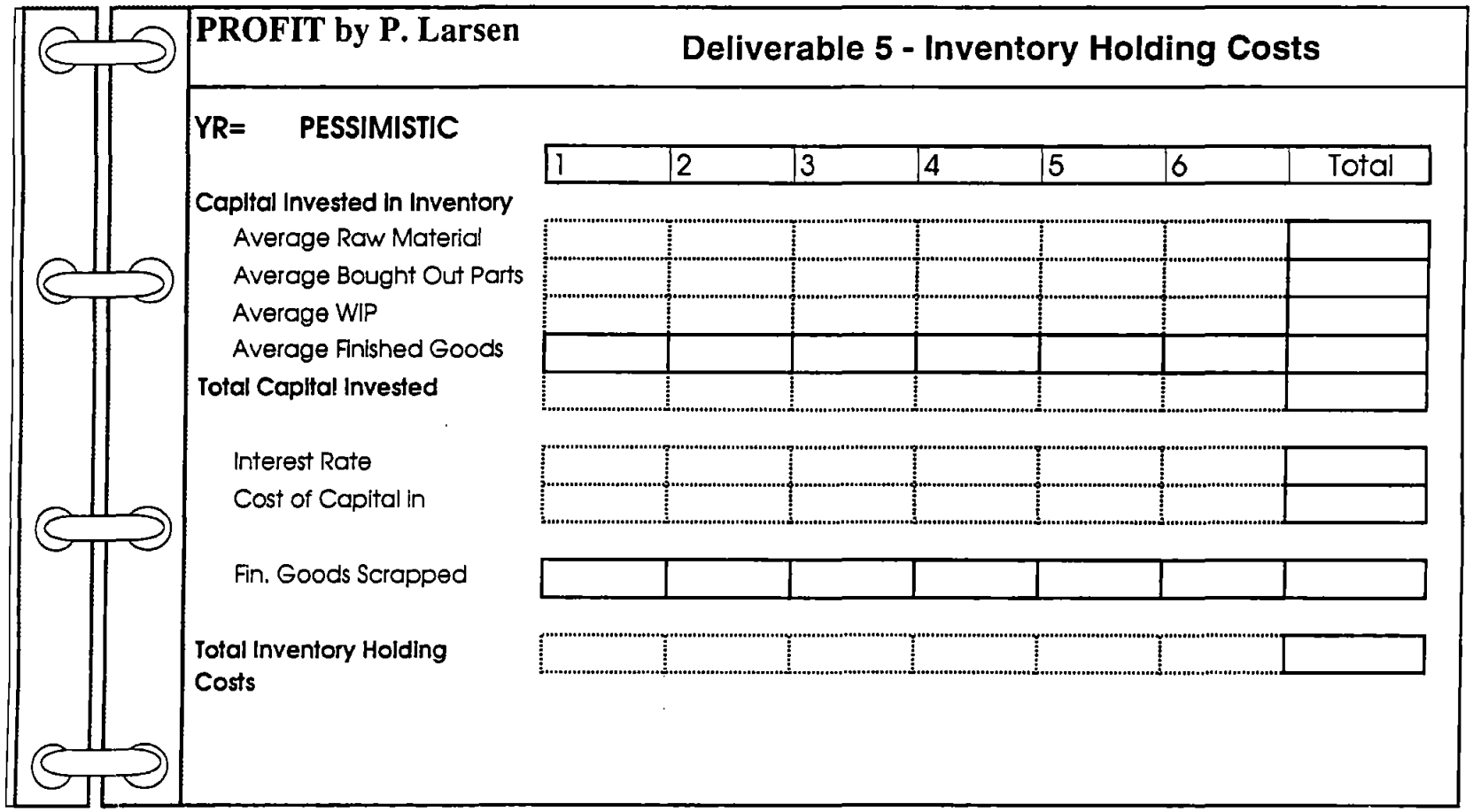


PROFIT by P. Larsen

Deliverable 5 - Finished Goods Inventory

YR= PESSIMISTIC

	1	2	3	4	5	6	Total
Finished Goods Volume							
Opening Stock							
Plus Fin. Goods Produced							
Total							
Less Fin. Goods Sold							
Less Fin. Goods Scrapped							
Closing Stock							
Cost of Finished Goods Inventory							
Cost of Opening Stock							
Cost of Goods Produced							
Total							
Less Fin. Goods Sold							
Less Cost of Scrap							
Cost of Closing Stock							

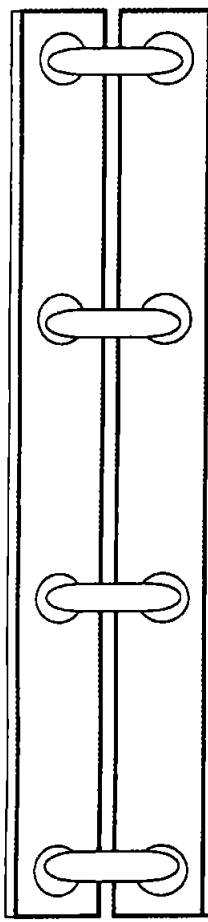


PROFIT by P. Larsen

Deliverable 5 - Inventory Holding Costs

YR= PESSIMISTIC

	1	2	3	4	5	6	Total
Capital Invested in Inventory							
Average Raw Material							
Average Bought Out Parts							
Average WIP							
Average Finished Goods							
Total Capital Invested							
Interest Rate							
Cost of Capital in							
Fin. Goods Scrapped							
Total Inventory Holding Costs							

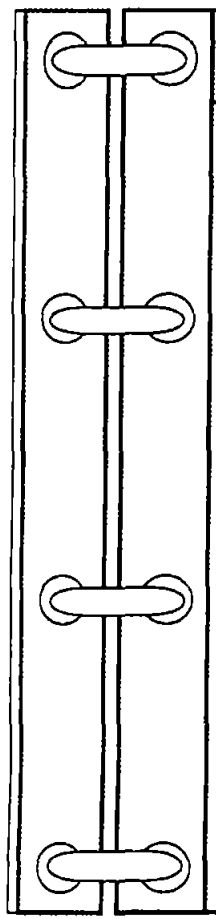


PROFIT by P. Larsen

Deliverable 5 - Expenses

YR= PESSIMISTIC

	1	2	3	4	5	6	Total
Expenses							
Salaries							
Loan Interest							
Depreciation (Building)							
Depreciation (Equipment)							
Cost of Inventory							
General Expenses							
Total Expenses							



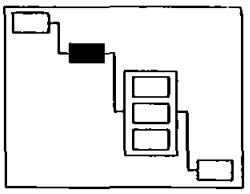
PROFIT by P. Larsen

Deliverable 5 - Production, Profit & Loss Account

YR PESSIMISTIC	1	2	3	4	5	6	Total
Revenue							
Sales							
Production Account							
Raw Material							
Bought Out Parts							
W.I.P.							
Production Costs							
Cost of Goods Produced							
Cost of Fin. Goods Sold							
Gross Profit							
Gross R.O.S. %							
Total Expenses							
Net Profit							
R.O.S. %							

Stage Two - Financial Modelling

Workshop 2



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Product Costing/Estimating, Production and Sales.

Rationale:

The purpose of the first stage of Workshop 2, is to view a model that represents the current financial status of the Company, in Profit and Loss Account format, from the data collected with Deliverables 4.

The second stage requires discussing the values collected on Deliverable 5. This is the Cost of Doing Nothing (CDN), the effect in the future if the company continues as it is without investment. To provide a more realistic view, PROFIT uses values for the Optimistic, Expected and Pessimistic Scenarios. The Steering Committee discusses the values and when agreement has been reached, Deliverable 6 is completed.

The third stage provides the opportunity to view the current financial status for the Company if it continues as it is, for the three Future Scenarios Analyses, that is, the Cost of Doing Nothing.

Actions Required:

Complete:

Deliverable 5 - View future impact on financial status

Deliverable 6 - Agreed Future Scenarios Analysis.

Toolkit 2.1

Entering data for Current Financial Status.

Before Workshop 2 can begin the PROFIT Manager must assure that Deliverable 3, 4 and 5 have been completed.

Deliverable 3 required agreement on the Sales Products to audit, without this agreement Deliverables 4 and 5 could not exist.

Deliverable 4 involves the collection and agreement on the values for the sales revenue and costs, for each of the Sales Products under Audit.

Deliverable 5 involves the collection and agreement on the future financial scenarios.

Deliverable 4.

It is necessary to break down each of the revenue and cost factors for the sales products into their constituent parts, as represented in the Profit and Loss Account to enable changes later on in the PROFIT Methodology to occur.

An example of later changes, necessitating the break down could be:

> If one of the benefits of a new proposal was to increase Product Family sales revenue by say 10%, then PROFIT, to provide a realistic representation of the true value of such a benefit, needs to be able to distinguish between increased sales revenue resulting from increased volume, and increased sales revenue resulting from an increase in unit price.
>
> Increased volume would mean increases in the cost factors - the raw materials, the bought out parts, the production overhead content - reducing the value of the benefit, but if it were just an increase in unit price then these cost factors would not change - maximising the value of the benefit.

The data collected via Deliverable 4 is entered into a modified Production, Profit and Loss account.

The data is first input onto sub-sheets for Sales Revenue, Raw Material Costs, WIP, Expenses, etc., and then when the calculations have been done, the data is added to the Production, Profit and Loss Account. In the CBT the data is automatically input onto the sheet from the sub-sheets.

Warning: If the value in the "Finished Goods Produced - Sub Totals" cell is greater than the value in the "Total Cost of Goods Out - Sub Totals" cell, then the Gross and Net Profits will be increased by the value of the high inventory levels maintained by the Company.

Revenue

Sales Revenue for each Sales Product.

Revenue	SP1	SP2	SP3	SP4	SP5	Other	Total
Sales Volume	5	5	0	0	0	0	
Average Unit Price	70.00	20.00	0.00	0.00	0.00	0.00	
Total Revenue / Product Family	350.00	100.00	0.00	0.00	0.00	0.00	450.00

Sales Revenue is calculated by:

Unit Price x Sales Volume

The Production Account

Cost of Raw Materials Stock is calculated by:

Opening Stock Value + Purchases - Closing Stock Value.

Cost of Raw Materials for Goods Produced is calculated by:
Volume of Goods Produced x (Unit Cost + (Unit Cost x (Unit % Scrap / 100))

Volume of Goods Produced may differ from the volume sold.

Raw Materials	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Opening Stock							120.00
Purchases							202.10
Closing Stock							125.00
Cost of Raw Material Stock							197.10
Volume of Goods Produced							
Volume Produced	5	6	0	0	0	0	
Cost of Goods Produced							
Cost / unit	30.00	6.00	0.00	0.00	0.00	0.00	
Scrap / unit (%)	5.00	10.00	0.00	0.00	0.00	0.00	
Total Raw Material Cost	157.50	39.60	0.00	0.00	0.00	0.00	197.10

Warning: The attention of the user should be drawn to the Cost of Raw Material Stock Value and the Total Raw Material Cost Value. These two values **should be** the same. If they are **not**, then the user must **adjust** them until they are, before continuing.

Bought Out Part Costs for each sales product are calculated in exactly the same manner as Raw Materials.

Warning: The attention of the user should be drawn to the Cost of Bought Out Parts Stock Value and the Total Bought Out Parts Cost Value. These two values **should be** the same. If they are **not**, then the user must **adjust** them until they are, before continuing.

Work In Progress

Where the Company knows the value of WIP for each Sales Product or where it disagrees with the method of apportionment adopted by PROFIT it can enter its own values. The PROFIT CBT will automatically ascertain if this is the case.

Work In Progress	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Opening Stock							60
Closing Stock							50
Change In W.I.P							10
% Scrap							10.00
Apportioned W.I.P Costs	8.19	2.81	0.00	0.00	0.00	0.00	11.00
Entered W.I.P Costs	5.75	5.25	0.00	0.00	0.00	0.00	11.00

Apportioned Work In Progress (WIP) is calculated by:

The WIP figure can either be entered by the user for each Sales Product or it can be entered as a lump sum and apportioned by PROFIT.

The figure for the Apportioned WIP is calculated by first collecting data for the following:

1. Average Unit Price for each sales product.
   Volume Produced from Raw Materials for each sales product.
   Volume Produced from Bought Out Parts for each sales product.

2. The Unit Apportionment Variable for each sales product is then calculated by:

   Average Unit Price x (Volume Produced from Raw Materials + Volume Produced from Bought Out Parts)

3. The Total Unit Apportionment Variable for all Sales Products is then calculated by summing the individual Unit Apportionment Variables. That is:

   Unit Apportionment Variable for Sales Product 1 +
   Unit Apportionment Variable for Sales Product 2 +
   Unit Apportionment Variable for Sales Product 3 +, etc.

4. The Apportionment Variable for each sales product is calculated by:

   Unit Apportionment Variable / Total Unit Apportionment Variable.

5. The WIP for each Sales Product can then be calculated by

   Apportionment Variable x (Change in WIP + %Scrap WIP/100)

Production Overheads

Where the Company knows the value of Production Overheads for each Sales Product or where it disagrees with the method of apportionment adopted by PROFIT, the Company can enter its own values. The PROFIT CBT will automatically ascertain if this is the case.

Apportioned Production Overheads are calculated by:

Production Overheads	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Direct Labour							50.00
Rates							10.00
Depreciation (Building)							5.00
Depreciation (Plant)							6.00
Maintenance							4.00
Other Overheads							20.00
Total Production O/heads							95.00
Apportioned Prod. O/heads	70.74	24.26	0.00	0.00	0.00	0.00	
Entered Prod. O/heads							

The Total Production Overheads are apportioned to each individual Sales Product in the same manner as WIP.

Finished Goods Inventory

The **Opening Stock Volume** is added to the **Volume Produced** to give the **Total. Finished Goods Sold** and **Finished Goods Scrapped** are subtracted from the **Total**. This provides the **Closing Stock Volume**.

Finished Goods Volume	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Opening Stock	2	2					
Plus Fin. Goods Produced	5	6					
Total	7	8					
Finished Goods Sold	5	5					
Finished Goods Scrapped	0	2					
Closing Stock	2	1					
Cost Finished Goods Produced							
Cost of Opening Stock	94.58	22.22					
Cost of Goods Produced	236.45	66.66					
Total	331.03	88.88					
Cost of Goods Sold	236.45	55.55					
Cost of Goods Scrapped	0.00	22.22					
Cost of Closing Stock	94.58	11.11					

The **Costs** for the **Finished Goods Stock** is calculated by multiplying the **Unit Cost** for each Sales Product by the **Volume** for each Sales Product.

The Unit Cost is calculated by:

Cost of Goods Produced / Volume of Finished Goods Produced

Cost of Goods Produced, for each Sales Product, is calculated by:

(Raw Material cost + Bought Out Part cost + WIP cost + Production Overhead) divided by Volume Produced.

Inventory Holding Costs.

Capital Invested in Inventory	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Average Raw Material							122.50
Average Bought Out Parts							0.00
Average WIP							55.00
Average Finished Goods	94.58	16.56					111.14
Total Capital Invested							288.64
Interest Rate %							10.00
Cost of Capital in Inventory							28.86
Cost of Goods Scrapped	0.00	22.22					22.22
Total Inventory Holding Costs							51.08

The **Inventory Holding Costs** are calculated by:

(Total Cost of Average Inventory Held x Interest Rate) + Finished Goods Scrap.

The Total Cost of Average Inventory Held is calculated by:

Average Cost of Inventory of Raw Materials +
Average Cost of Inventory of Bought Out Parts +
Average Cost of Inventory of WIP +
Average Cost of Inventory of Finished Goods.

Cost of Average Inventory Held is calculated by:

(Opening Stock + Closing Stock)/ 2

The Average Finished Goods value is the sum of the Average Inventory for each Sales Products.

The Rate of Interest is commonly based on the rate that a company could have achieved if it had invested the money in alternative investments.

The Finished Goods Scrap is the total value of the Finished Goods scrapped for each Sales Product.

Expenses

The Expenses are the Company Wide costs, or as they are also referred to, General Expenses. The Expenses are all other costs not covered in the Production Account and the Trading Account.

Expenses	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Salaries							25.00
Loan Interest							0.00
Depreciation (Building)							30.00
Depreciation (Equipment)							20.00
General Expenses							10.00
Cost of Inventory							51.08
Total Expenses							136.08

The Expenses - Represented by Salaries, Loan Interest, Depreciation - Buildings and Equipment and General Expenses - are suggested titles. Each company can enter titles appropriate to its requirements. Expenses are not apportioned to Sales Products.

Total Expenses are **not** apportioned to Sales Products. **Total Expenses** are calculated by:

Expenses + Total Inventory Holding Costs.

The Production, Profit and Loss Account.

Production, Profit and Loss Account							
	SP1	SP2	SP3	SP4	SP5	Other	Sub Totals
Revenue							
Sales	350.00	100.00	0.00	0.00	0.00	0.00	450.00
Production Account							
Raw Material	157.50	39.60	0.00	0.00	0.00	0.00	197.10
Bought Out Parts	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W.I.P.	8.19	2.81	0.00	0.00	0.00	0.00	11.00
Production Costs	70.74	24.26	0.00	0.00	0.00	0.00	95.00
Cost of Goods Produced	236.43	66.67	0.00	0.00	0.00	0.00	303.10
Cost of Finished Goods Sold	236.45	55.55	0.00	0.00	0.00	0.00	292.00
Gross Profit	113.55	44.45	0.00	0.00	0.00	0.00	158.00
Gross R.O.S. %	32.4%	44.5%	0.0%	0.0%	0.0%	0.0%	35.1%
Total Expenses							136.08
Net Profit							21.92
R.O.S. %							4.9%

Gross Profit is calculated by:

Sales Revenue - Cost of Finished Goods Sold.

Gross ROS is calculated by:

Gross Profit / Sales Revenue.

Net Profit for the whole Company is calculated by:

Total Sales Revenue for all the Sales Products - (Total Cost of Goods Sold for all the Sales Products + Total Expenses).

ROS is calculated by:

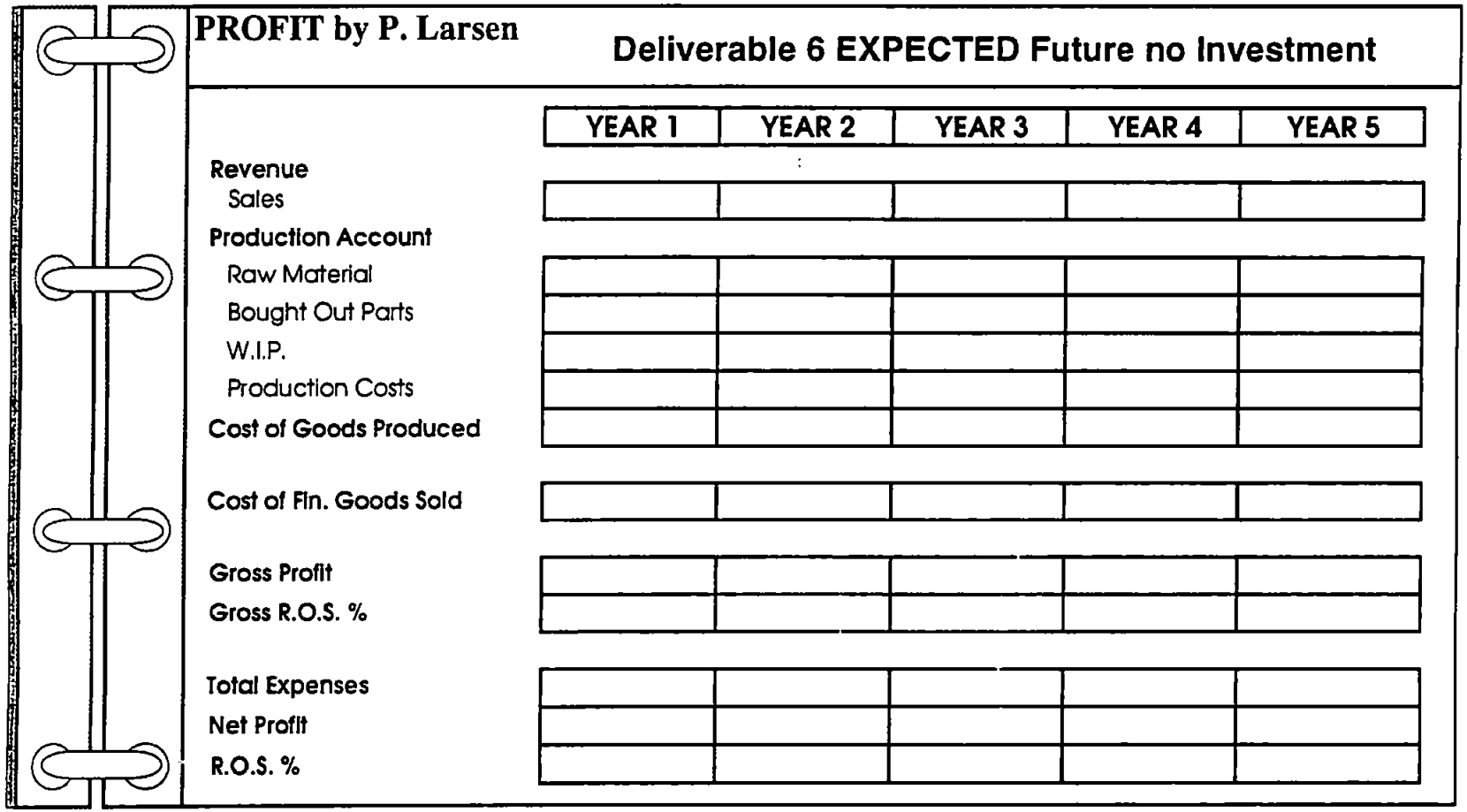
Net Profit / Total Sales Revenue.

Toolkit 2.2

The second step of Workshop 2 is to consider Deliverable 5 (D5) the Scenario Analysis Data.

It can be vital to the survival of a company to consider the consequences for the Company if it just carried on trading as it was, that is, without investing in new technologies, improvement programmes, using new methods, etc..

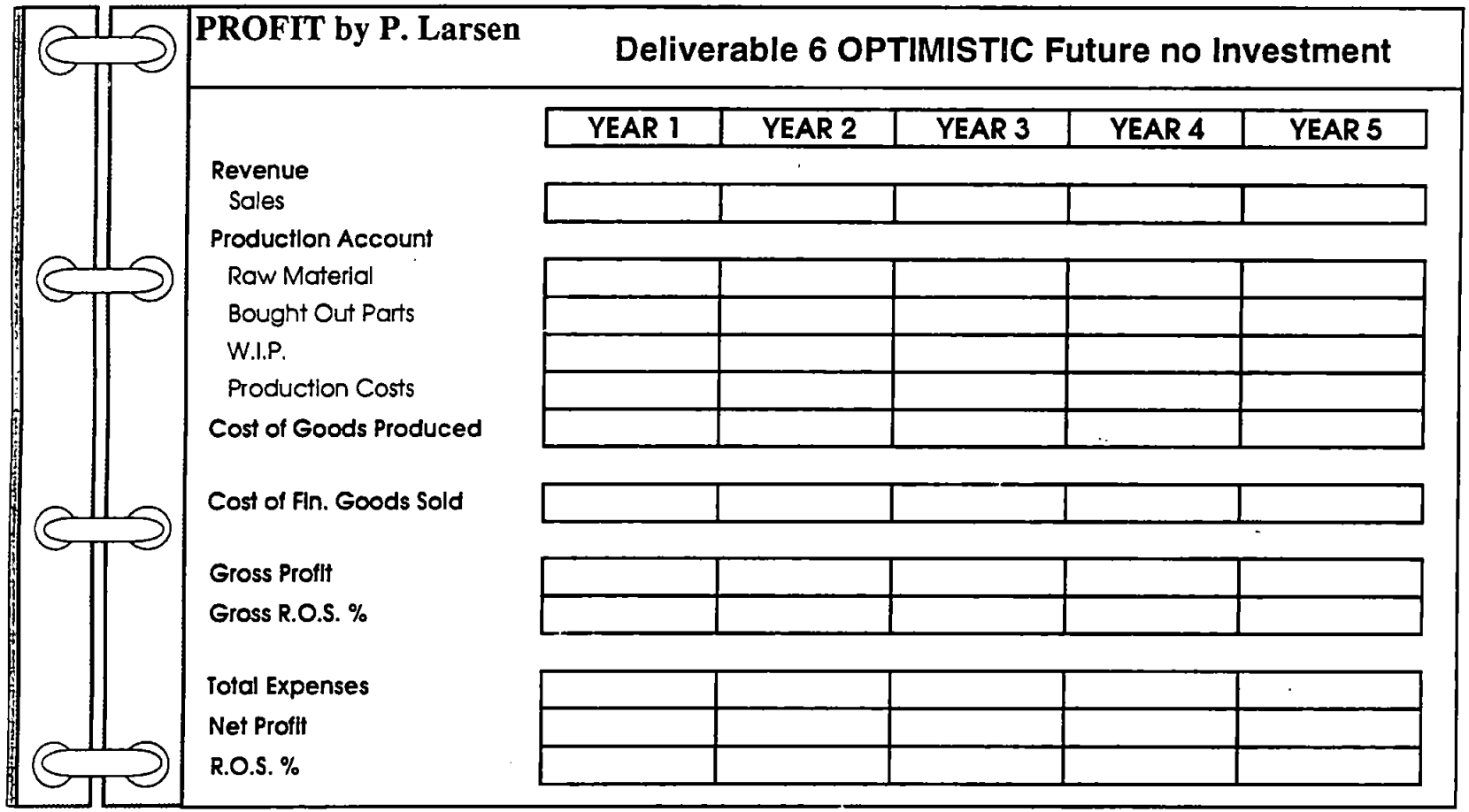
The Cost of Doing Nothing (CDN), involves specifying, for a time period of up to five years, the values for Sales Revenue and Cost factors. To provide a more realistic view PROFIT requests values for the Optimistic, Expected and Pessimistic Scenarios. The Steering Committee then discuss the values and when agreement has been reached, Deliverable 6 is completed, for each of the Future Scenarios, over the agreed time period.



PROFIT by P. Larsen

Deliverable 6 EXPECTED Future no Investment

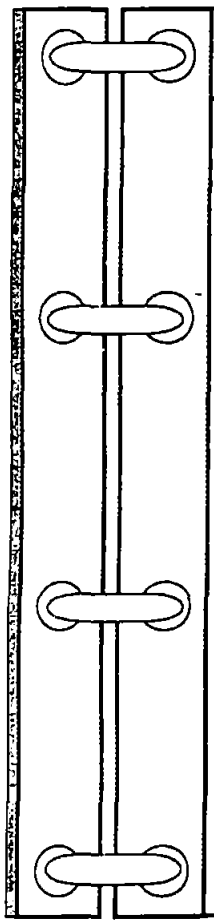
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Revenue					
Sales					
Production Account					
Raw Material					
Bought Out Parts					
W.I.P.					
Production Costs					
Cost of Goods Produced					
Cost of Fin. Goods Sold					
Gross Profit					
Gross R.O.S. %					
Total Expenses					
Net Profit					
R.O.S. %					



PROFIT by P. Larsen

Deliverable 6 OPTIMISTIC Future no Investment

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Revenue					
Sales					
Production Account					
Raw Material					
Bought Out Parts					
W.I.P.					
Production Costs					
Cost of Goods Produced					
Cost of Fin. Goods Sold					
Gross Profit					
Gross R.O.S. %					
Total Expenses					
Net Profit					
R.O.S. %					



PROFIT by P. Larsen

Deliverable 6 PESSIMISTIC Future no Investment

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Revenue					
Sales					
Production Account					
Raw Material					
Bought Out Parts					
W.I.P.					
Production Costs					
Cost of Goods Produced					
Cost of Fin. Goods Sold					
Gross Profit					
Gross R.O.S. %					
Total Expenses					
Net Profit					
R.O.S. %					

Toolkit 2.3

The third step of Workshop 2 requires the Steering Committee to view the effect the Future Scenarios Analysis Data will have on the Profit and Loss account and the Return on Sales, for the three scenarios (Deliverable 6). The Company can then gain an insight into the urgency involved in new investment.

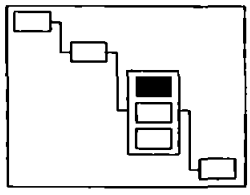
After analysis of the three versions of Deliverable 6, the PROFIT Steering Committee must decide which of the three options available they are to pursue.

The three options are:

1. Identify Business Need.
2. Select Business Need and Identify Proposal(s).
3. Evaluate Proposal(s).

Stage Three - Option One Identify Business Needs

Workshop 3.1



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Production and Sales.

Rationale:

The purpose of Workshop 3.1 is to identify the Business Need(s) of the Company.

In order to identify and hone the investment to the most profitable Business Need, the PROFIT CBT requires the user to experiment with the values on the Profit and Loss Account by rotating the Sales Revenue, Cost of Sales and Expenses factors.

For example: What would be the effect if Sales Revenue were to increase by maximising the volume produced of Sales Product A? What effect would this have on the Company Wide Net Profit and ROS?

When the Steering Committee are confident they have exhausted all possibilities, they then compare the changes with the Profit & Loss Account Factors to Business Needs Matrix shown in Toolkit 3.1, which provides a guide to selecting possible Business Needs. Toolkit 3.1 also provides explanations of the business needs.

When the Steering Committee have reached agreement, on which Business Need(s), they complete Deliverable 7 - Agreed Business Needs.

Actions Required:

Tasks:

Rotate revenue and cost factors.

Compare changes with business need explanations.

Discuss possible business needs.

Complete:

Deliverable 7 - Agreed Business Need(s).

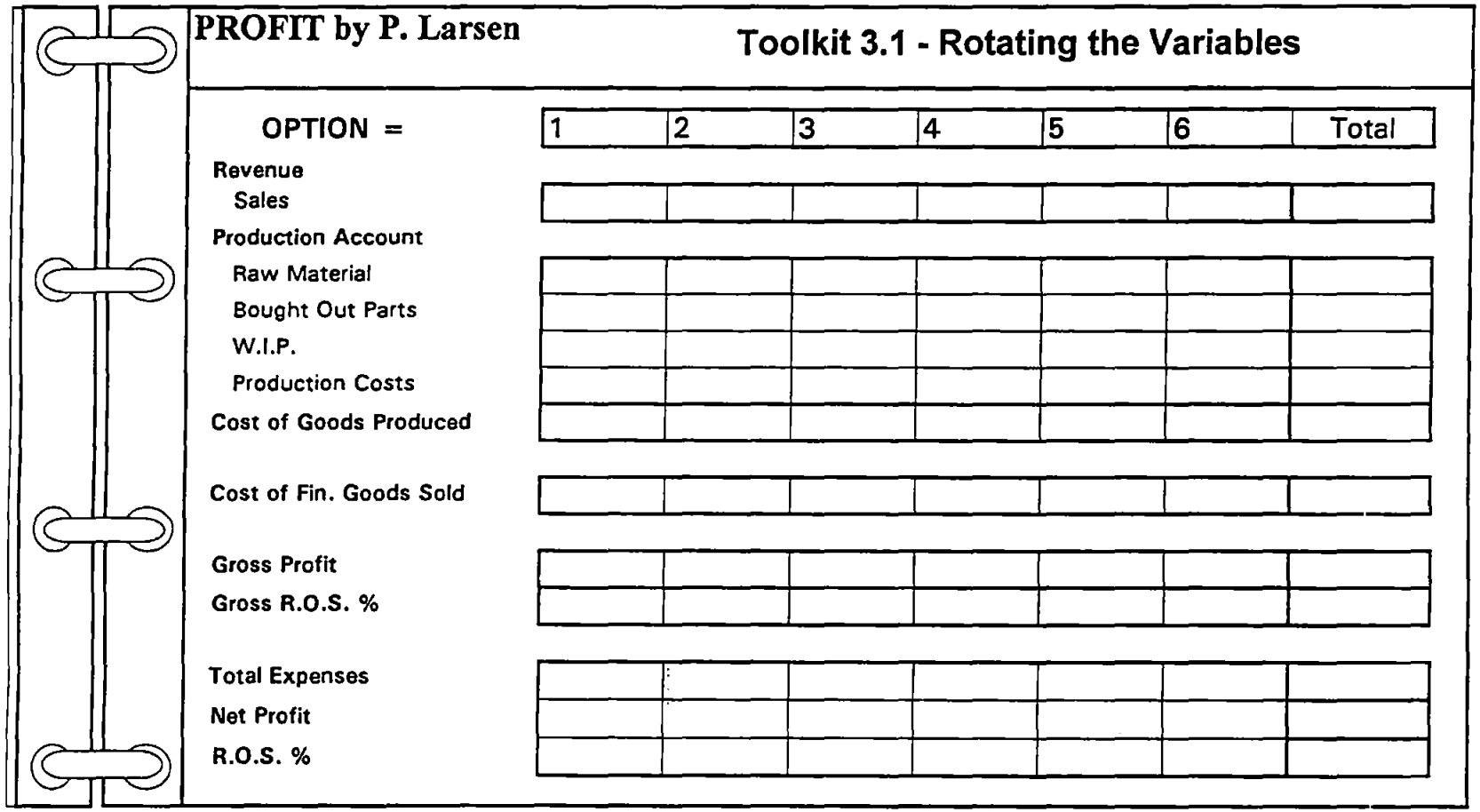
Toolkit 3.1.

Rotating the Variables

By rotating the variables, that is, the Sales Revenue factors and the Cost of Sales factors and the Expenses, a company can gain an understanding of the financial implications involved in changing the variables.

The Record Sheet can be used to record the results of each change of the variables. The user is advised top photocopy the Record Sheet if more than one record is likely to be prepared.

The Profit & Loss Account Factors to Business Needs Matrix helps guide the user towards possible business needs dependent on which changes in the Profit and Loss Account have occurred.



PROFIT by P. Larsen

Toolkit 3.1 - Rotating the Variables

OPTION =	1	2	3	4	5	6	Total
Revenue							
Sales							
Production Account							
Raw Material							
Bought Out Parts							
W.I.P.							
Production Costs							
Cost of Goods Produced							
Cost of Fin. Goods Sold							
Gross Profit							
Gross R.O.S. %							
Total Expenses							
Net Profit							
R.O.S. %							

Help:
Use this Production, Profit and Loss Account to calculate and or record changes to the Sales Revenue and Cost Factors when Rotating the Variables.

Identifying Business Need(s).

In the PROFIT Methodology, Business Needs have been categorised under the following headings:

1. Reduce Costs.
2. Reduce Lead Time.
3. Improve Delivery Performance.
4. Improve Product Quality.
5. Improve Customer Service.
6. Improve Functionality and Features.
7. Increase Capacity.

Increased Sales Revenue could be considered a Business Need. But to increase the unit price without offering the customer an improvement in quality, lead time, delivery performance, customer service or functionality and features, it is likely that increased prices will be reflected in decreased sales volume, thereby, cancelling out the expected increase in Sales Revenue. To increase volume is largely dependent on the current capacity constraints of the company, therefore, for a company intending to increase Sales Revenue by increasing volume, their Business Need would be to Increase Capacity.

For these reasons the PROFIT Methodology restricts consideration of Business Needs to those specified above. However, when considering the benefits of any investments, it is vital that the effect the investment(s) might have on the Sales Revenue be considered.

In identifying possible Business Needs from changes in the Production, Profit and Loss Account the user should refer to the eight flow charts that follow the explanations of the Business Needs.

An explanation of each Business Need follows:

1. Reduce Costs.

In looking to reduce costs a company has identified that its Sales Products are being produced at too higher a price or that the Expenses for the whole company are too great. Sales product costs in a company relate to raw materials, bought

out parts, work in progress, finished goods inventory, scrap rates, production overheads - including direct labour, energy consumption, machine purchase repayments, etc. Company wide costs are covered by expenses - Salaries, administration, selling, maintenance, cost of holding inventory, depreciation of buildings and plant not covered by production overheads or directly related to sales product costs.

2. Reduce Lead Time.

By reducing lead time, the length of time it takes to manufacture a product, a company could expect to increase its sales, reduce its costs - quicker throughput results in greater turnover of stock, increased sales could provide for reductions through increased quantities of raw material and bought out parts - economics of scale. Reducing idle time and set-ups reducing lead time by better use of machinery and plant.

3. Improve Delivery Performance.

Delivery performance relates to the time quoted to deliver products to customers. Poor delivery performance forcing customers to wait, can result in lost orders. Even where a company competes well on quality and price, customers who require a product urgently might not be prepared or able to wait.

4. Improve Product Quality.

Improved quality can command a higher unit price, thereby, increasing profits without increasing product costs. A dissatisfied customer is likely to complain to twelve other people about the problem, whereas, with a good quality product a customer will tell four other people. Can your company afford to gain a poor quality reputation? Improved product quality means reduced scrap and rework, reducing production costs, raw material costs, direct labour and production overheads, reduced warranty claims, insurance, etc.

5. Improve Customer Service.

Customer service relates to areas such as, after sales service, customer complaints, enquiries, requests for brochures and price lists. Improving customer

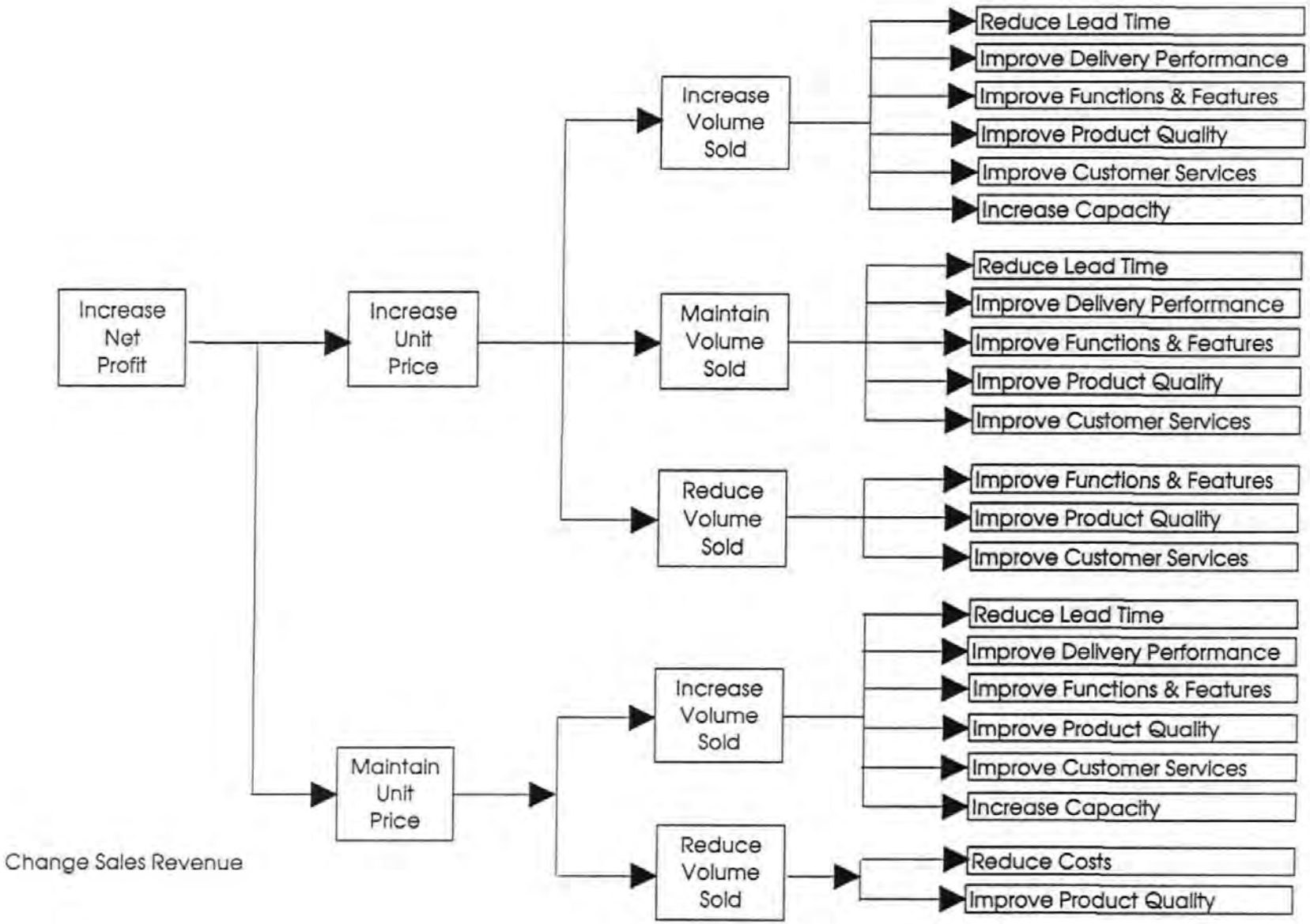
service can ensure customers remain loyal to the company and introduce other customers. This can have a knock on effect in reducing lead time, cost reduction and increased sales.

6. Improve Functionality and Features.

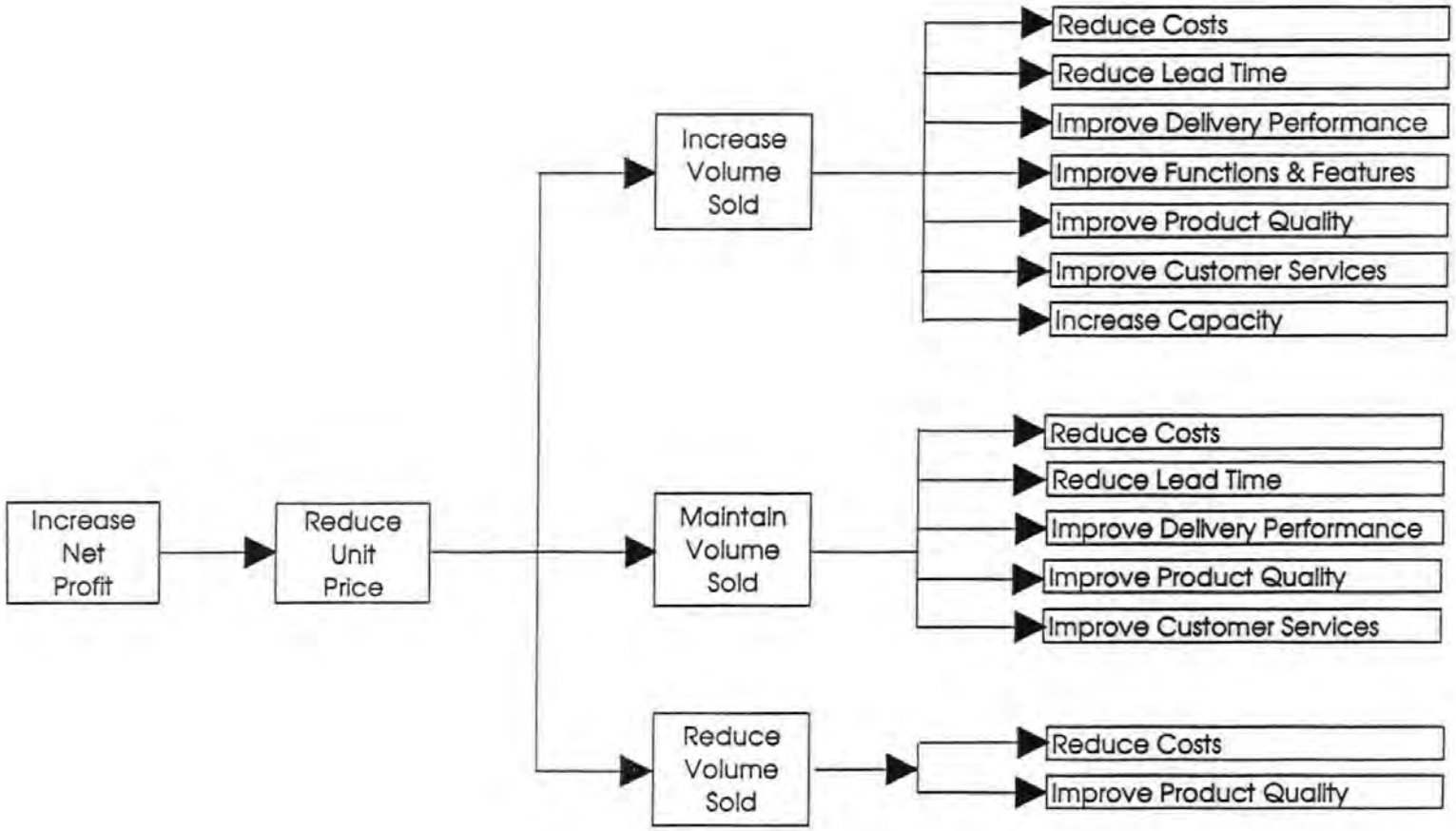
By offering the customer products that have improved functionality and features, a company could charge a higher unit price for its products, it could persuade a customer to buy the company's' product instead of those of a competitor. Improving functionality and features also incorporates the removal of unnecessary functions or features which require complicated operating instructions or specialist maintenance agreements.

7. Increase Capacity.

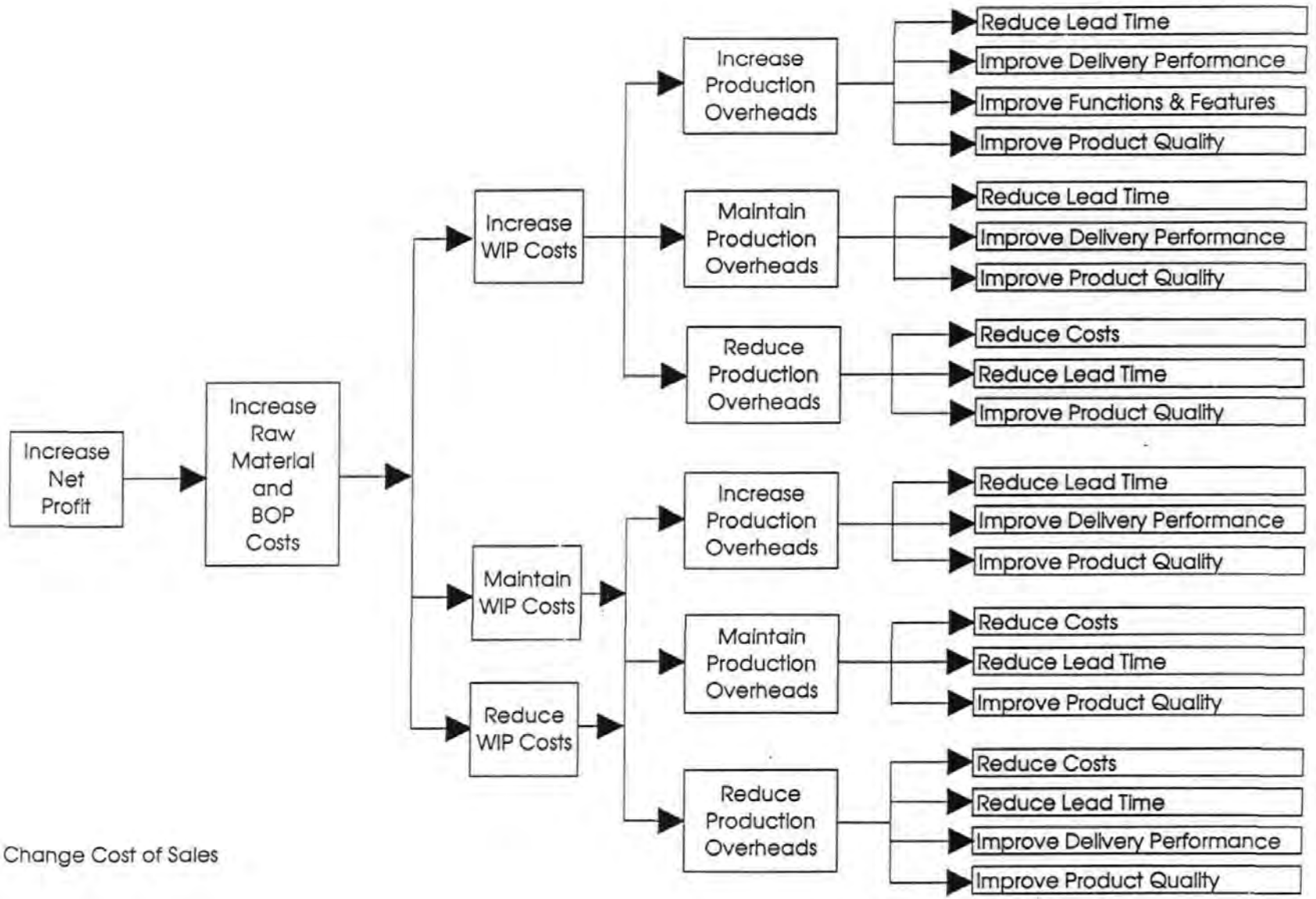
Increased capacity provides a business with the capability to compete in fluctuating markets without incurring large stock piles of inventory. It can also provide the opportunity to stop production to undertake maintenance, without jeopardising sales.



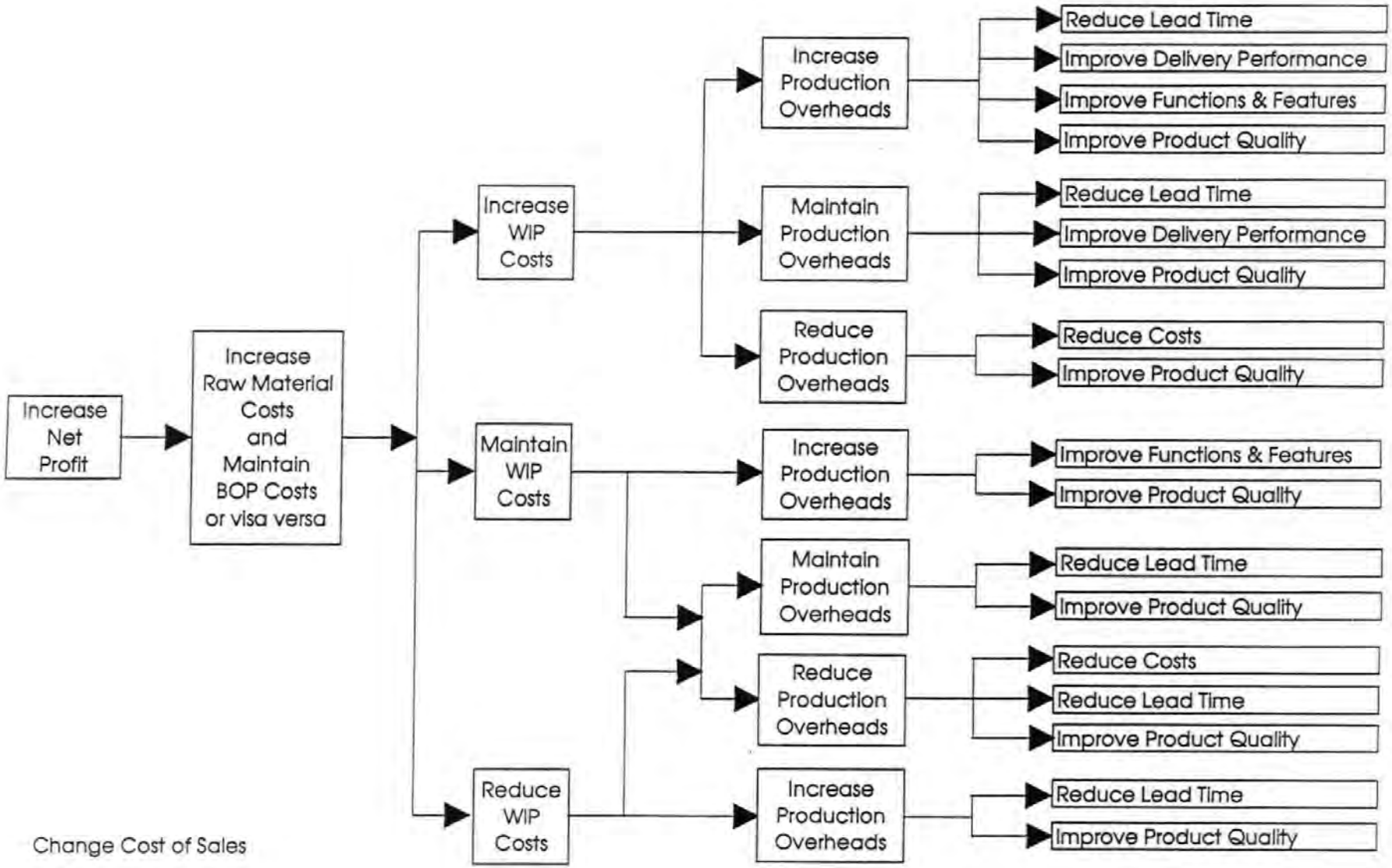
Change Sales Revenue

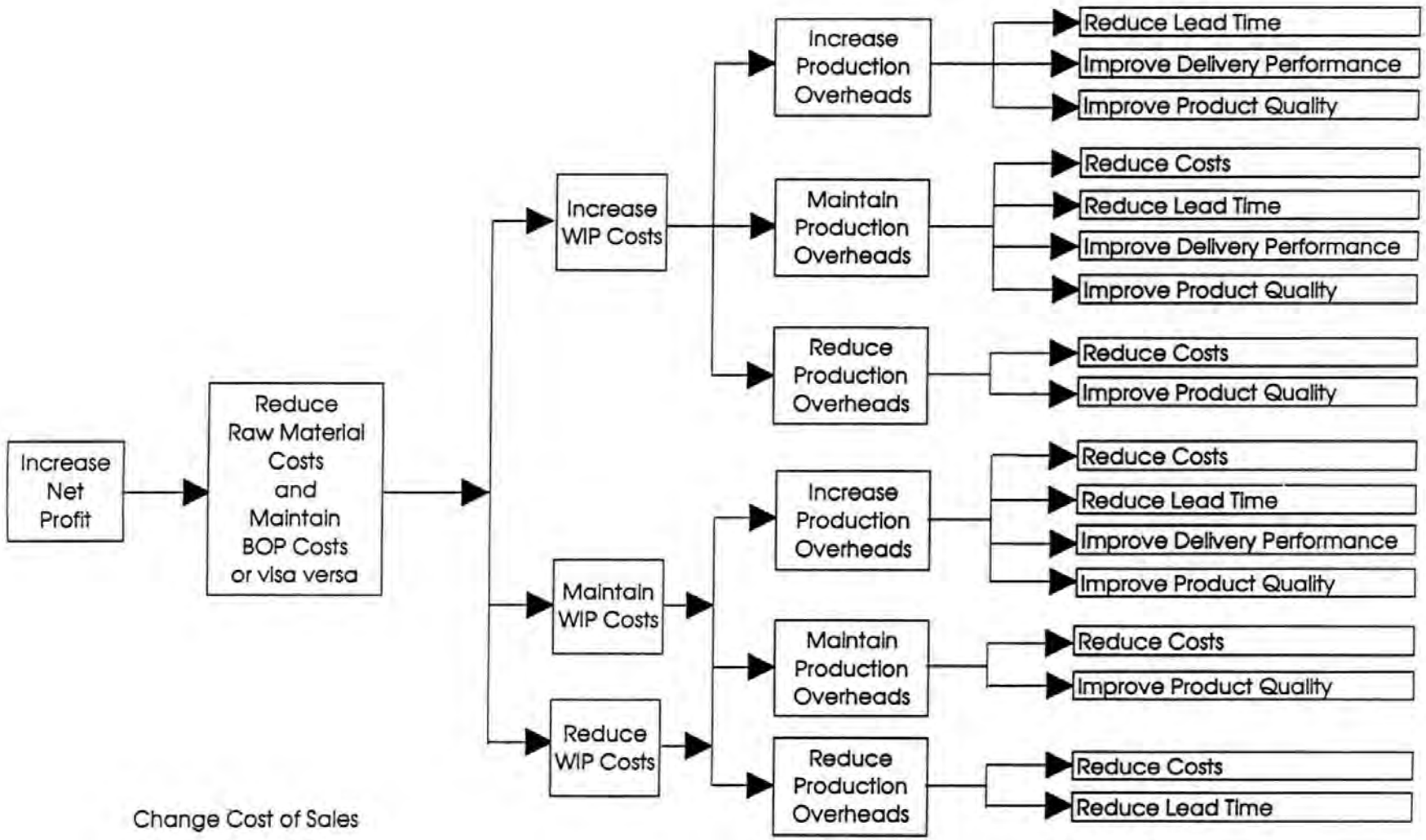


Change Sales Revenue

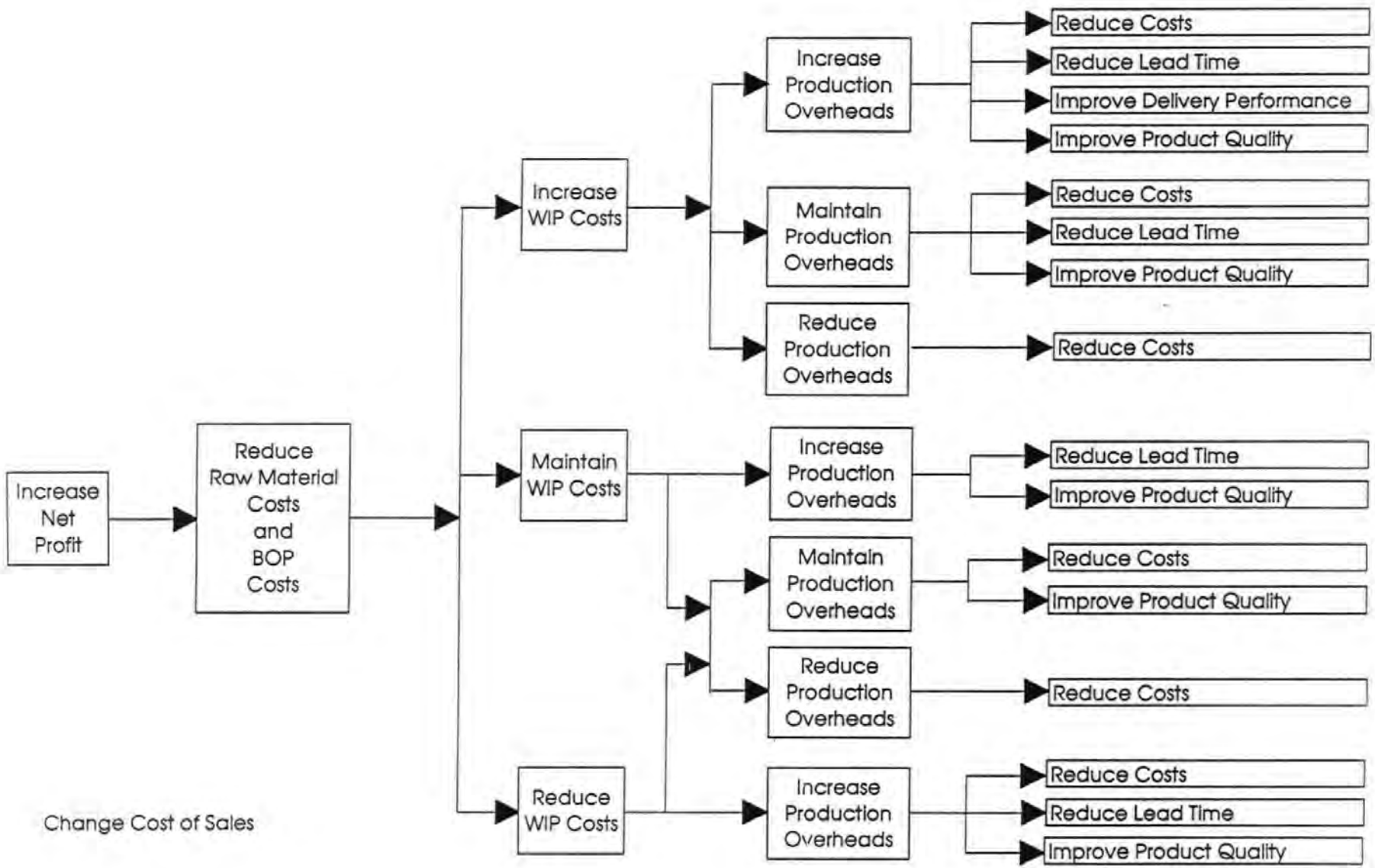


Change Cost of Sales

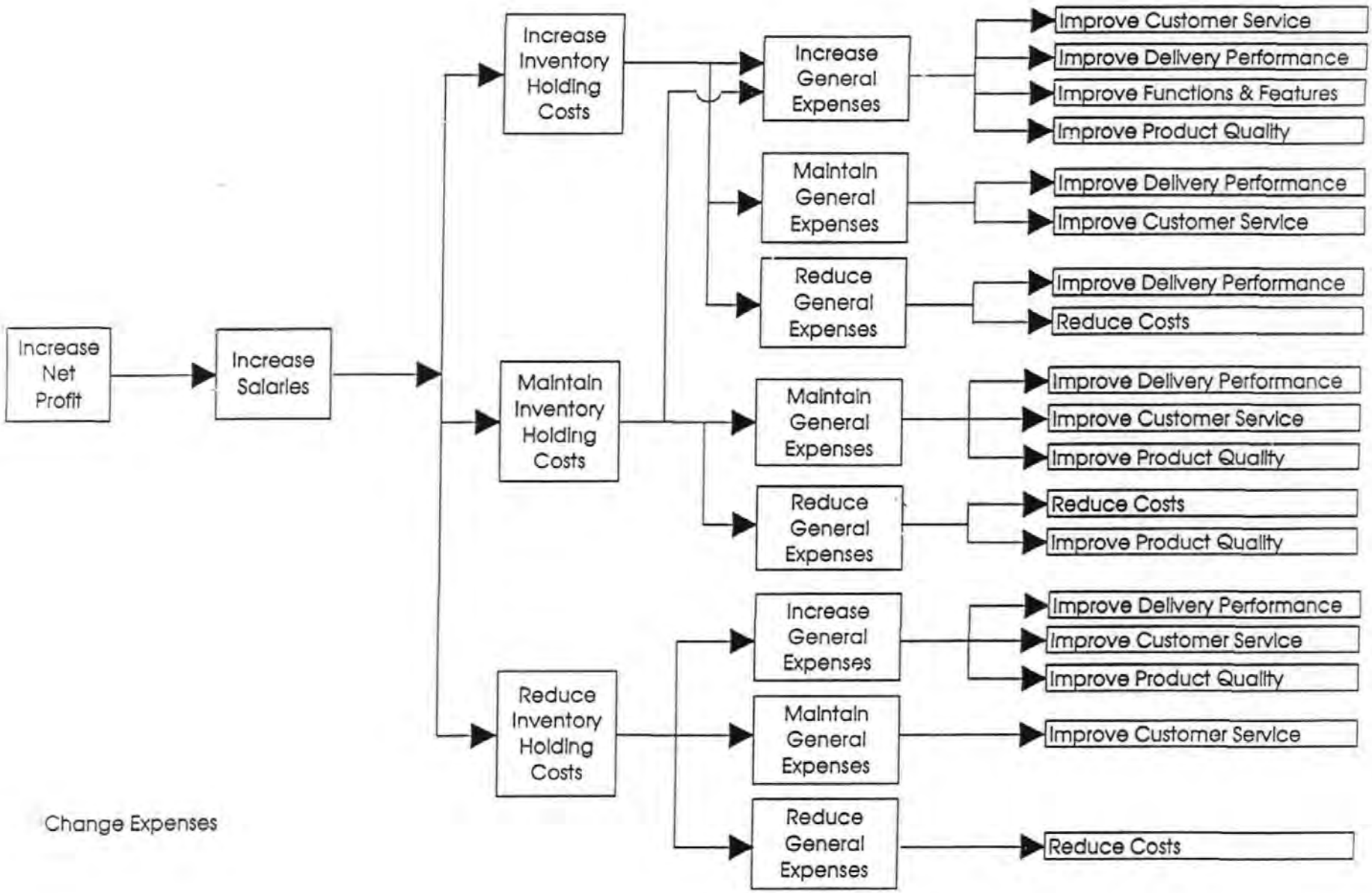

Increase Net Profit
Increase Raw Material Costs and Maintain BOP Costs or visa versa
Change Cost of Sales
Increase WIP Costs
Maintain WIP Costs
Reduce WIP Costs
Increase Production Overheads
Maintain Production Overheads
Reduce Production Overheads
Increase Production Overheads
Maintain Production Overheads
Reduce Production Overheads
Increase Production Overheads
Reduce Lead Time
Improve Delivery Performance
Improve Functions & Features
Improve Product Quality
Reduce Lead Time
Improve Delivery Performance
Improve Product Quality
Reduce Costs
Improve Product Quality
Improve Functions & Features
Improve Product Quality
Reduce Lead Time
Improve Product Quality
Reduce Costs
Reduce Lead Time
Improve Product Quality
Reduce Lead Time
Improve Product Quality



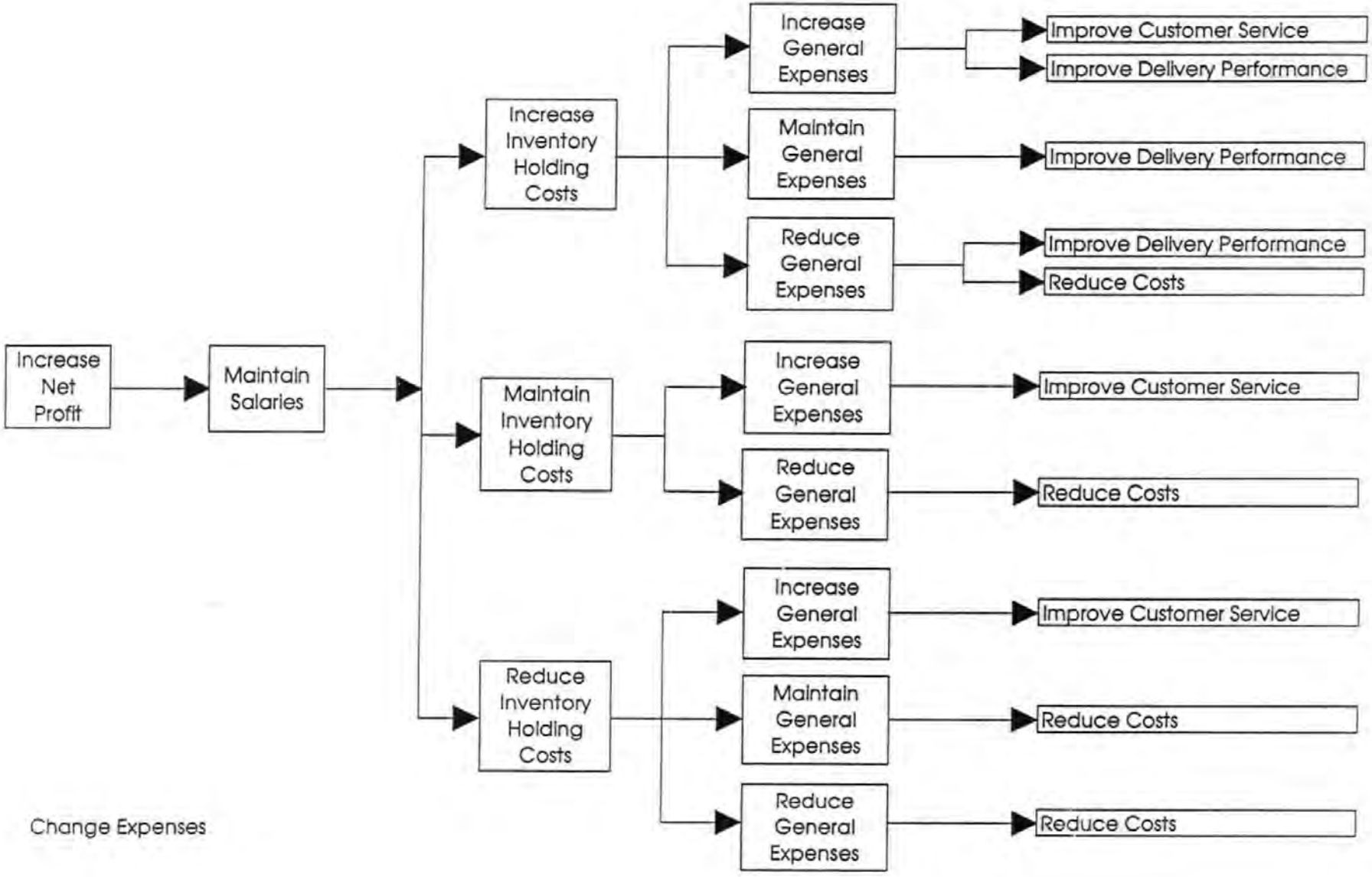
Change Cost of Sales



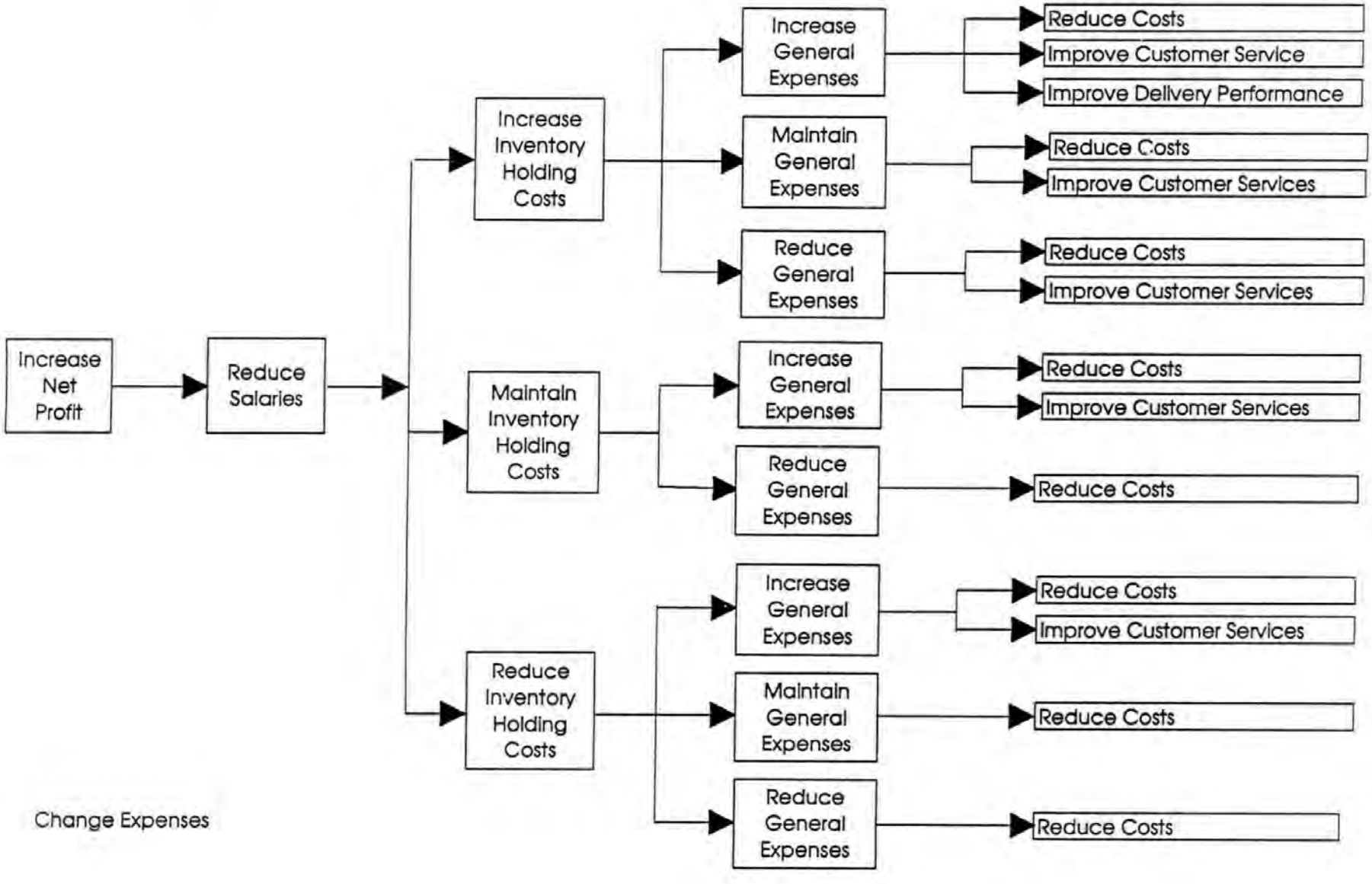
Change Cost of Sales



Change Expenses



Change Expenses



Change Expenses

PROFIT by P. Larsen

Deliverable 7 - Business Needs

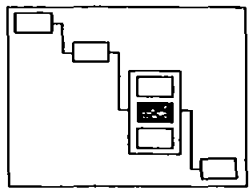
Business Needs:	1	2	3	4	5	6	Co. Wide
Reduce Costs							
Reduce Lead Time							
Improve Delivery							
Improve Product Quality							
Improve Customer Service							
Improve Functions & Features							
Increase Capacity							

Help Screen

Please tick a cell opposite business need for each Sales Product, or where business need is applicable on a Company Wide basis the Co. Wide cell.

Stage Three - Option Two Identify Investment(s)

Workshop 3.2



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Production and Sales.

Rationale:

Where a company has undertaken Option 1 - Identify Business Need(s), step one of Workshop 3.2 can be by-passed.

The first step of Workshop 3.2 begins by selecting a Business Need from the list below. If advice is required, Tool Kit 3.1, provides explanations for each of the business needs.

Business Needs fall into the following:

1. *Reduce Costs.*
2. *Reduce Lead Time.*
3. *Improve Delivery Performance.*
4. *Improve Product Quality.*
5. *Improve Customer Service.*
6. *Improve Functionality and Features.*
7. *Increase Capacity.*

Once agreement has been reached, Deliverable 7 can be completed.

Step two involves identifying the potential for change within the Company. The potential for change questions identify which areas within a company can be changed and, therefore, reduces the number of possible investments. Toolkit 3.2.1 provides assistance.

After completion of Deliverable 8 - Agreed Change Potential, the Steering Committee is ready to progress to the third step. By comparing the Business Need

with the Potential for Change, identification of investments is possible using Toolkit 3.2.2. In the CBT investments are automatically recommended.

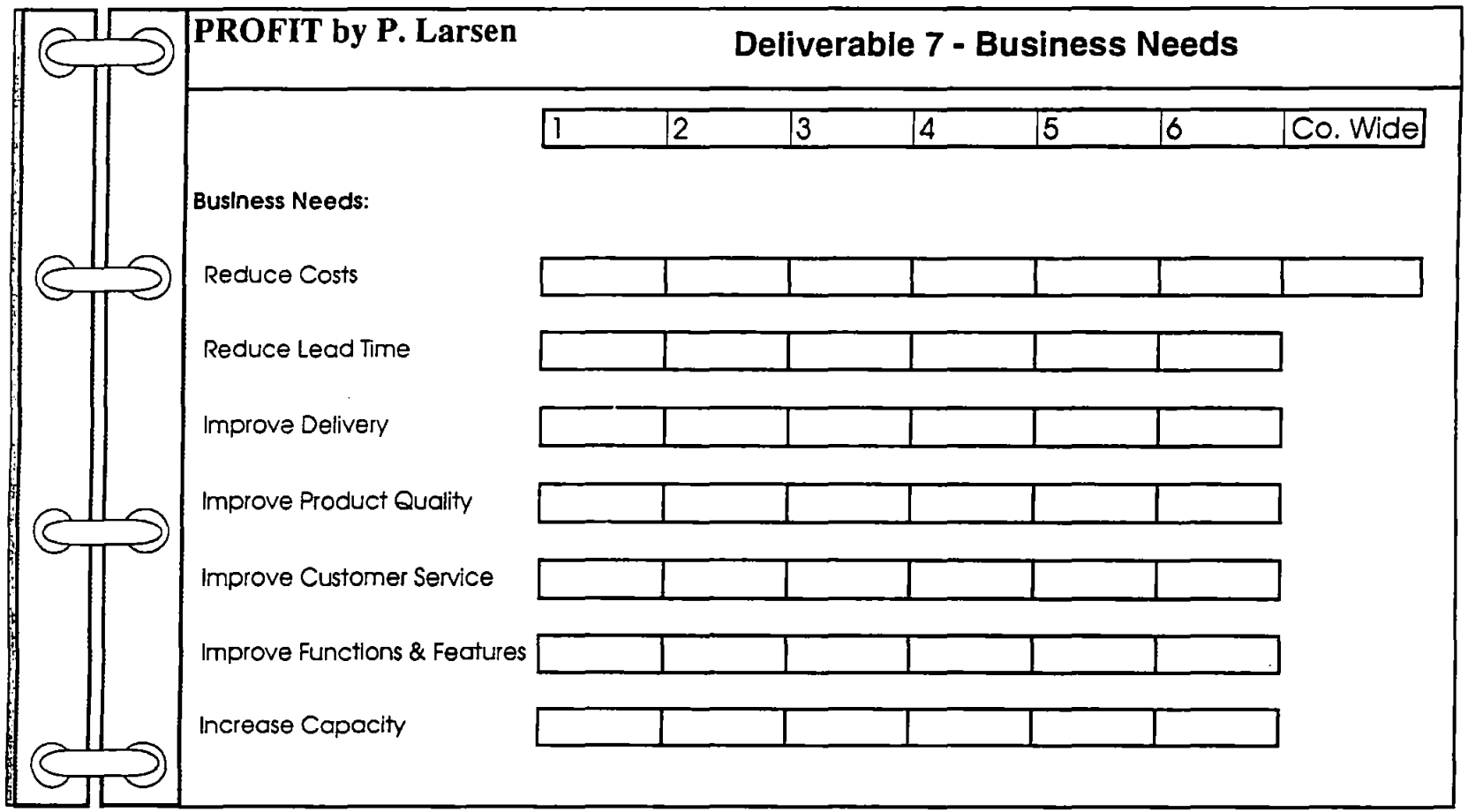
A short description of all the Investments covered by PROFIT are available in Toolkit 3.2.3. Having selected an investment, Deliverable 9 - Agreed Investment is completed. Pro-forma 10 -List of Benefits and Pro-forma 11 List of Costs are completed, with the aid of Toolkit 3.2.4.

The Workshop concludes with copies of the benefits on Pro-forma 10 being sent out to those responsible for the processes where the benefits will be seen, so that they can calculate the value of the benefits using Deliverable 13 in Workshop 4.

The details of the investment are also sent out to possible vendors on Pro-forma 11 to obtain quotes regarding costs and time periods involved in any implementation, for discussion in Workshop 4. The information from the vendors is entered on Deliverable 14 and should include the cost of the investment, the investment period and interest rate applicable.

Actions Required:

Tasks:
Select business needs.
Identify potential for change.
Compare business needs with potential for change.
Identify possible investments.
Select investment.
Complete:
Deliverable 7 - Agreed Business Need(s).
Deliverable 8 - Agreed Change Potential.
Deliverable 9 - Agreed Investment.
Deliverable 10 - List of Benefits.
Deliverable 11 - List of Costs.
Send Out:
Pro-forma 13 - Benefits of Investment.
Pro-forma 14 - Costs of Investment.



Help Screen

Please tick a cell opposite business need for each Sales Product, or where business need is applicable on a Company Wide basis the Co. Wide cell.

Toolkit 3.2.1.

Potential for Change.

The Potential for Change is necessary because it reduces the number of investments applicable for the business needs identified. This is achieved by questioning the capability of a company to change the processes within the company.

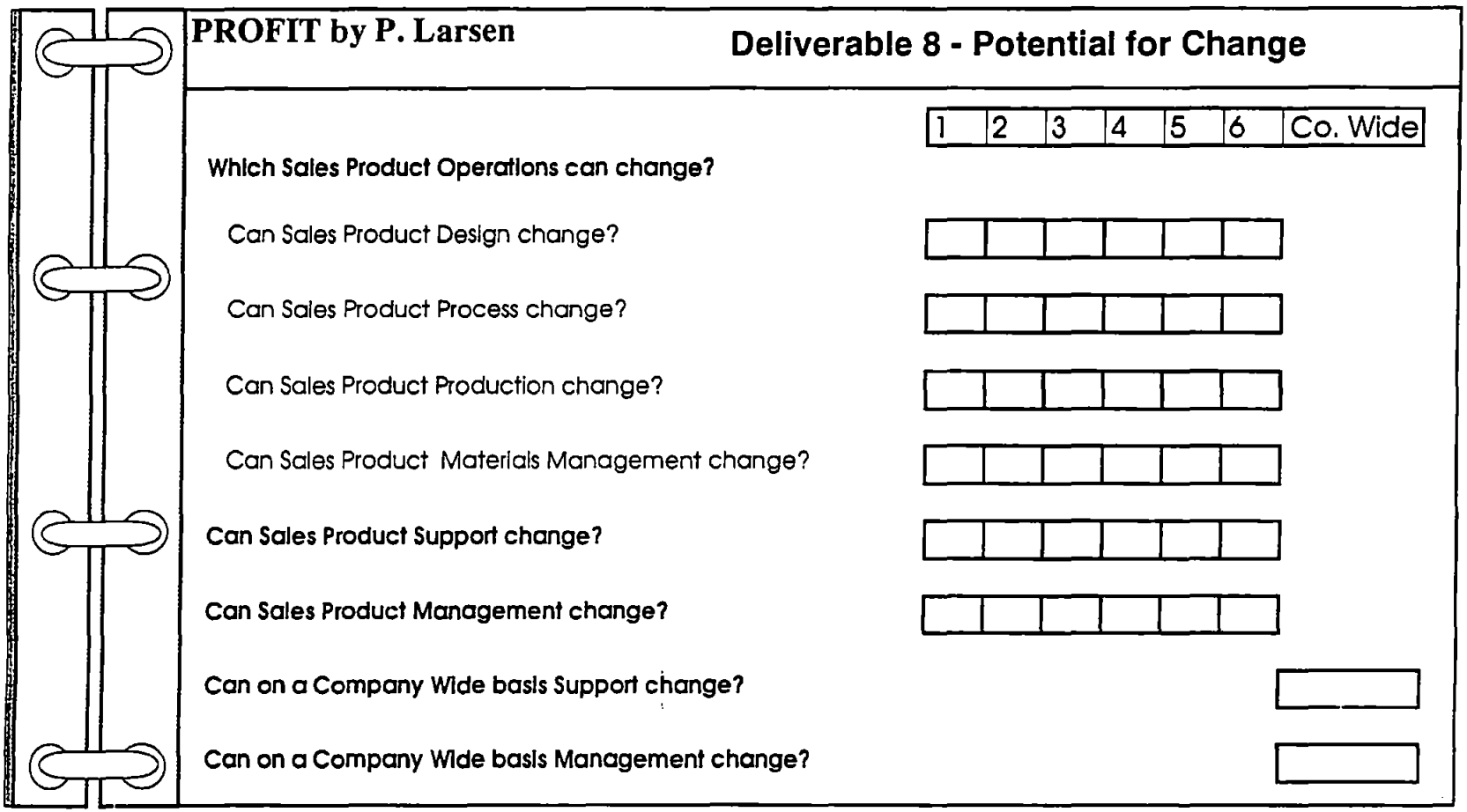
The number of questions have been simplified in line with part of the Computer Integrated Manufacturing Open Systems Architecture (CIM OSA) concept, whereby the processes within a company can be broken down into three main areas of:

Operations.
Support.
Management.

This helps to overcome any resentment that might occur when individual departments or functional areas within a company are audited.

For example:

> If the potential for change question was, "Can the Product Design Process be changed?" Then if the answer were "Yes", Computer Aided Design (CAD) could be a possibility. However, if the answer were to be "No", there would be little point in recommending CAD.



Help Screen

Please tick a cell opposite potential for change questions for each Sales Product, or where business need is applicable on a Company Wide basis the Co. Wide cell.

Toolkit 3.2.2.

Identify Possible Investments, Develop Investment Tracks, Challenge Investment Tracks and Agree Investment.

Identify Possible Investments.

Depending on whether the potential for change is Sales Product specific or Company Wide, as selected on Deliverable 8, and which Business Need is applicable, as in Deliverable 7, possible investments can be identified using Toolkit 3.2.3 Rules. A short description of the Investments are also available in Toolkit 3.2.3. The CBT generates the investment and description information automatically. The Workbook method requires checking the lists in Toolkit 3.2.3 Rules and Description.

An investment for business need 'Improve Quality' and change potential 'change Process Design' will not necessarily provide the same answers as business need 'Reduce Costs' and change potential 'change Process Design'.

Develop Investment Tracks.

Having selected possible investments, the PROFIT Steering Committee must discuss the most appropriate investment for their company's requirements. To ensure ownership and commitment, to the final selected investment, are maintained, Investment Tracks are developed.

An Investment Track amalgamates specific sales product based investments into a set of investments appropriate for the complete manufacturing environment, its associated control systems and human resources. This amalgamation is necessary for two reasons.

1. Because certain investments might not be justified on the basis of their affect on one sales product alone, but may be worthwhile as part of an improvement affecting many sales products.

2. By amalgamating individual investments an overall investment might be identified which makes better use of the available resources.

Based on the investments identified in Toolkit 3.2.3, each member of the PROFIT Steering Committee is invited in turn to describe the rationale underlying the decision to amalgamate particular investments. Members then comment on the Investment Tracks identified and consider the effect and relationship to other investment tracks suggested. The process continues until a consensus is achieved on which Investments Tracks to consider for the Challenge Investment Tracks.

Challenge Investment Tracks.

Challenge Investment Tracks is the process of rigorously assessing individual investments and investment tracks to eliminate conflicts and ensure that investments are effective and feasible.

Challenging investments is essential for two reasons.

1. The process of amalgamating investments to develop the tracks may in itself have brought into question the Company's capacity to implement them.

2. Both individual investments and investment tracks need to be re-examined to eliminate or reconcile conflicts, avoid duplication and provide a realistic and achievable programme for improvement.

The result of Challenging Investment Tracks is to agree an Investment or a set of Investments which the Steering Committee own and commit to.

Agree Investment.

When agreement has been reached, the Steering Committee complete Deliverable 9 - Agree investment. They then copy from the Workbook or print off from the CBT, the list of benefits applicable for the investment using Deliverable 10. The full list of benefits are detailed in Toolkit 3.2.4.

Toolkit 3.2.3.

Rules.

The Business Need and Sales Product or Company Wide Potential for Change to Investment link is offered by the Rules 1 to 34 overleaf.

Descriptions.

The descriptions of the Investments, suggested by the Rules 1 to 34, have been deliberately kept brief. This enables the Investments to be viewed in their broadest sense. The user is advised to obtain more detailed descriptions from vendors, suppliers, software and hardware houses, possibly when sending out Pro-forma 13 and 14, Value of Benefits and Value of Costs respectively.

Rules

RULE 1.
IF Business Need = Reduce Costs
AND IF Sales Product DESIGN can change
THEN the following Investments exist:

- CAD
- Packaging Redesign
- DFA
- DFM
- DFT
- Parts Database

RULE 2.
IF Business Need = Reduce Costs
AND IF Sales Product PROCESS can change
THEN the following Investments exist:

- Change Process
- Process Simplification
- CAPP

RULE 3.
IF Business Need = Reduce Costs
AND IF Sales Product PRODUCTION can change
THEN the following Investments exist:

- Additional Machine
- Labour - Machining:
  - Flexible Manufacturing System
  - Group Technology
  - CNC
  - DNC
  - Turning/Machining Centres
  - Minimise Set Up Time
  - Pre-Set Tooling
  - Operator Inspection
  - Automatic Tool Change
  - Operator Training for Multi-tasking/skill
- Labour - Assembly:
  - Flexible Assembly System
  - Minimise Set Up Time
  - Pre-Set Tooling
  - Auto Insertion
  - Operator Training
  - Automated Guided Vehicles (AGVs)
  - Robots
  - Dedicated Assembly Machines

RULE 3 (continued).

Production:

Job Enrichment - Operator Responsibility
Inspection and Test:
Operator Inspection Scheme
Continuous Improvement Monitoring
Statistical Process Control SPC
Total quality Management TQM
Quality Circles
Corrective Action Teams (CAT)
Automatic Test Equipment (ATE)
Co-Ordinate Measuring Machines

RULE 4.

IF Business Need = Reduce Costs
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN the following Investments exist:

Raw Materials and Bought Out Parts:

Vendor Rating Management
Open Orders
Supplier Contract Re negotiation
Reduce Scrap
Electronic Data Interchange (EDI)
Procurement Engineering (Parts Only)

Inventory Management:

Automatic Warehousing, Storage and Retrieval System

RULE 5.

IF Business Need = Reduce Costs
AND IF Sales Product SUPPORT can change
THEN the following Investments exist:

Facilities:

Sales Order Processing
Change Packing
Automatic Packaging
Re-negotiate Delivery/Supplier Contracts

RULE 6.

IF Business Need = Reduce Costs
AND IF Sales Product MANAGEMENT can change
THEN the following Investments exist:

Production Overheads and Scheduling:

Factory Management System
Energy Management
Minimise Factory Layout
Production Control System
Pre-Planned Maintenance
Materials Requirement Planning (MRP)
Manufacturing Resource Requirements Planning (MRPII)
Computer Aided Production Management (CAPM)

RULE 7.
IF Business Need = Reduce Costs
AND IF on a Company Wide Basis SUPPORT can change
THEN the following Investments exist:
Facilities:
Desk Top Publishing System (DTP)
On-Line Access to Operations
Electronic Data Interchange (EDI)

RULE 8.
IF Business Need = Reduce Costs
AND IF on a Company Wide Basis MANAGEMENT can change
THEN the following Investments exist:
Company Wide Overheads:
Management Information System
Electronic Data Interchange (EDI)
Business Process Simplification

RULE 9.
IF Business Need = Reduce Lead Time
AND IF Sales Product DESIGN can change
THEN the following Investments exist:
Design and Customisation:
Computer Aided Design (CAD)
Design For Assembly (DFA)
Design For Manufacture (DFM)
Parts Database

RULE 10.
IF Business Need = Reduce Lead Time
AND IF Sales Product PROCESS can change
THEN the following Investments exist:
Change Process
Process Simplification

RULE 11.
IF Business Need = Reduce Lead Time
AND IF Sales Product PRODUCTION can change
THEN the following Investments exist:
Additional Machine
Labour - Set Up and Machining:
Cell Manufacturing
Group Technology
Dedicated Machines
Pre-Set Tooling
Minimise Set Up Times

RULE 11 (continued).

Labour - Assembly:

Flexible Automated assembly System
Auto Insertion
Dedicated Assembly Machines
Automated Guided Vehicles (AGVs)

Production:

Trial kitting - Simulation

Inspection and Test:

Operator Inspection Scheme
Continuous Improvement Monitoring
Automatic Test Equipment (ATE)
Co-Ordinate Measuring machines
Design For Test (DFT)

RULE 12.

IF Business Need = Reduce Lead Time
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN the following Investments exist:

Raw Materials and bought Out Parts:

Vendor Rating Management
Open Orders
Electronic Data Interchange (EDI)

RULE 13.

IF Business Need = Reduce Lead Time
AND IF Sales Product SUPPORT can change
THEN the following Investments exist:

Facilities:

Sales Order Processing
Electronic Data Interchange (EDI)
Standardised Products

Estimating and Costing:

Computer Supported Estimating and Costing
Activity Based Costing (ABC)
Vendor Rating Management

RULE 14.

IF Business Need = Reduce Lead Time
AND IF Sales Product MANAGEMENT can change
THEN the following Investments exist:

Production Overheads and scheduling:

Accurate Shop Floor Production Data collection
Kanban
Just In Time (JIT)
Optimised Production Technology (OPT)
Materials Requirement Planning (MRP)
Manufacturing Resource Requirements Planning (MRPII)
Computer Aided Process Planning (CAPP)
Computer Aided Production Management (CAPM)

RULE 15.
IF Business Need = Improve Delivery Performance
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN the following Investments exist:
Purchasing:
Vendor Rating Management

RULE 16.
IF Business Need = Improve Delivery Performance
AND IF Sales Product PRODUCTION can change
THEN the following Investments exist:
Production:
Additional Machine
Trial Kitting
Automated Guided Vehicles (AGVs)
Machining:
Preventative Maintenance

RULE 17.
IF Business Need = Improve Delivery Performance
AND IF Sales Product SUPPORT can change
THEN the following Investments exist:
Marketing and Sales Order Processing:
Accurate Capacity Data
Accurate Delivery Time Data
Estimating and Costing:
Production Control system

RULE 18.
IF Business Need = Improve Delivery Performance
AND IF Sales Product MANAGEMENT can change
THEN the following Investments exist:
Production Overheads and Scheduling:
Accurate Shop Floor Production Data

RULE 19.
IF Business Need = Improve Product Quality
AND IF Sales Product DESIGN can change
THEN the following Investments exist:
Design and Customisation:
Computer Aided Design (CAD)
Computer Aided Design Computer Aided Manufacturing (CADCAM)
Design For Assembly (DFA)
Design For Manufacture (DFM)
Standardise Parts
Change Materials
BS5700/ISO 9000

RULE 20.
IF Business Need = Improve Product Quality
AND IF Sales Product PROCESS can change
THEN the following Investments exist:
Process Simplification

RULE 21.
IF Business Need = Improve Product Quality
AND IF Sales Product PRODUCTION can change
THEN the following Investments exist:
Machining and Assembly:
Computer Numerical Control (CNC)
Distributed Numerical Control (DNC)
Dedicated Machines
Automatic Tool Changes
Yoki Poki
Inspection and Test:
Statistical Process Control (SPC)
Total Quality Management (TQM)
Quality Circles (QC)
Computer Aided Testing (CAT)
Operator Inspection Scheme
Continuous Improvement Monitoring
Co-Ordinate Measuring Machines
Pre-Planned Maintenance
Condition Based monitoring

RULE 22.
IF Business Need = Improve Product Quality
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN the following Investments exist:
Raw Materials and Bought Out parts:
Vendor Rating Management
Reduce Scrap
Procurement Engineering (Parts Only)
Standardised Material Sizes (Raw Materials Only)

RULE 23.
IF Business Need = Improve Product Quality
AND IF Sales Product SUPPORT can change
THEN the following Investments exist:
Marketing and Sales:
Formal Agreement of Requirements
Packaging and Delivery:
Redesign Packaging Materials
Redesign Packaging Methods

RULE 24.
IF Business Need = Improve Product Quality
AND IF Sales Product MANAGEMENT can change
THEN the following Investments exist:
Production Overheads and Scheduling:
Accurate Shop Floor Production Data Collection
Total Quality Management (TQM)

RULE 25.
IF Business Need = Improve Customer Service
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN the following Investments exist:
Inventory:
Inventory management
JIT
Kanban

RULE 26.
IF Business Need = Improve Customer Service
AND IF Sales Product SUPPORT can change
THEN the following Investments exist:
Local Distribution:
Training
After Sales Service:
On-Site Support Training
Hotline Support Training
Installation and commissioning Training
Warranty and Guarantee

RULE 27.
IF Business Need = Improve Customer Service
AND IF Sales Product MANAGEMENT can change
THEN the following Investments exist:
Total Quality Management (TQM)

RULE 28.
IF Business Need = Improve Functionality and Features
AND IF Sales Product DESIGN can change
THEN the following Investments exist:
Research and Development:
Computer Aided Design (CAD)
Design For Assembly (DFA)
Design For Manufacture (DFM)
Design:
Computer Aided Design (CAD)
Design For Assembly (DFA)
Design For Manufacture (DFM)
Modular Design

RULE 29.
IF Business Need = Improve Capacity
AND IF Sales Product DESIGN can change
THEN the following Investments exist:
Computer Aided Design (CAD)
Design For Assembly (DFA)
Design For Manufacture (DFM)

RULE 30.
IF Business Need = Improve Capacity
AND IF Sales Product PROCESS can change
THEN the following Investments exist:
Change Process
Process Simplification
Computer Aided Process Planning (CAPP)

RULE 31.
IF Business Need = Improve Capacity
AND IF Sales Product PRODUCTION can change
THEN the following Investments exist:
Additional Machine
Machining:
Flexible Manufacturing System
Computer Numerical Control (CNC)
Distributed Numerical Control (DNC)
Turning/Machining Centres
Minimise set Up Times
Assembly:
Flexible Assembly System
Robots
Automated Guided Vehicles (AGVs)
Inspection and Test:
Operator Inspection Scheme
Automatic Test equipment (ATE)

RULE 32.
IF Business Need = Improve Capacity
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN the following Investments exist:
Raw Materials and Bought Out Parts:
Suppiier Contract Re negotiation
Procurement Engineering (Parts Only)
Inventory Management:
Automatic Warehousing, Storage and Retrieval System

RULE 33.
IF Business Need = Improve Capacity
AND IF Sales Product SUPPORT can change
THEN the following Investments exist:
Change Packaging

RULE 34.
IF Business Need = Improve Capacity
AND IF Sales Product MANAGEMENT can change
THEN the following Investments exist:
Factory Scheduling System

Descriptions

Description of Investments.

Computer Aided Design (CAD)
Description:
A computer based design drawing tool. Provides drawings in two and/or three dimensions. Some systems capable of performing simulation. On-line access to engineering, production and manufacturing data.

Packaging Redesign
Description:
Design of packaging to reduce amount of packaging materials used or their costs. Reduce space used by finished goods awaiting dispatch.

Design For Assembly (DFA)
Description:
Designing products so that assembly constraints are reduced to a minimum or overcome completely.

Design For Manufacture (DFM)
Description:
Designing products so that manufacturing constraints are reduced to a minimum or overcome completely.

Design For Test (DFT)
Description:
Design to eliminate or reduce cost of testing products prior to dispatch to customers.

Parts Database
Description:
Computerised filing cabinet storing details of parts available to Design. Eliminate or reduce costs through access to on-line real time data on prices and capabilities, lead time, stock levels, etc..

Change Process
Description:
Alteration of assembly or manufacturing process to reduce costs.

Process Simplification.

Description:

Simplification of processes involved in the production of the product family. Identification of costly and/or time consuming activities that add cost but not value.

Additional Machine (Assembly or Manufacturing)

Description:

A machine which is the same as that already used in the assembly and/or manufacture of parts/products.

Flexible Manufacturing System

Description:

A group of automated machines capable of processing a variety of products through different process routes under full computer control.

Group Technology

Description:

Group Technology involves classifying or coding parts into groups. The groups can represent similar shapes, lengths, processes, materials etc.

Computer Numerical Control (CNC)

Description:

In CNC the hard wired logic in NC units is replaced by a programmable computer, enabling a number of different programs to be stored in the computers memory and selected as required. CNC units also offer self-diagnosis capabilities, such as, last maintenance, stoppage problems, lubrication requirements, etc..

Distributed Numerical Control (DNC)

Description

Distributed Numerical Control applies in cases where there are a number of machine tools and/or CNC's covered by a host computer serving a network. With CNC each machine can operate different programs independently, preventing total stoppage in case of one breakdown.

Turning/Machining Centres

Description:

Machining Centres are highly accurate, multi-axis, multi-function machines capable of milling, drilling, boring prismatic parts. Can be controlled by CNC.

Minimise Assembly and Production Set Up Times

Description:

The set up time is the time taken in changing machine tools. Set up time is measured by recording the time taken from the time the last good part was produced with the old tool to the time the first good part is produced with the new tool.

Pre Set Tooling

Description:

Pre set tooling involves pre setting tool turrets with the required tools for the production, providing faster changeover times. Particularly applicable in cases where similar products are grouped together.

Automatic Tool Change

Description:

Use of computer program to facilitate quick changeover of machine tools.

Operator Training for Multi-tasking/skill

Description:

Training of operators to increase their range of tasks/skilled operations that they can perform.

Flexible Assembly System

Description:

A group of automated assembly machines capable of processing a variety of products through different process routes under full computer control.

Auto Insertion

Description:

The automated insertion of parts into an assembly.

Operator Training

Description:

The training of operators to improve their performance/skills.

Robots

Description:

An assembly robot is an automated position-controlled re programmable, multi-functional machine capable of handling parts, materials, tools or specialised devices through variable programmed motions for the performance of a number of tasks, without requiring modification to the physical structure of the machine.

Dedicated Assembly Machines

Description:

A machine used for the assembly of a specific product or product family.

Job Enrichment - Operator Responsibility

Description:

Improving the job satisfaction of production operators through 'ownership' of the production process(s) they are responsible for.

Automated Guided Vehicles (AGV's)

Description:

A transport system that follows a wire set on to the floor of a plant or some other form of guidance (fixed or unfixed), controlled by computer program, for the distribution of parts, tools and materials between machines. They can also be used as mobile work stations in assembly.

Operator Inspection Scheme

Description:

Encourages the operator to be responsible for the quality of the products produced on the machines he /she is in charge of

Continuous Improvement Monitoring

Description:

Continuous improvement monitoring requires processes, people and methods be constantly evaluated to ensure a continual move towards improved quality is achieved.

Statistical Process Control (SPC)

Description:

A method for identifying processes that run out of control. SPC enables inspection and test personnel to isolate the parameters of processes that are critical in determining process variance, establish values of those parameters consistent with the variability requirements and then to develop standard means of monitoring the processes through their critical parameters.

Total Quality Management (TQM)

Description:

Improving quality throughout the company, for the products, the processes and the people. Involves a top down approach.

Quality Circles (QC)

Description:

A group of operators and production personnel who meet to discuss quality improvement for their specific area.

Corrective Action Teams (CAT)

Description:

A team of production personnel who have responsibility for correcting or repairing faulty machines and equipment where processes are running out of control or machines breakdown.

Automatic Test Equipment (ATE)

Description:

Equipment that can carry out checks automatically for functionality, performance, conformance and quality on manufactured and assembled parts or products in real time.

Co-Ordinate Measuring Machines

Description:

Machines capable of carrying out a variety of inspection processes utilising positional information to check the accuracy of the part or products' dimensions. Usually associated with the inspection of machine parts.

Vendor Rating Management

Description:

Rating of suppliers based on their ability to deliver to schedule, quality of parts/materials, batch size, economic order quantity, etc.

Open Orders

Description:

Ability to order/cancel as and when parts and/or materials are required and not based on a fixed contractual supply rate or to incur penalties for cancellations.

Reduce Scrap

Description:

Improve material and or part quality and or processes to reduce waste.

Electronic Data Interchange (EDI)

Description:

Communication of data between people, departments, companies via electronic devices, i.e. computer networks linked to computer terminals.

Procurement Engineering (Parts Only)

Description:

A co-operative arrangement between a company and a supplier of bought out parts, where information and expertise are exchanged in order to improve the purchasing specification or requirements of the company.

Automated Warehousing, Storage and Retrieval System

Description:

A warehouse operated entirely under computer control. Capable of storing and retrieving goods, keeping track of what is used and the inventory levels of each part, material, sub-assembly, etc.

Sales Order Processing System

Description:

Methodology, system or software for improving efficiency of Sales Order Processing.

Change Packaging

Description:

Redesign of packaging to use alternative materials and/or to standardise.

Automatic Packaging

Description:

Machines capable of packing products without human intervention.

Re-negotiate Supplier/Delivery Contracts

Description:

Re-negotiate supplier and or delivery contracts to improve delivery structure.

Factory Management Systems

Description:

A system that assists management in the control of the factory.

Energy Management

Description:

Management of energy consumed by company to ensure its efficient use and thereby, reduce costs.

Minimise Factory Layout

Description:

Minimisation of floor spare utilised by production.

Production Control System

Description:

A system which aids control of the production plan and scheduling manufacturing resources.

Pre-Planned Maintenance

Description:

Planning of machine and equipment maintenance to coincide with natural production breaks, low production, holidays, etc.

Materials Requirements Planning (MRP)

Description:

The planning of component and material requirements in order to meet daily production schedules without holding high inventory.

Manufacturing Resource Planning (MRPII)

Description:

The planning of component, material, resource and capacity requirements necessary to meet production.

Computer Aided Production Management (CAPM)

Description:

Computer tool that aids management in deciding on the company's operating and production plan.

Desk Top Publishing System (DTP)

Description:

Computer system for the production of Sales brochures, leaflets, posters, etc., handbooks and manuals, company reports, etc.

On-Line Access to Operations

Description:

On line access to Design, Production and Materials Management.

Management Information System

Description:

Computer software and hardware that assists management in the control of the company.

Business Process Simplification

Description:

Simplification of business processes involved throughout the company. Identification of costly and/or time consuming activities that add cost but not value.

Cell Manufacturing

Description:

A group of machines placed together or in 'cells', capable of processing a variety of products.

Trial Kitting - Simulation

Description:

Testing by simulation, usually on a computer of the production process. Commonly used where products consist of a number of sub-assemblies which are used across product groups.

Standardised Products

Description:

A database of standard components with associated manufacturing and design data which specifies which parts are approved for use.

Computer Supported Estimating and Costing

Description:

Computer supported process of assigning production costs and time scales to specific processes on the basis of their manufacturing resources.

Activity Based Costing (ABC)

Description:

Is the process of assigning production overhead costs to specific products based on cost centres and drivers.

Vendor Rating Management

Description:

The process of evaluating vendors on their ability to meet pre-determined criteria, such as quality levels, delivery lead times, after sales service, etc.

Accurate Shop floor Production Data Collection

Description:

Provides detailed data on the current status of manufacturing. As work is completed on one operation, the manufacturing control system is informed to immediately schedule the next operation or process.

Kanban

Description:

A technique which minimises inventory and WIP by ensuring processes 'pull' work from preceding operations. Work is not supplied until required, minimising WIP and providing greater manufacturing control.

Just In Time (JIT)

Description:

A technique which minimises inventory and WIP by ensuring processes 'pull' work from preceding operations. Work is not supplied until required, minimising WIP and providing greater manufacturing control.

Optimised Production Technology (OPT)

Description:

A manufacturing control strategy which seeks to use manufacturing resources efficiently by eliminating bottlenecks, which may be a particular machine tool, cell or process.

Computer Aided Process Planning (CAPP)

Description:

Automation of process planning for a product run, including tooling, set-up, personnel, layout, testing, etc.

Preventative Maintenance

Description:

Maintaining machines, so as to prevent or reduce unexpected breakdowns and stoppages.

Accurate Capacity Data

Description:

Provides detailed data on the current status of production. As work is completed on one operation, the production control system is informed to immediately schedule the next operation or process.

Accurate Delivery Time Data

Description:

Provides data on expected delivery times as orders are completed, improving customer service.

Production Control Data System

Description:

Provides detailed data on the current status of manufacturing. As work is completed on one operation, the manufacturing control system is informed to immediately schedule the next operation or process.

Computer Aided Design Computer Aided Manufacturing (CADCAM)

Description:

A computer based design drawing tool linked to a computer aided manufacturing machine. Provides drawing specifications to be downloaded direct to manufacturing machine eliminating risk of errors.

BS5750

Description:

BS5750 is the British Standard accreditation process organised by the British standards institute to recognise organisations which have attained certain standards for quality products, procedures and services.

ISO 9000

Is the internationally recognised standard for organisations which have attained certain standards for quality products, procedures and services.

Yoki Poki

Description:

Japanese technique for 'error proofing' processes. This means that considerable efforts are made to ensure the manufacturing process involved cannot fail or produce products not of the desired quality.

Condition Based Monitoring

Description:

Monitoring of processes dependent on the condition of the output.

Standardised Material Sizes (Raw Materials Only)

Description:

Redesign of products in co-operation with suppliers such that raw materials are purchased and used in standard batch sizes.

Formal Agreement of Requirements

Description:

Agreement between a company and its suppliers/customers to ensure quality, lead time, delivery reliability, customer service, price, volume, etc., requirements are met.

Redesign Packaging Materials

Description:

Redesign packaging materials to improve handling and readability, storage and transport. Reduce risk of damage to products.

Redesign Packaging Methods

Description:

Redesign method of production of packaging processes to improve handling, reduce damage, costs, quantity or size of packaging.

Inventory Management

Description:

Provides valuable support where bought out parts and raw materials are planned in order to meet challenging production requirements without the need for high inventory levels.

Training

Description:

Improving the skills of the employees resulting in greater product knowledge, supply and delivery data. Improved installation, operation and maintenance of product in house.

On-Site Support Training

Description:

Covers repair and maintenance of products, customer training and general advice on product installation, application, operation and maintenance.

Hotline Support Training

Description:

Covers provision of advice on products and services to the customer via telephone, fax, e-mail and electronic 'bulletin' boards.

Installation and Commissioning Training

Description:

Involves full product functionality test to be verified by customer. Improves customer confidence in supplier.

Warranty and Guarantee

Description:

Formal method to ensure customer is protected against breakdown or failure of product. Guarantees product quality for a limited period of time. Extension options at additional charge.

Modular Design

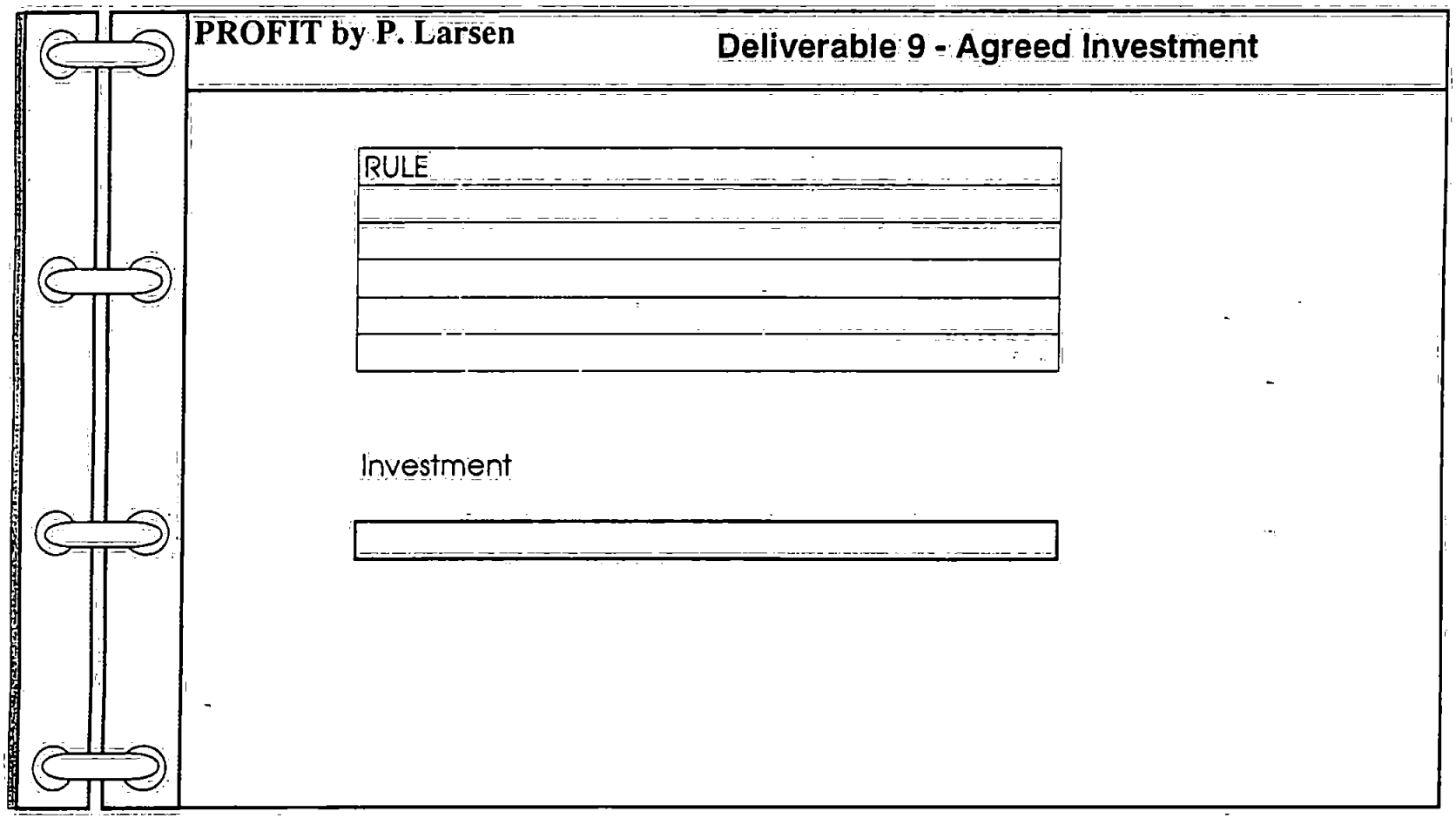
Description:

Designing products so as to enable their upgrading by replacing individual modules.

Factory Scheduling Systems

Description:

Linear programming systems that provide the user with varying scenarios to identify the best schedule for the factory.


PROFIT by P. Larsen
Deliverable 9 - Agreed Investment
RULE
Investment

Toolkit 3.2.4. Benefits

Print off or copy the benefits onto Deliverable 10 and the costs onto Deliverable 11 - List of costs..

Copies of the benefits (Deliverable 10) are sent out with Pro-forma 13, to those responsible for the processes where the benefits will be seen, so that they can calculate the value of the benefits for discussion in Workshop 4. The information from Pro-forma 13 will be used to complete Deliverable 13.

The details of the investment costs (Deliverable 11) are sent out with Pro-forma 14 to possible vendors to obtain quotes regarding costs and time periods involved in any implementation for discussion in Workshop 4. The information from the vendors is entered on Pro-forma 14 and should include the cost of the investment, the investment period and interest rate applicable.

Benefits of Investments. The benefits relate to the numbered rules in Toolkit 3.2.3. To avoid unnecessary repetition, the benefit **Increased Sales Revenue** should be considered applicable to all Rules.

RULE 1.
Benefits for Reduced Costs
Computer Aided Design (CAD)
Reduce the number of existing draughtsmen.
Avoid recruiting additional draughtsmen.
Avoid extending drawing office buildings.
Reduce clerical labour in drawing office.
Reduce or avoid subcontract design work.
Eliminate model making through 3-dimensional design.
Reduce outside graphic design work.
Improved drawings reduce production costs.
Reduced scrap and rework.
Eliminate 'stock outs'.
Component standardisation enables larger batch sizes to be produced.
Design optimisation reduces production and material costs.
Elimination of unprofitable orders by improved estimating.

Packaging Redesign
Reduced costs through reduced materials.
Use of alternative materials.
Optimisation of inventory space.

RULE 1 (Continued).
Benefits for Reduced Costs
Design For Assembly (DFA)
Reduced number of parts to manufacture, buy out and/or assemble.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Reduced assembly costs.
Reduce costs through change in materials.
Reduce costs through change in bought out parts.
Reduce costs through change in process.

Design For Manufacture (DFM)
Reduced number of parts to buy out and/or manufacture.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Reduced manufacturing costs.
Reduce costs through change in materials.
Reduce costs through change in bought out parts.
Reduce costs through change in process.

Design For Test (DFT)
Improved design reduces time spent testing products.
Reduced number of test personnel.
Avoid recruiting additional test personnel.

Parts Database
Reduce costs by selecting parts of known capabilities.
Eliminate ordering of unsuitable or costly parts.
Identify new cheaper parts capable of replacing existing parts.
Specify parts that company have high inventory of.
Component standardisation enables larger batch sizes to be produced.
Increased batch size, results in savings through economics of quantity.

RULE 2.
Benefits for Reduced Cost
Change Process
Less waste through use of alternative process.
Improved use of machinery and throughput of parts.
Reduced set up time.

Process Simplification.
Identification of high cost centres.
Improved material flow reducing WIP.
Improved throughput.

RULE 2 (Continued).
Benefits for Reduced Costs
Computer Aided Process Planning (CAPP)
Reduced time spent planning processes.
Reduce number of existing process planners.
Avoid recruiting additional process planners.
Improved throughput of materials, parts, etc.
Reduce WIP.
Improved accuracy of production forecasts preventing 'stock outs'.

RULE 3.
Benefits for Reduced Cost
Additional Machine
Improved throughput of parts.
Reduced set up time.
Reduced downtime.
Known capability.
Avoid retraining.
Avoid recruiting extra skilled operators.

LABOUR - MACHINING
Flexible Manufacturing System
Reduction in direct labour.
Avoid recruiting extra direct labour.
Improved use of machinery and throughput of parts.
Reduced set up time.
Reduced downtime.

Group Technology
Reduced set up time.
Standardised process plans.
Increased manufacturing efficiency.
Reduced inventory.
Improved tool utilisation.

Computer Numerical Control (CNC)
Reduced time spent programming machines.
Reduction in direct labour.
Avoid recruiting additional direct labour.
Reduction in testing process capability.
On-line access to maintenance status.

Distributed Numerical Control (DNC)
Reduced time spent programming machines.
Reduction in direct labour.
Avoid recruiting additional direct labour.
Reduction in testing process capability.
On-line access to maintenance status.

RULE 3 (Continued).
Benefits for Reduced Costs.
Turning/Machining Centres
Reduced need for second operations on other machines.
Reduced waste through greater accuracy.
Reduced need for further surface finishing.
Multi-function capability reduces need for complimentary machining operations.
Reduced operator supervision.
Avoid recruiting additional operators.
Automatic tool change reduces set up times.

Minimise Set Up Times
Avoid purchase of additional machinery by improved throughput.
Avoid purchase of additional machinery by improved flexibility.
Reduce number of tool change personnel.
Avoid recruiting addition tool change personnel.

Pre Set Tooling
Avoid purchase of additional machinery by improved throughput and/or flexibility.

Operator Inspection
Reduce number of supervisors.
Avoid recruiting additional supervisors.
Reduced waste through operator 'ownership' of process increases quality.
Reduced direct labour turnover from improved job satisfaction.
Reduced training costs.
Reduced employee absenteeism.
Reduced overtime.

Automatic Tool Change
Reduced set up times.
Reduce or eliminate operator supervision.

Operator Training for Multi-tasking/skill
Reduce number of operators.
Avoid recruiting additional operators.
Reduced waste.

LABOUR - ASSEMBLY
Flexible Assembly System
Reduction in direct labour.
Avoid recruiting extra direct labour.
Improved use of machinery and throughput of parts.
Reduced set up time.
Reduced downtime.

Minimise Set Up Times
Avoid purchase of additional machinery by improved throughput.
Avoid purchase of additional machinery by improved flexibility.
Reduce number of tool change personnel.
Avoid recruiting additional tool change personnel.

RULE 3 (Continued).
Benefits for Reduced Costs.
Pre Set Tooling
Avoid purchase of additional machinery by improved throughput.
Avoid purchase of additional machinery by improved flexibility.

Auto Insertion
Reduce number of operators.
Avoid recruiting additional operators.

Operator Training
Reduce number of operators.
Avoid recruiting additional operators.

Robots
Reduce number of operators.
Avoid recruiting additional operators
Avoid overtime.
Improved throughput.
Reduce number of tool change personnel.
Avoid recruiting addition tool change personnel.
Multi-function capability reduces need for complimentary assembly operations.
Reduced operator supervision.
Avoid recruiting additional supervisors.
Consistent repeatability reduces waste.
Increased flexibility.

Dedicated Machines
Reduce number of operators.
Avoid recruiting additional operators.
Reduce number of tool change personnel.
Avoid recruiting addition tool change personnel.
Reduced operator supervision.
Avoid recruiting additional supervisors.
Consistent repeatability reduces waste.

PRODUCTION
Job Enrichment - Operator Responsibility
Reduced waste through operator 'ownership' of process increases quality.
Reduced direct labour turnover from improved job satisfaction.
Reduced training costs.
Reduced employee absenteeism.
Reduced overtime.

Automated Guided Vehicles (AGV's)
Improved material, parts and tools flow reducing WIP.
Improved material, parts and tools supply reducing delays.
Reduced production transport personnel.
Reduced assembly personnel.

RULE 3 (Continued).
Benefits for Reduced Costs.
INSPECTION AND TEST
Operator Inspection Scheme
Reduce number of supervisors.
Avoid recruiting additional supervisors.
Reduced waste through operator 'ownership' of process increases quality.
Reduced direct labour turnover from improved job satisfaction.
Reduced training costs.
Reduced employee absenteeism.
Reduced overtime.

Continuous Improvement Monitoring
Reduced advertising costs resulting from improved quality.
Reduced warranty and service through improved quality.
Reduced waste and rework.
Reduced direct labour turnover from improved job satisfaction.
Reduced employee absenteeism.
Reduced need for 'fire fighting' teams.
Reduced WIP.
Reduced raw materials inventory.
Improved throughput.
Increased flexibility.
Savings from reduction in space/buildings/energy from reduced WIP.
Savings from reduction in space/buildings/energy from reduced inventory.
Reduced errors in production documentation.
Reduced inspection and test personnel.
Avoid recruiting additional inspection and test personnel..

Statistical Process Control (SPC)
Reduced waste and rework.
Reduced warranty claims.
Increased operator 'ownership'.
Identification of problematical processes.
Reduce number of inspection and test personnel.
Avoid recruiting additional inspection and test personnel.
Automatic generation of quality status reports, reduces clerical personnel.
Faster response to processes running out of control, prevents scrap.
Reduce practice of 100% inspection on critical processes.
Increases engineers' efficiency.
Prioritise problems, enabling most costly problems to be dealt with first.
Long term trend analysis providing data on future maintenance requirements.
Reduction in gauge equipment.
Reduction in downtime.
Avoid recruiting additional production operators.
Reduce number of production operators

RULE 3 (Continued).
Benefits for Reduced Costs.
Total Quality Management (TQM)
Improved process control.
Reduced scrap and rework.
Reduced machine breakdown.
Reduced absenteeism.
Reduced time spent testing and checking goods in, manufactured and goods out.
Reduced engineering design changes.
Reduced recalls.

Quality Circles (QC)
Reduced scrap and rework.
Reduced absenteeism.
Increased operator 'ownership' increases quality.
Identification of problematical processes.
Improved throughput.

Corrective Action Teams (CAT)
Shorter machine downtime.
Reduced scrap and rework.
Reduced tool damage.
Improved production flow reduces WIP.

Automatic Test Equipment (ATE)
Reduced number of test personnel.
Reduced number of recalls.
Reduced warranty claims.
Avoid recruiting additional test personnel.

Co-Ordinate Measuring Machines
Reduced inspection time and costs
Reduced number of inspection personnel.
Avoid recruiting additional inspection personnel.

RULE 4.
Benefits for Reduced Cost
RAW MATERIALS AND BOUGHT OUT PARTS
Vendor Rating Management
Known performance reduces waste.
Reduce time spent finding alternatives in case of default of usual supplier.

Open Orders
Reduce inventory.
Reduce inventory space.
Reduce scrap and waste.
Improved cash flow.

RULE 4 (Continued).
Benefits for Reduced Costs.
Re-negotiate Supplier/Delivery Contracts
Reduce purchase price.
Increase time period or amount of credit facility.
Reduce/increase economic order quantity.
Reduce/increase part/material order quality.
Reduce inventory levels and/or inventory space.

Reduce Scrap
Reduce scrap and waste.
Reduce rework due to faulty parts and materials.
Reduce inventory space.

Electronic Data Interchange (EDI)
Reduce time spent repeating data..
Reduce number of materials management staff.
Improved accuracy of data, preventing scrap and rework.
Reduce variations of same data.

Procurement Engineering (Parts Only)
Fixed costs can be achieved.
Reduced costs for goods in inspection and test.
Improved quality, reduces waste.
Increased flexibility.

INVENTORY MANAGEMENT
Automated Warehousing, Storage and Retrieval System
Real time data on inventory levels.
Automatic storage and retrieval reduces time and costs.
Optimised use of storage space.
Reduce number of warehouse personnel.
Avoid recruiting additional warehouse personnel.
Reduced scrap and lost goods.

RULE 5.
Benefits for Reduced Cost
FACILITIES
Sales Order Processing System
Reduce number of sales order processing personnel.
Avoid recruiting additional sales order personnel.
Reduce time spent processing sales orders.
Reduce number of forms and documentation.

Change Packaging
Reduce cost of materials.
Reduce number of packaging personnel.
Avoid recruiting additional packaging personnel.
Reduce storage space of packaging materials.
Increase usability of present inventory space
Decrease inventory space.

RULE 5 (Continued).
Benefits for Reduced Costs
Automatic Packaging
Reduce number of packaging personnel.
Avoid recruiting additional packaging personnel.
Reduce training costs.
Reduce number of supervisors.
Avoid recruiting additional supervisors.

Re-negotiate Supplier/Delivery Contracts
Reduce purchase price.
Increase time period or amount of credit facility.
Reduce/increase economic order quantity.
Reduce/increase part/material order quality.
Reduce inventory levels.
Reduce inventory space.

RULE 6.
Benefits for Reduced Cost
PRODUCTION OVERHEADS AND SCHEDULING
Factory Management Systems
Improved planning reduces delays.
Improved throughput.
Improved control and efficiency.

Energy Management
Improved insulation reduces heating costs.
Timer control reduces energy costs.
Heat distribution systems reduces need to purchase energy.
'Lights out' manufacturing used where production is automated.

Minimise Factory Layout
Reduced floor space, reduces rental costs.
Sub-letting of floor space.
Avoid purchase of additional production space.
Reduce energy consumption.
Avoid additional AGV's, conveyors, etc..

Production Control System.
Improved throughput.
Reduced WIP.
Reduction in production overheads.
Prevention of 'stock outs'.

Pre-Planned Maintenance
Reduced unplanned production stoppages.
Improved production flow reduces WIP.
Improved production forecasting prevents under utilisation of machines/processes.

RULE 6 (Continued).
Benefits for Reduced Costs
Materials Requirements Planning (MRP)
Minimise inventory.
Reduced storage costs.
Reduce capital tied up in inventory.
Improved planning prevents 'stock outs', halting production.
Reduce WIP.
Reduction in time spent 'chasing' orders.

Manufacturing Resource Planning (MRPII)
Minimise inventory.
Reduced storage costs.
Reduce capital tied up in inventory.
Improved planning prevents 'stock outs', halting production.
Reduce WIP.
Improved machine utilisation.
Improved labour utilisation.
Reduction in time spent 'chasing' orders.

Computer Aided Production Management (CAPM)
Minimise inventory.
Reduced storage costs.
Reduce capital tied up in inventory.
Improved planning prevents 'stock outs', halting production.
Reduce WIP.
Improved machine utilisation.

RULE 7.
Benefits for Reduced Cost
FACILITIES
Desk Top Publishing System
Reduce use of outside sub-contractors.
Improve accuracy of hard copy reduces waste.
Print only hard copy when required.
Reduce inventory of hard copy, reduces damage and obsolescence.
Reduced hard copy inventory reduces space requirements.
Avoid purchase/rent of additional storage space for sales and marketing data.

On-Line Access to Operations
Reduce time spent chasing information.
Accurate information reduces scrap and rework.
Prevention of 'stock outs'.
Improved estimating and costing, reducing number of uneconomical orders.
Improved communication between Support process, design, materials management, production and Management, increases efficiency.

RULE 7 (Continued).
Benefits for Reduced Costs
Electronic Data Interchange.
Reduce time spent repeating data..
Reduce number of clerical staff.
Avoid recruiting additional clerical staff.
Improved accuracy of data, preventing scrap and rework.
Reduce variations of same data.

RULE 8.
Benefits for Reduced Cost
COMPANY WIDE OVERHEADS
Management Information System
Improved control of key data.
Real time access to management data, improves management efficiency.
Managers responsible for own reports, communications, reduces clerical staff.
Avoid recruiting additional clerical staff.

Electronic Data Interchange. (EDI)
Reduce time spent repeating data..
Reduce number of clerical staff.
Improved accuracy of data, preventing scrap and rework.
Reduce variations of same data.

Business Process Simplification
Identification of high cost centres.
Identification of activities or processes that do not add value.

RULE 9.
Benefits for Reduced Lead Time
DESIGN AND CUSTOMISATION
Computer Aided Design (CAD)
In house system avoids outside subcontract design work.
Eliminate model making through 3-dimensional design.
Improved drawings reduce production times.
Reduced scrap and rework.
Eliminate 'stock outs'.
Component standardisation enables larger batch sizes to be produced.
Elimination of unprofitable orders by improved estimating.

Design For Assembly (DFA)
Reduced number of parts to, buy out and/or assemble.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Reduced assembly times.
Reduce delivery lead time through change in materials.
Reduce delivery lead time through change in bought out parts.
Reduce delivery lead time through change in process.

RULE 9 (continued).
Benefits for Reduced Lead Time
Design For Manufacture (DFM)
Reduced number of parts to manufacture.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Reduced manufacturing times.
Reduce delivery lead time through change in materials.
Reduce delivery lead time through change in bought out parts.
Reduce delivery lead time through change in process.

Parts Database
Select parts of known delivery lead time.
Eliminate incorrect orders.
Identify new parts with shorter lead times.
Specify parts that company have high inventory of.
Component standardisation enables larger batch sizes to be produced.

RULE 10.
Benefits for Reduced Lead Time
Change Process
Improved use of machinery and throughput of parts.
Reduced set up time.

Process Simplification.
Improved material flow reducing WIP.
Improved through put.

RULE 11.
Benefits for Reduced Lead Time
Additional Machine
Known output.
Known capabilities.
Reduce set-up time from experience.
Reduce downtime through experience.

LABOUR - SET-UP AND MACHINING
Cell Manufacturing
Improved use of machinery and throughput of parts.
Reduced set up time.
Reduced downtime.

Group Technology
Reduced set up time.
Standardised process plans.
Increased manufacturing efficiency.
Reduced inventory.
Improved tool utilisation.

RULE 11 (continued).
Benefits for Reduced Lead Time
Dedicated Machines
Reduced need for second operations on other machines.
Reduced waste through greater accuracy.
Reduced need for further surface finishing.
Automatic tool change reduces set up times.

Pre Set Tooling
Faster changeover times.
Improved throughput and flexibility.

Minimise Set Up Times
Improved throughput and flexibility.

LABOUR - ASSEMBLY
Flexible Automated Assembly System
Improved use of machinery and throughput of parts.
Reduced set up time.
Reduced downtime.

Auto Insertion
Reduced set up time.
Reduced downtime.

Dedicated Assembly Machines
Consistent repeatability.
Reduced set up time.
Reduced downtime.

Automated Guided Vehicles (AGV's)
Improved material, parts and tools flow.
Improved material, parts and tools supply reducing delays.
Pre-set transport timing.
Moveable assembly line reduces time.

PRODUCTION
Trial Kiting - Simulation
Simulation identifies problematical processes and operations prior to production.
Identifies tool requirements prior to production.
Improves production planning requirements.
Reduction in waste and rework.
Improved utilisation of resources.

INSPECTION AND TEST
Operator Inspection Scheme
Reduced rework and waste through operator 'ownership' of process quality.
Retention of skilled labour force.
Reduced employee absenteeism.
Reduced overtime.

RULE 11 (continued).
Benefits for Reduced Lead Time
Continuous Improvement Monitoring
Reduced waste and rework.
Reduced employee absenteeism.
Reduced 'fire fighting' teams.
Reduced WIP.
Improved throughput.
Increased flexibility.
Reduced errors in production documentation.

Automatic Test Equipment (ATE)
Increased consistency of results.
Reduced re-testing and recalls.

Co-Ordinate Measuring Machines
Improves throughput.
Reduced inspection time.

Design For Test (DFT)
Improved design reduces time spent testing products.

RULE 12.
Benefits for Reduced Lead Time
RAW MATERIALS AND BOUGHT OUT PARTS
Vendor Rating Management
Improved knowledge of vendor capabilities for delivery and reliability.
Improved knowledge of alternative vendors.

Open Orders
Small batch size orders for unexpected requirements.
Select vendor who provides faster delivery times.

Electronic Data Interchange (EDI)
Improved accuracy avoids repeating orders.
Faster response time.

RULE 13.
Benefits for Reduced Lead Time
MARKETING
Sales Order Processing Systems
Faster response time.
Improved accuracy reduces repeating orders.
Printed output reduces risk of errors caused by illegible hand writing.

Electronic Data Interchange (EDI)
Improved accuracy avoids repeating orders.
Faster response time.
Improved access to inventory and production output data..

RULE 13 (continued).
Benefits for Reduced Lead Time
Standardised Products
Reduced variation reduces production delays, set up times, downtime.
Supply from stock.
Reduced inventory.
Reduced waste and rework.
Improved quality.
Real time access to stock data.
Move towards JIT.

ESTIMATING AND COSTING
Computer Supported Estimating and Costing
Improved accuracy avoids repeating orders.
Faster response time.
Improved product costing reduces time spent quoting for uneconomic orders.
Improved resource data.

Activity Based Costing (ABC)
Improved product costing reduces time spent quoting for uneconomic orders.
Improved accuracy of cost data.
Improved resource data.

Vendor Rating Management
Improved knowledge of vendors capabilities reduces selection of long lead time orders.

RULE 14.
Benefits for Reduced Lead Time
PRODUCTION OVERHEADS AND SCHEDULING
Accurate Shop Floor Production Data Collection
Improved knowledge of current production status improves scheduling.
Improved machine utilisation.
Reduces time spent 'chasing' for part/product data.

PRODUCTION OVERHEADS AND SCHEDULING
Kanban
Reduces waste and delay between customers within a business.
Pull system improves make to order capability.
Reduced WIP.
Improved manufacturing control.
Increased flexibility and small batch size production.

Just In Time (JIT)
Reduces waste and delay between suppliers and business, within business and between business and customer.
Reduced WIP.
Improved manufacturing control.
Improved synchronised operations, increases flow.
Increased flexibility and small batch size production.
Pull system improves make to order capability.

RULE 14 (continued).
Benefits for Reduced Lead Time
Optimised Production Technology (OPT)
Reduces bottlenecks.
Improved machine utilisation.
Improved throughput.

Materials Requirements Planning (MRP)
Improved planning prevents 'stock outs', halting production.
Reduction in time spent 'chasing' orders.

Manufacturing Resource Planning (MRPII)
Improved planning prevents 'stock outs', halting production.
Improved resource utilisation.
Reduction in time spent 'chasing' orders.

Computer Aided Production Planning (CAPP)
Improved planning prevents 'stock outs', halting production.
Improved resource utilisation.
Improved throughput.
Reduction in time spent 'chasing' orders.

Computer Aided Production Management (CAPM)
Improved Management prevents 'stock outs', halting production.
Improved resource utilisation.
Reduction in time spent 'chasing' orders.

RULE 15.
Benefits for Improved Delivery Performance
PURCHASING
Vendor Rating Management
Improved knowledge of vendors capabilities reduces selection of goods from unreliable vendors.

RULE 16.
Benefits for Improved Delivery Performance
PRODUCTION
Additional Machine
Known capability.
Known throughput.
Known reliability.

Trial Kitting - Simulation
Simulation identifies problematical processes and operations prior to production.
Identifies tool requirements prior to production.
Improves production planning requirements.
Reduction in waste and rework.
Improved utilisation of resources.

RULE 16 (continued).
Benefits for Improved Delivery Performance
Automated Guided Vehicles (AGV's)
Improved material, parts and tools flow.
Improved material, parts and tools supply reducing delays.
Reduced transport times.

MACHINING
Preventative Maintenance
Reduces unexpected breakdowns and stoppages.
Reduces number of set up times.

RULE 17.
Benefits for Improved Delivery Performance
MARKETING AND SALES ORDER PROCESSING
Accurate Capacity Data
Improved scheduling.
Reduces sales of long lead time products.

Accurate Delivery Time Data
Reduces delays and number of repeat journeys to customer premises.
Improves planning capability.

ESTIMATING AND COSTING
Production Control Data System
Improves production planning requirements.
Reduction in waste and rework.
Identifies problematical processes and operations.

RULE 18.
Benefits for Improved Delivery Performance
PRODUCTION OVERHEADS AND SCHEDULING
Accurate Shop floor Production Data Collection
Improved accuracy reduces errors and rework.
Improved throughput.
Improved scheduling.

RULE 19.
Benefits for Improved Product quality
DESIGN AND CUSTOMISATION
Computer Aided Design (CAD)
Reduce or avoid subcontract design work.
Eliminate model making through 3-dimensional design.
Improved drawings reduce production costs.
Reduced scrap and rework.
Eliminate 'stock outs'.
Component standardisation.

RULE 19 (continued).
Benefits for Improved Product Quality
Computer Aided Design Computer Aided Manufacturing (CADCAM)
Improved drawings.
Reduced scrap and rework.

Design For Assembly (DFA)
Reduced number of parts to buy out and/or assemble.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Improved quality through change in materials, bought out parts or change in process.

Design For Manufacturing (DFM)
Reduced number of parts to manufacture.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Improved quality through change in materials, bought out parts or change in process.

Standardised Material Sizes (Raw Materials Only)
Reduced variation in material sizes inventory.
Use of materials of known quality.

Procurrement Engineering (Parts Only)
Reduced variation in parts inventory.
Use of parts of known quality.

Change Materials
Use of improved materials.
Identify new parts of improved quality.
Component standardisation.

BS5750/ISO 9000
Use of raw materials and bought out parts of known quality.
Recognised quality status.
Accreditation is pre-requisite to supply certain customers.
Provides documented procedures to reduce quality problems.

RULE 20.
Benefits for Improved Product Quality
Process Simplification.
Identification of problematical processes.

RULE 21.
Benefits for Improved Product Quality
MACHINING AND ASSEMBLY
Computer Numerical Control (CNC)
Consistent process capability.
On-line access to maintenance status.

Distributed Numerical Control (DNC)
Consistent process capability.
On-line access to maintenance status.

Dedicated Machines (Manufacturing)
Consistent process capability.
On-line access to maintenance status.

Automatic Tool Changes
Reduces human error.
Consistent process capability.

Yoki Poki
Improved process yields.
Improved delivery capability.
Reduction in maintenance.
Reduced waste and rework.

INSPECTION AND TEST
Statistical Process Control (SPC)
Reduced waste and rework.
Reduced warranty claims.
Increased operator 'ownership'.
Identification of problematical processes.
Automatic generation of quality status reports, reduces clerical personnel.
Faster response to processes running out of control, prevents unnecessary scrap.
Reduce practice of 100% inspection on critical processes.
Increases engineers' efficiency.
Prioritise problems.
Long term trend analysis providing data on future maintenance requirements
Reduction in gauge equipment.
Reduction in downtime.

Total Quality Management (TQM)
Improved process control.
Improved 'ownership' of operations.
Reduced absenteeism.
Reduced scrap and rework.
Reduced machine breakdown.
Reduced time spent testing and checking goods in, manufactured and goods out.
Reduced engineering design changes.
Reduced recalls.

RULE 21 (continued).
Benefits for Improved Product Quality
MACHINING AND ASSEMBLY
Quality Circles (QC)
Reduced scrap and rework.
Reduced absenteeism.
Increased operator 'ownership'.
Identification of problematical processes.
Improved throughput.

Corrective Action Teams (CAT)
Reduced scrap and rework.
Reduced tool damage.

Operator Inspection Scheme
Reduced rework and waste through operator 'ownership' of process quality.
Retention of skilled labour force.
Reduced employee absenteeism.
Reduced overtime.

Continuous Improvement Monitoring
Reduced waste and rework.
Reduced employee absenteeism.
Reduced 'fire fighting' teams.
Reduced WIP.
Improved throughput.
Increased flexibility.
Reduced errors in production documentation.

Co-Ordinate Measuring Machines
Automatic inspection of part/product accuracy.

Pre-Planned Maintenance
Improved reliability and performance of machinery.

Condition Based Monitoring
Improved reliability and performance of machinery.

RULE 22.
Benefits for Improved Product Quality
RAW MATERIALS AND BOUGHT OUT PARTS
Vendor Rating Management
Improved knowledge of vendors capability.

Procurement Engineering (Parts Only)
Co-operation between supplier and customer to meet quality requirements of customer.

Standardised Material Sizes (Raw Materials Only)
Reduced variation.
Purchase of raw materials of known quality only.

RULE 23.
Benefits for Improved Product Quality
MARKETING AND SALES
Formal Agreement of Requirements
Agreed quality requirements.
Contractual obligation of supplier to meet quality standards.

PACKAGING AND DELIVERY
Redesign Packaging Materials
Reduce risk of damage to products in transit.
Reduced warranty claims.
Reduced Insurance costs.
Improved handling, weight, size.

Redesign Packaging Methods
Improved handling, weight, size.
Reduce risk of damage.
Reduce waste of packaging materials.
Reduce warranty claims.

RULE 24.
Benefits for Improved Product Quality
PRODUCTION OVERHEADS AND SCHEDULING
Accurate Shop Floor Production Data Collection
Reduction in incorrect production data.

Total Quality Management
Improved process control.
Improved 'ownership' of operations.
Reduced absenteeism.
Reduced scrap and rework.
Reduced machine breakdown.
Reduced time spent testing and checking goods in, manufactured and goods out.
Reduced engineering design changes.
Reduced recalls.

RULE 25.
Benefits for Improved Customer Service
INVENTORY
Inventory Management
Improved knowledge of inventory.
Improved supply and delivery time data.

JIT Inventory Control
Reduce waste and scrap.
Improved knowledge of inventory.
Improved supply and delivery time data.

RULE 25 (continued).
Benefits for Improved Customer Service
Kanban Inventory Control
Improved knowledge of inventory.
Improved supply and delivery time data.

RULE 26.
Benefits for Improved Customer Service
LOCAL DISTRIBUTION
Training
Improved employee knowledge of product data.
Improved knowledge of inventory.
Improved supply and delivery time data.

AFTER SALES SERVICE
On-Site Support Training
Real time advice on installation, application, operation and maintenance of products.

Hotline Support Training
Real time advice on installation, application, operation and maintenance of products.
Help line to assist urgent customer problems.
Improved customer satisfaction knowing help is at hand.

Installation and Commissioning Training
Verification by customer of product.
Real time advice on installation, application, operation and maintenance of products.

Warranty and Guarantee
Real time advice on installation, application, operation and maintenance of products.
Improved customer satisfaction knowing product is covered against faults and breakdown.
Extension options reassures customers.

RULE 27.
Benefits for Improved Customer Service
Total Quality Management
Improved 'ownership' of operations.
Improved customer service.
Reduced absenteeism.
Reduced scrap and rework.
Reduced time spent checking goods out.
Reduced recalls.

RULE 28.
Benefits for Improved Functionality and Features
RESEARCH & DEVELOPMENT
Computer Aided Design (CAD)
Three-dimensional design capability.
Improved drawings.
Reduced scrap and rework.
Eliminate 'stock outs'.
Component standardisation.

Design For Assembly (DFA)
Reduced number of parts to manufacture, buy out and/or assemble.
Reduced variation in parts inventory.
Improved functionality and features through change in materials and/or bought out parts and/or process.

Design For Manufacture (DFM)
Reduced number of parts to manufacture, buy out and/or assemble.
Reduced variation in parts inventory.
Improved functionality and features through change in materials.
Improved functionality and features through change in bought out parts.
Improved functionality and features through change in process.

DESIGN
Computer Aided Design (CAD)
Three-dimensional design capability.
Improved drawings.
Reduced scrap and rework.
Eliminate 'stock outs'.
Component standardisation.

Design For Assembly (DFA)
Reduce delivery lead time through change in process.
Reduced number of parts to buy out and/or assemble.
Reduced variation in parts inventory.
Improved functionality and features through change in materials.
Improved functionality and features through change in bought out parts.
Improved functionality and features through change in process.

Design For Manufacture (DFM)
Reduce delivery lead time through change in process.
Reduced number of parts to manufacture.
Reduced variation in parts inventory.
Improved functionality through change in materials and bought out parts
Improved functionality and features through change in process.

Modular Design
State of the art product design.
Upgrades limited to only out-dated modules.
Wider product portfolio.
Faster response.

RULE 29.
Benefits for Increased Capacity
Computer Aided Design (CAD)
Increase productivity by draughtsmen.
Reduce or avoid subcontract design work.
Eliminate model making through 3-dimensional design.
Improved drawings reduce production delays.

Design For Assembly (DFA)
Increase output by reducing number of parts to buy out and/or assemble.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Increase flexibility through change in materials and bought out parts
Increase flexibility through change in process.

Design For Manufacturing (DFM)
Increase output by reducing number of parts to manufacture,.
Reduced variation in parts inventory.
Reduced scrap and rework.
Reduced WIP.
Increase flexibility through change in materials and .bought out parts
Increase flexibility through change in process.

RULE 30.
Benefits for Increased capacity
Change Process
Less waste through use of alternative process.
Improved use of machinery and throughput of parts.
Reduced set up time.

Process Simplification
Simplification of processes resulting in identification of low capacity centres.
Improved material flow reducing WIP.
Improved throughput.

Computer Aided Process Planning (CAPP)
Reduced time spent planning processes.
Improved throughput of materials, parts, etc.
Reduce WIP.
Improved accuracy of production forecasts preventing 'stock outs'.

MACHINING
Flexible Manufacturing System
Improved use of machinery and throughput of parts.
Reduced set up time.
Reduced downtime.

RULE 31.
Benefits for Increased Capacity
Additional Machine
Known throughput.
Known capabilities.

Computer Numerical Control (CNC)
Reduced time spent programming machines.
Reduction in testing process capability.
On-line access to maintenance status.

Distributed Numerical Control (DNC)
Reduced time spent programming machines.
Reduction in testing process capability.
On-line access to maintenance status.

Turning/Machining Centres
Reduced need for second operations on other machines.
Reduced waste through greater accuracy.
Reduced need for further surface finishing.
Multi-function capability reduces need for complimentary machining operations.
Reduced operator supervision.
Automatic tool change reduces set up times.

Minimise Set Up Times
Avoid purchase of additional machinery by improved throughput.
Avoid purchase of additional machinery by improved flexibility.

ASSEMBLY
Flexible Assembly System
Improved use of machinery and throughput of parts.
Reduced set up time and downtime.

Robots
Improved throughput.
Reduce number of tool change personnel.
Multi-function capability reduces need for complimentary assembly operations.
Reduced operator supervision.
Consistent repeatability reduces waste.
Increased capacity.

Automated Guided Vehicles (AGV's)
Improved material, parts and tools flow and/or supply reducing delays.
Reduced transport timing.
Assembly in motion.

INSPECTION AND TEST
Operator Inspection Scheme
Reduced waste through operator 'ownership' of process quality.
Reduced employee absenteeism.
Reduced overtime.

RULE 31 (continued).
Benefits for Increased Capacity
Automatic Test Equipment (ATE)
Improved product flow.
Reduced risk of human error.

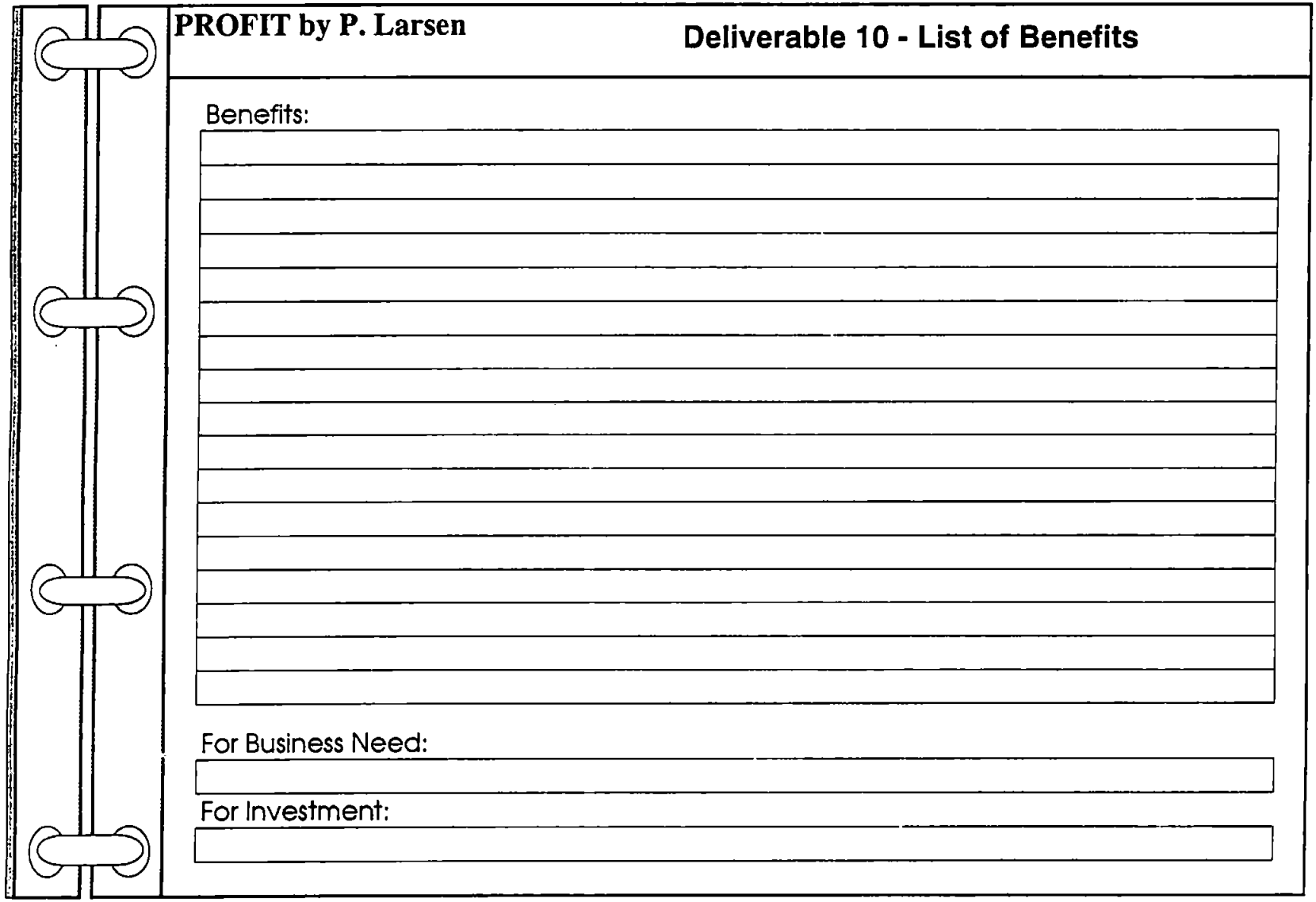
RULE 32.
Benefits for Increased Capacity
RAW MATERIALS AND BOUGHT OUT PARTS
Re-negotiate Supplier/Delivery Contracts
Increased/decreased volume.
Increased/decreased flexibility.
Increased/decreased deliveries.
Batch size of one.
Economies of scale.

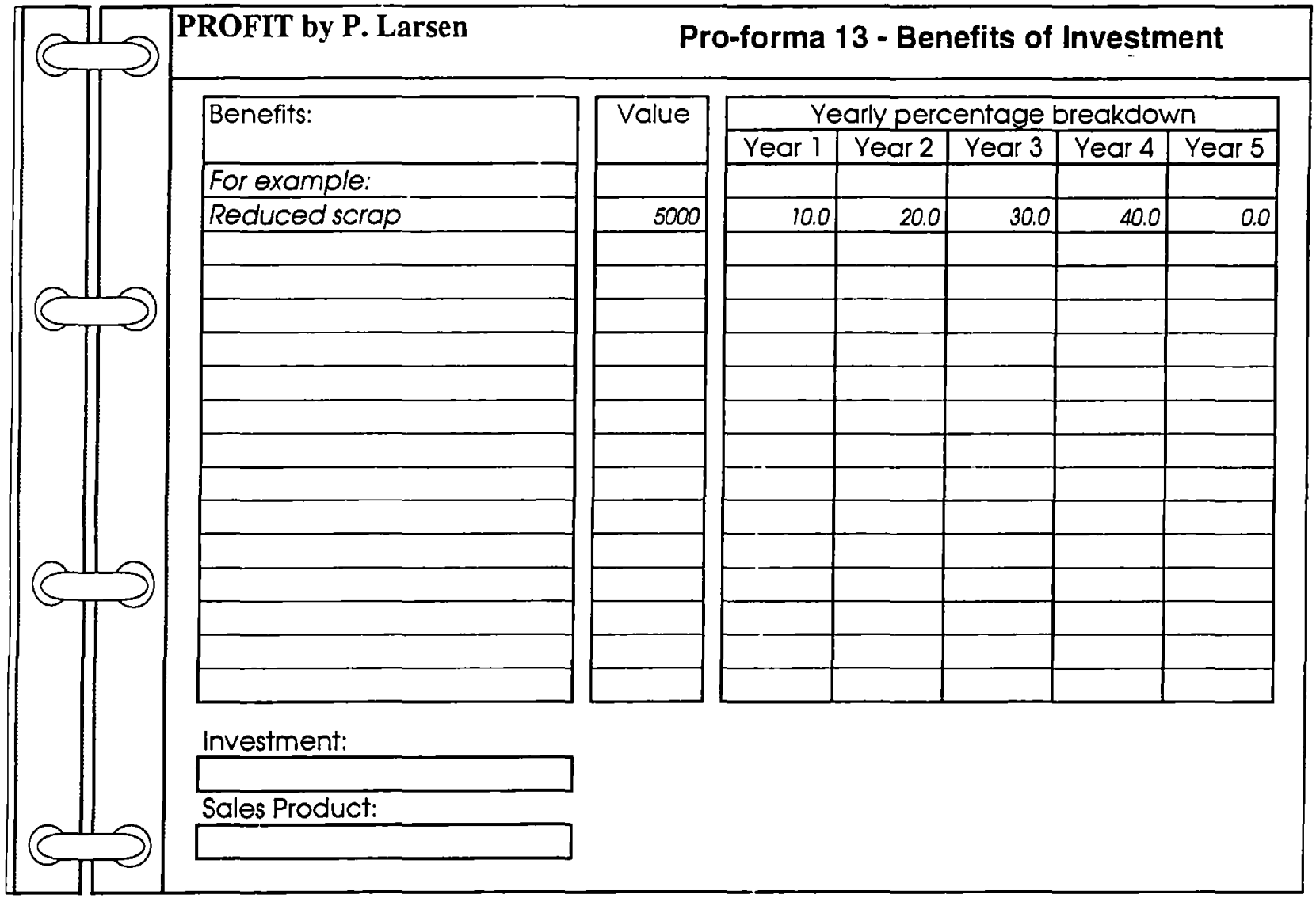
Procurement Engineering (Parts Only)
Improved product specification.

INVENTORY MANAGEMENT
Automated Warehousing, Storage and Retrieval System
Real time data on inventory levels.
Automatic storage and retrieval.
Faster than human equivalent.
Optimised use of storage space.

RULE 33.
Benefits for Increased Capacity
Change Packaging
Increased throughput.
Increased capacity.
Increased productivity.

RULE 34.
Benefits for Increased Capacity
SCHEDULING
Factory Scheduling Systems
Increased output and flexibility


PROFIT by P. Larsen
Deliverable 10 - List of Benefits
Benefits:
For Business Need:
For Investment:



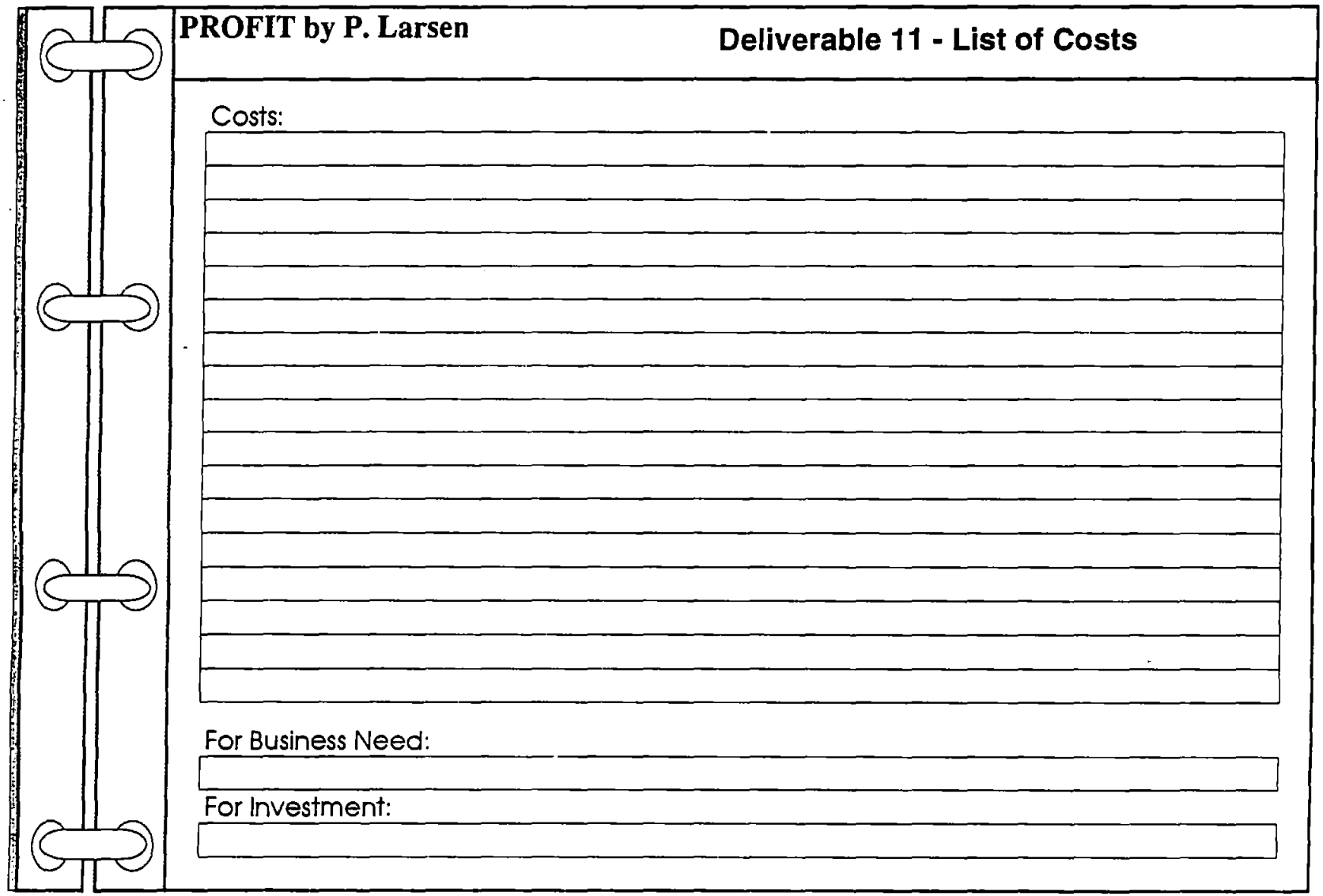
PROFIT by P. Larsen

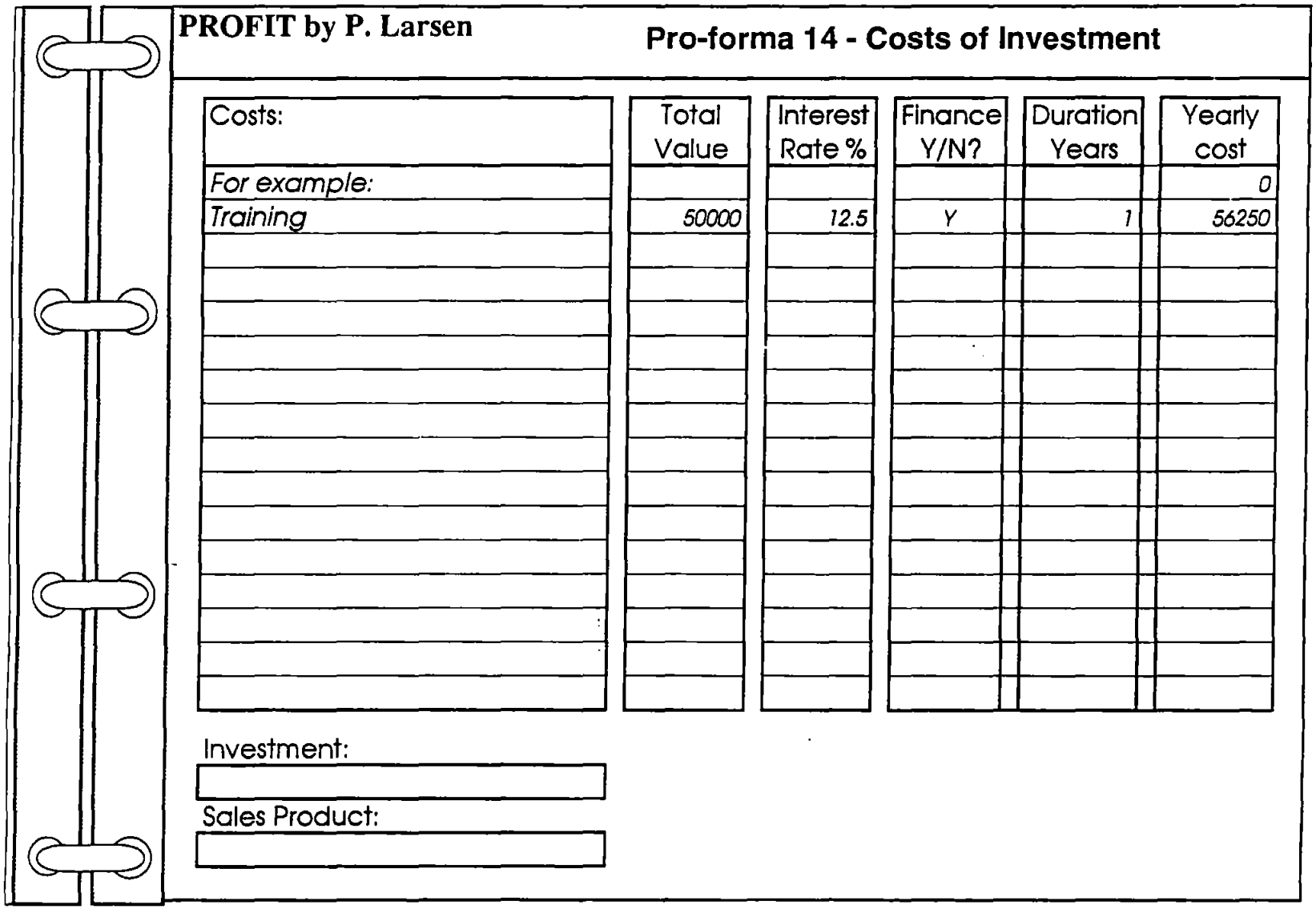
Pro-forma 13 - Benefits of Investment

Benefits:	Value	Yearly percentage breakdown				
		Year 1	Year 2	Year 3	Year 4	Year 5
For example:						
Reduced scrap	*5000*	*10.0*	*20.0*	*30.0*	*40.0*	*0.0*

Investment:

Sales Product:


PROFIT by P. Larsen
Deliverable 11 - List of Costs
Costs:
For Business Need:
For Investment:



PROFIT by P. Larsen

Pro-forma 14 - Costs of Investment

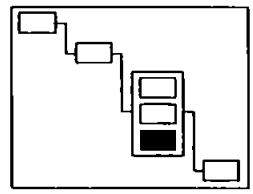
Costs:	Total Value	Interest Rate %	Finance Y/N?	Duration Years	Yearly cost
For example:					*0*
Training	*50000*	*12.5*	*Y*	*1*	*56250*

Investment:

Sales Product:

Stage Three - Option Three Evaluate Investment(s)

Workshop 3.3



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Production and Sales.

Rationale:

The first step of Workshop 3.3 is, from the list of Investments specified in the PROFIT Methodology, to select those that match the investment proposal(s) of the Company. Toolkit 3.3.1 lists the Investments covered by PROFIT. In Toolkit 3.2.3. a description of each investment can be found to aid the selection of matching investments.

When the investment has been selected, complete Deliverable 12- Select Investment.

The second step involves checking the Potential for Change (Deliverable 8). There is little point in selecting an investment if it requires changing a part of the company that cannot be changed. After completion of the potential for change Toolkit 3.2.2 is used to complete Deliverable 9 - Agreed Investment.

The third step requires selecting, from the list provided by PROFIT, the business need that each investment addresses (Deliverable 7). Toolkit 3.3.3 provides assistance. This enables the identification of the benefits and costs, which should either be copied from the Workbook or printed off from the CBT on to Deliverables 10 and 11 respectively.

The details of the benefits (Deliverable 10) are sent to the appropriate functional areas of the Company to enable quantification of the benefits being entered on Pro-forma 13.

The details of the investment are also sent out to possible vendors to obtain quotes regarding costs and time periods involved in any implementation for discussion in Workshop 4, using Deliverable 11 and Pro-forma 14.

The information from the vendors enables the completion of Pro-forma 14 and should include the cost of the investment, the investment period and interest rate applicable.

Actions Required:

Tasks:

Select investment.

Check potential for change.

Select business need.

Complete:

Deliverable 12 - Selected Investment

Deliverable 9 - Agreed Investment

Deliverable 8 - Agreed Potential for Change

Deliverable 7 - Agreed Business Need

Print off:

Deliverable 10 - List of Benefits for Investment.

Deliverable 11 - List of Costs for Investment.

Send Out:

Pro-forma 13 - Benefits of Investment.

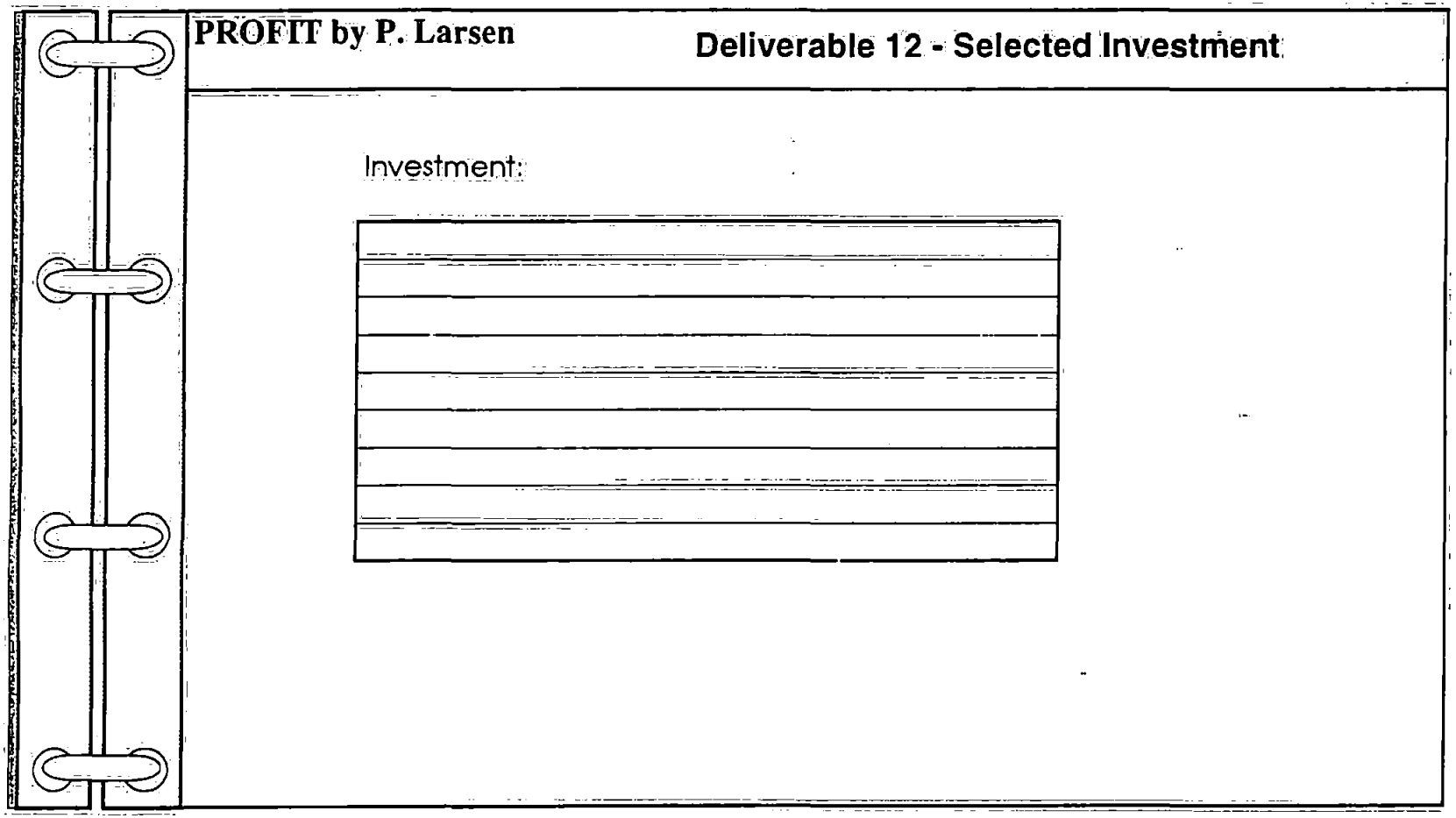
Pro-forma 14 - Costs of Investment.

Toolkit 3.3.1.

From the list of investments below, select investment that matches the Company's investment. For a brief description of each investment consult Toolkit 3.2.2 Descriptions. A list of the Investments covered by PROFIT follows:

- Computer Aided Design (CAD)
- Packaging Redesign
- Design For Assembly (DFA)
- Design For Manufacture (DFM)
- Design For Test (DFT)
- Parts Database
- Change Process
- Process Simplification
- Additional Machine (Assembly and/or Manufacturing)
- Flexible Manufacturing System
- Group Technology
- Computer Numerical Control (CNC)
- Distributed Numerical Control (DNC)
- Turning/Machining Centres
- Minimise Assembly and Production Set Up Times
- Pre Set Tooling
- Automatic Tool Change
- Operator Training for Multi-tasking/skill
- Flexible Assembly System
- Auto Insertion
- Operator Training
- Robots
- Dedicated Machines (Assembly and/or Manufacturing)
- Job Enrichment - Operator Responsibility
- Automated Guided Vehicles (AGV's)
- Operator Inspection Scheme
- Continuous Improvement Monitoring
- Statistical Process Control (SPC)
- Total Quality Management (TQM)
- Quality Circles (QC)
- Corrective Action Teams (CAT)
- Automatic Test Equipment (ATE)
- Co-Ordinate Measuring Machines
- Vendor Rating Management
- Open Orders
- Reduce Scrap
- Electronic Data Interchange (EDI)
- Procurement Engineering (Parts Only)

- Automated Warehousing, Storage and Retrieval System
- Sales Order Processing System
- Change Packaging
- Automatic Packaging
- Re-negotiate Supplier/Delivery Contracts
- Factory Management Systems
- Energy Management
- Minimise Factory Layout
- Production Control System
- Pre-Planned Maintenance
- Materials Requirements Planning (MRP)
- Manufacturing Resource Planning (MRPII)
- Computer Aided Production Management (CAPM)
- Desk Top Publishing System (DTP)
- On-Line Access to Operations
- Management Information System
- Business Process Simplification
- Cell Manufacturing
- Trial Kiting - Simulation
- Standardised Products
- Computer Supported Estimating and Costing
- Activity Based Costing (ABC)
- Vendor Rating Management
- Accurate Shop Floor Production Data Collection
- Kanban
- Just In Time (JIT)
- Optimised Production Technology (OPT)
- Computer Aided Process Planning (CAPP)
- Preventative Maintenance
- Accurate Capacity Data
- Accurate Delivery Time Data
- Production Control Data System
- CADCAM
- BS5750
- ISO 9000
- Yoki Poki
- Condition Based Monitoring
- Standardised Material Sizes (Raw Materials Only)
- Formal Agreement of Requirements
- Redesign Packaging Materials
- Redesign Packaging Methods
- Inventory Management
- Training
- On-Site Support Training
- Hotline Support Training
- Installation and Commissioning Training
- Warranty and Guarantee
- Modular Design
- Factory Scheduling Systems.


PROFIT by P. Larsen
Deliverable 12 - Selected Investment
Investment:

Toolkit 3.3.2.

The PROFIT CBT will check your selected investment, Deliverable 9, against your selection for the Potential for Change, if PROFIT has not identified a match either change the Investment or the Potential for Change options. The rules are listed below for those without the CBT.

RULE 101.
IF Investment is Modular Design
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 102.
IF Investment is Computer Aided Design (CAD)
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 103.
IF Investment is Packaging redesign
AND IF Sales Product DESIGN can change
OR Sales Product SUPPORT can change
THEN match is acceptable

RULE 104.
IF Investment is Design For Assembly (DFA)
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 105.
IF Investment is Design For Manufacture (DFM)
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 106.
IF Investment is Design For Test (DFT)
AND IF Sales Product DESIGN can change
OR Sales Product PRODUCTION can change
THEN match is acceptable

RULE 107.
IF Investment is Parts Database
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 108.
IF Investment is Change Materials
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 109.
IF Investment is BS5750/ISO 9000
AND IF Sales Product DESIGN can change
THEN match is acceptable

RULE 110.
IF Investment is Change Process
AND IF Sales Product PROCESS can change
THEN match is acceptable

RULE 111.
IF Investment is Process Simplification
AND IF Sales Product PROCESS can change
OR Sales Product DESIGN can change
THEN match is acceptable

RULE 112.
IF Investment is Computer Aided Process Planning (CAPP)
AND IF Sales Product PROCESS can change
OR Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 113.
IF Investment is Flexible Manufacturing System (FMS)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 114.
IF Investment is Group Technology
AND IF Sales Product PROCESS can change
OR Sales Product PRODUCTION can change
THEN match is acceptable

RULE 115.
IF Investment is Computer Numerical Control (CNC)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 116.
IF Investment is Distributed Numerical Control (DNC)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 117.
IF Investment is Cell Manufacturing
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 118.
IF Investment is Turning/Machining Centres
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 119.
IF Investment is Minimise Set Up Times
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 120.
IF Investment is Operator Inspection
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 121.
IF Investment is Automatic Tool Change
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 122.
IF Investment is Yoki Poki
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 123.
IF Investment is Operator Training for Multi-tasking/skill
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 124.
IF Investment is Flexible Assembly System
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 125.
IF Investment is Auto Insertion
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 126.
IF Investment is Operator Training
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 127.
IF Investment is Robots
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 128.
IF Investment is Dedicated Machines
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 129.
IF Investment is Trial Kitting - Simulation
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 130.
IF Investment is Job Enrichment - Operator Responsibility
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 131.
IF Investment is Automated Guided Vehicles (AGV's)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 132.
IF Investment is Continuous Improvement Monitoring
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 133.
IF Investment is Statistical Process Control (SPC)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 134.
IF Investment is Total Quality Management (TQM)
AND IF Sales Product PRODUCTION can change
OR IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 135.
IF Investment is Quality Circles
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 136.
IF Investment is Computer Aided Testing (CAT)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 137.
IF Investment is Automatic Test Equipment (ATE)
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 138.
IF Investment is Co-Ordinate Measuring Machines
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 139.
IF Investment is Preventative Maintenance
AND IF Sales Product PRODUCTION can change
THEN match is acceptable

RULE 140.
IF Investment is Vendor Rating Management
AND IF Sales Product MATERIALS MANAGEMENT can change
OR Sales Product SUPPORT can change
THEN match is acceptable

RULE 141.
IF Investment is Open Orders
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 142.
IF Investment is Re-negotiate Supplier/Delivery Contracts
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 143.
IF Investment is Reduce Scrap
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 144.
IF Investment is Reduce Waste
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 145.
IF Investment is Standardised Material Sizes (Raw Materials Only)
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 146.
IF Investment is Electronic Data Interchange (EDI)
AND IF Sales Product MATERIALS MANAGEMENT can change
OR Sales Product SUPPORT can change
OR Company Wide SUPPORT can change
OR Company Wide MANAGEMENT can change
THEN match is acceptable

RULE 147.
IF Investment is Procurement Engineering (Parts Only)
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 148.
IF Investment is Automatic Warehousing, Storage and Retrieve System
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 149.
IF Investment is Inventory Management
AND IF Sales Product MATERIALS MANAGEMENT can change
THEN match is acceptable

RULE 150.
IF Investment is Just In Time (JIT)
AND IF Sales Product MATERIALS MANAGEMENT can change
OR Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 151.
IF Investment is Kanban
AND IF Sales Product MATERIALS MANAGEMENT can change
OR Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 152.
IF Investment is Training
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 153.
IF Investment is On-Site Support Training
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 154.
IF Investment is Hotline Support Training
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 155.
IF Investment is Installation and Commissioning Training
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 156.
IF Investment is Sales Order Processing
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 157.
IF Investment is Change Packaging
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 158.
IF Investment is Automatic Packaging
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 159.
IF Investment is Re-negotiate Supplier/Delivery Contracts
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 160.
IF Investment is Formal Agreement of Requirements
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 161.
IF Investment is Computer Supported Estimating and Costing
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 162.
IF Investment is Standardised Products
AND IF Sales Product SUPPORT can change
OR Sales Product DESIGN can change
THEN match is acceptable

RULE 163.
IF Investment is Activity Based Costing (ABC)
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 164.
IF Investment is Accurate Capacity Data
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 165.
IF Investment is Accurate Delivery Time Data
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 166.
IF Investment is Production Control Data System
AND IF Sales Product SUPPORT can change
THEN match is acceptable

RULE 167.
IF Investment is Factory Management System
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 168.
IF Investment is Factory Scheduling System
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 169.
IF Investment is Energy Management
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 170.
IF Investment is Production Control System
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 171.
IF Investment is Pre-Planned Maintenance
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 172.
IF Investment is Material Requirements Planning (MRP)
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 173.
IF Investment is Manufacturing Resource Planning (MRPII)
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 174.
IF Investment is Computer Aided Production Management (CAPM)
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

RULE 175.
IF Investment is Accurate Shop Floor Production Data Collection
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

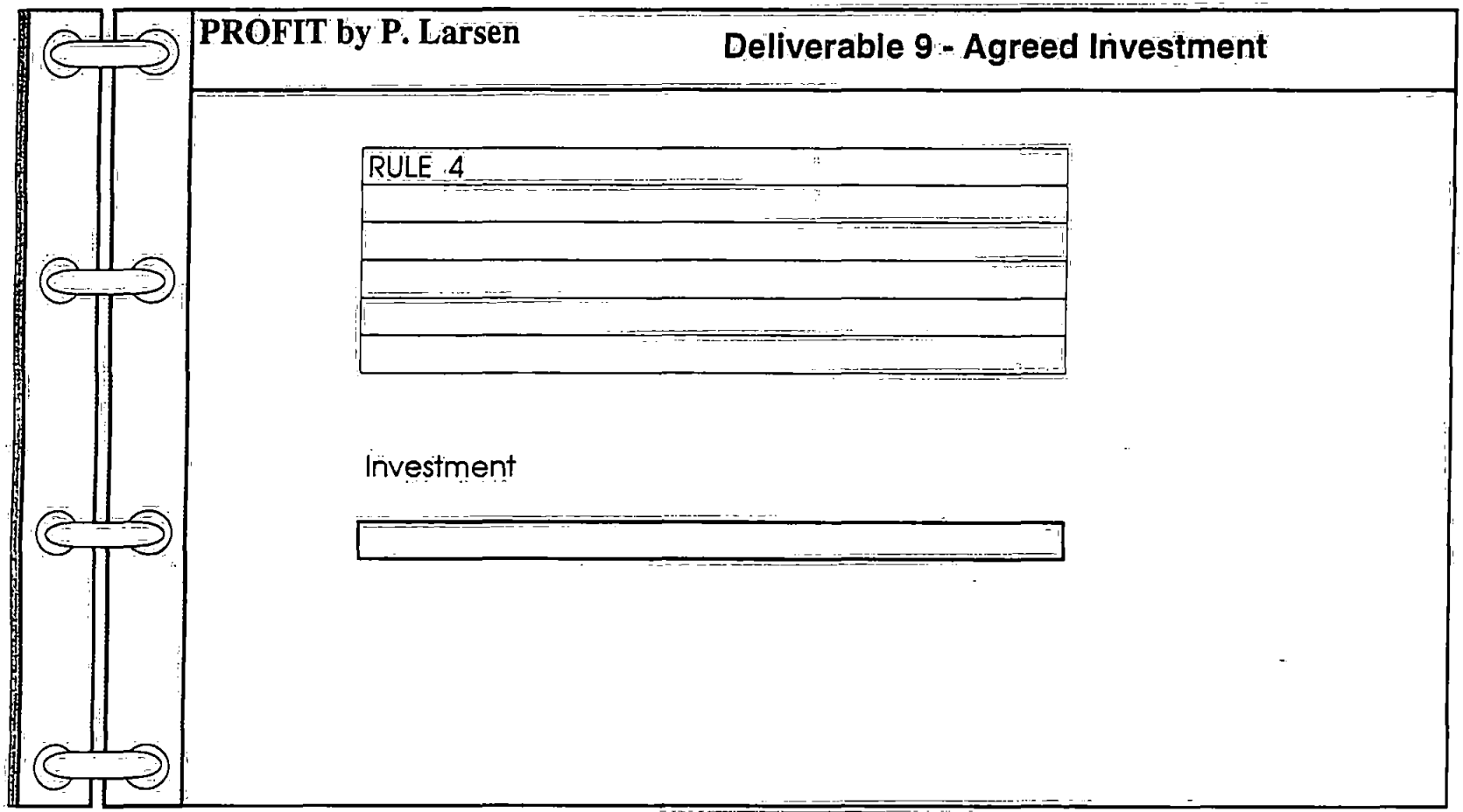
RULE 176.
IF Investment is Optimised Production Technology (OPT)
AND IF Sales Product MANAGEMENT can change
THEN match is acceptable

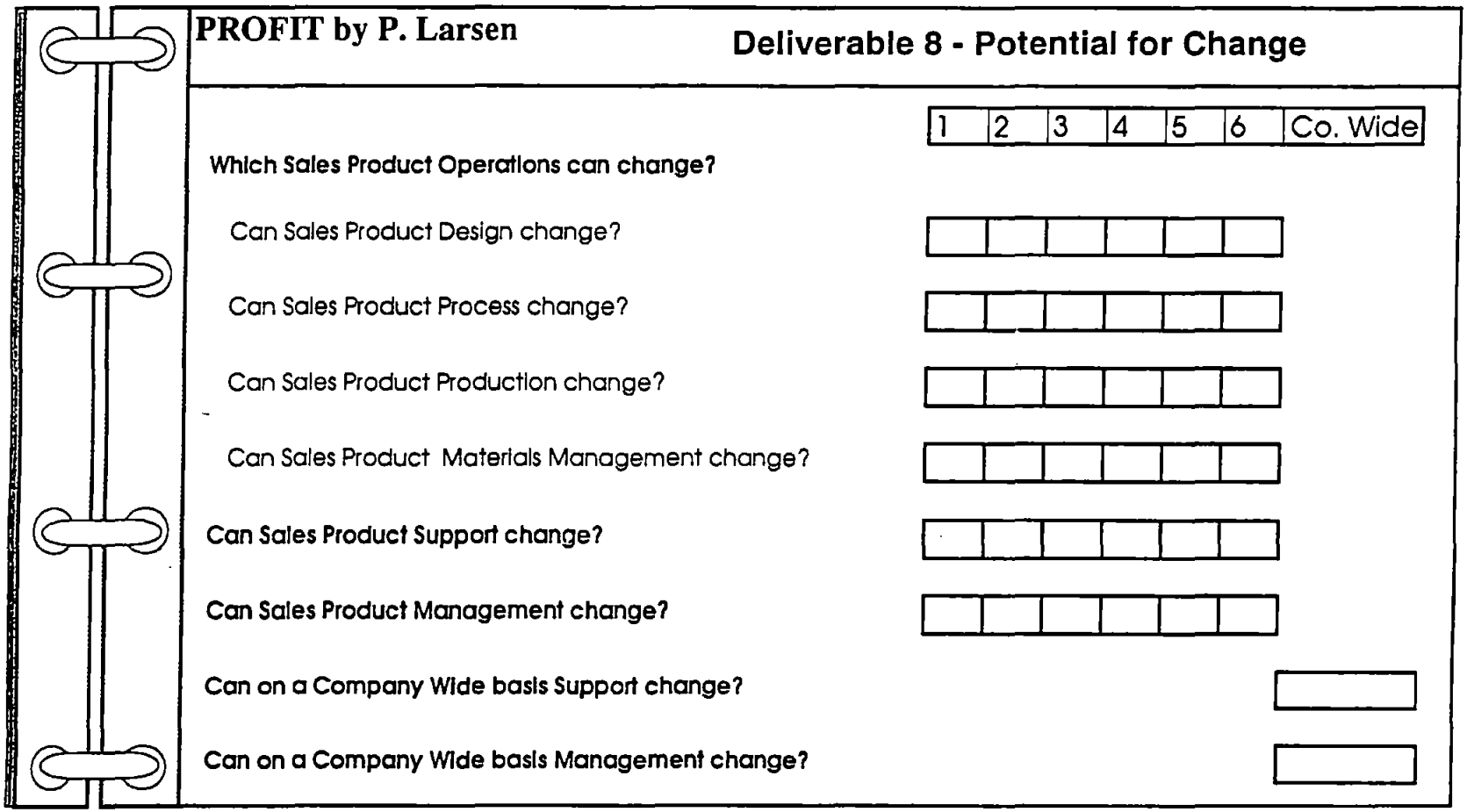
RULE 177.
IF Investment is Desk Top Publishing (DTP) System
AND IF Company Wide SUPPORT can change
THEN match is acceptable

RULE 178.
IF Investment is On-Line Access to Operations
AND IF Company Wide SUPPORT can change
THEN match is acceptable

RULE 179.
IF Investment is Management Information System
AND IF Company Wide MANAGEMENT can change
THEN match is acceptable

RULE 180.
IF Investment is Business Process Simplification
AND IF Company Wide MANAGEMENT can change
THEN match is acceptable


PROFIT by P. Larsen
Deliverable 9 - Agreed Investment
RULE 4
Investment



PROFIT by P. Larsen

Deliverable 8 - Potential for Change

	1	2	3	4	5	6	Co. Wide
Which Sales Product Operations can change?							
Can Sales Product Design change?							
Can Sales Product Process change?							
Can Sales Product Production change?							
Can Sales Product Materials Management change?							
Can Sales Product Support change?							
Can Sales Product Management change?							
Can on a Company Wide basis Support change?							
Can on a Company Wide basis Management change?							

Help Screen

Please tick a cell opposite potential for change questions for each Sales Product, or where business need is applicable on a Company Wide basis the Co. Wide cell.

Toolkit 3.3.3.

Compare the results from Deliverable 9 - Agreed Selected Investment with the Business Needs shown below:

1. Reduce Costs.
2. Reduce Lead Time.
3. Improve Delivery Performance.
4. Improve Product Quality.
5. Improve Customer Service.
6. Improve Functionality and Features.
7. Increase Capacity.

(Toolkit 3.2.3 provides a description of each of the Business Needs)

Complete Deliverable 7 Agreed Business Need.

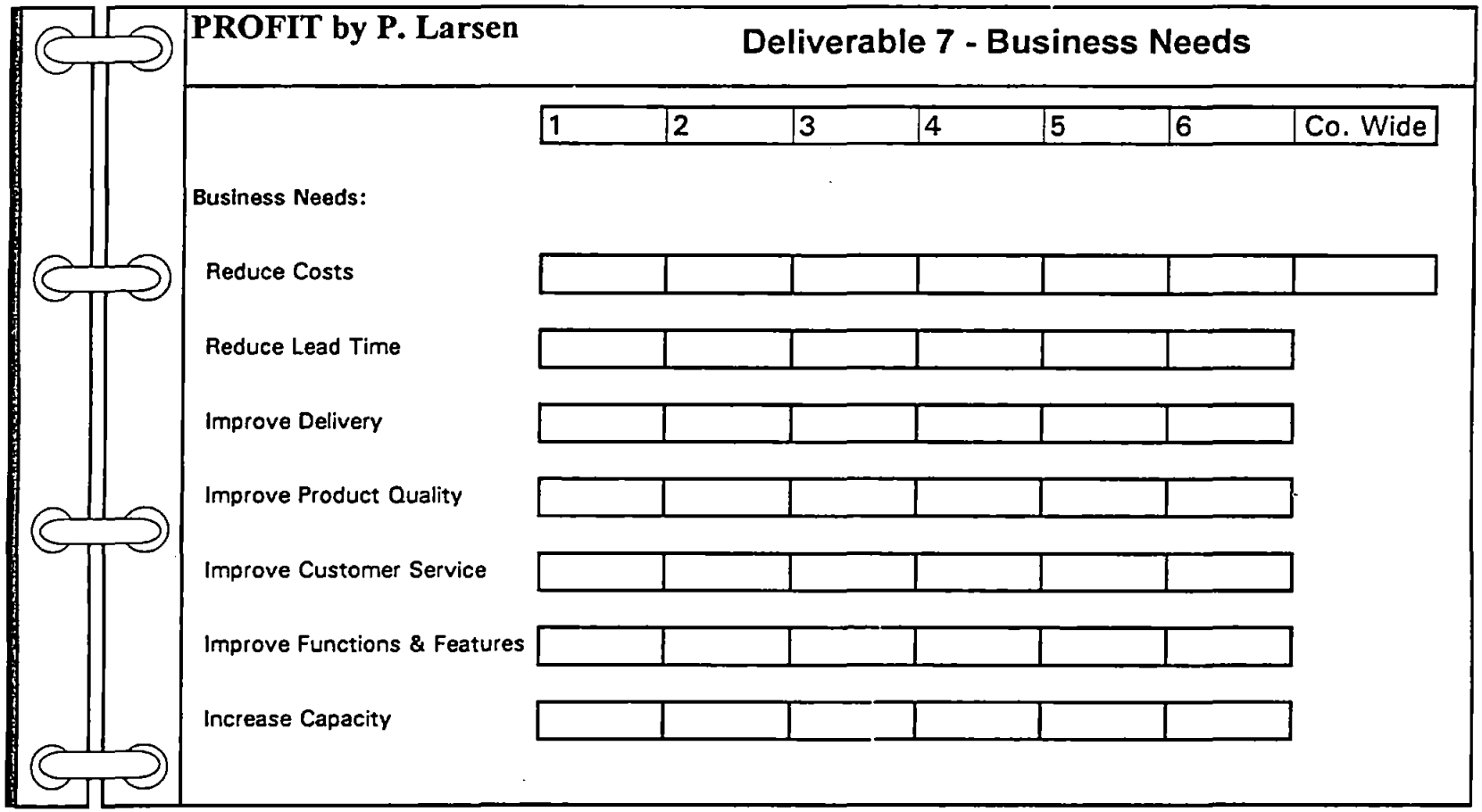
Then identify using Toolkit 3.2.4 the possible benefits of the investment. With the CBT this is generated automatically.

Print off or copy the benefits onto Deliverable 10.

The Workshop concludes with copies of the benefits being sent out to those responsible for the processes where the benefits will be seen, (use Pro-forma 13) so that they can calculate the value of the benefits for discussion in Workshop 4.

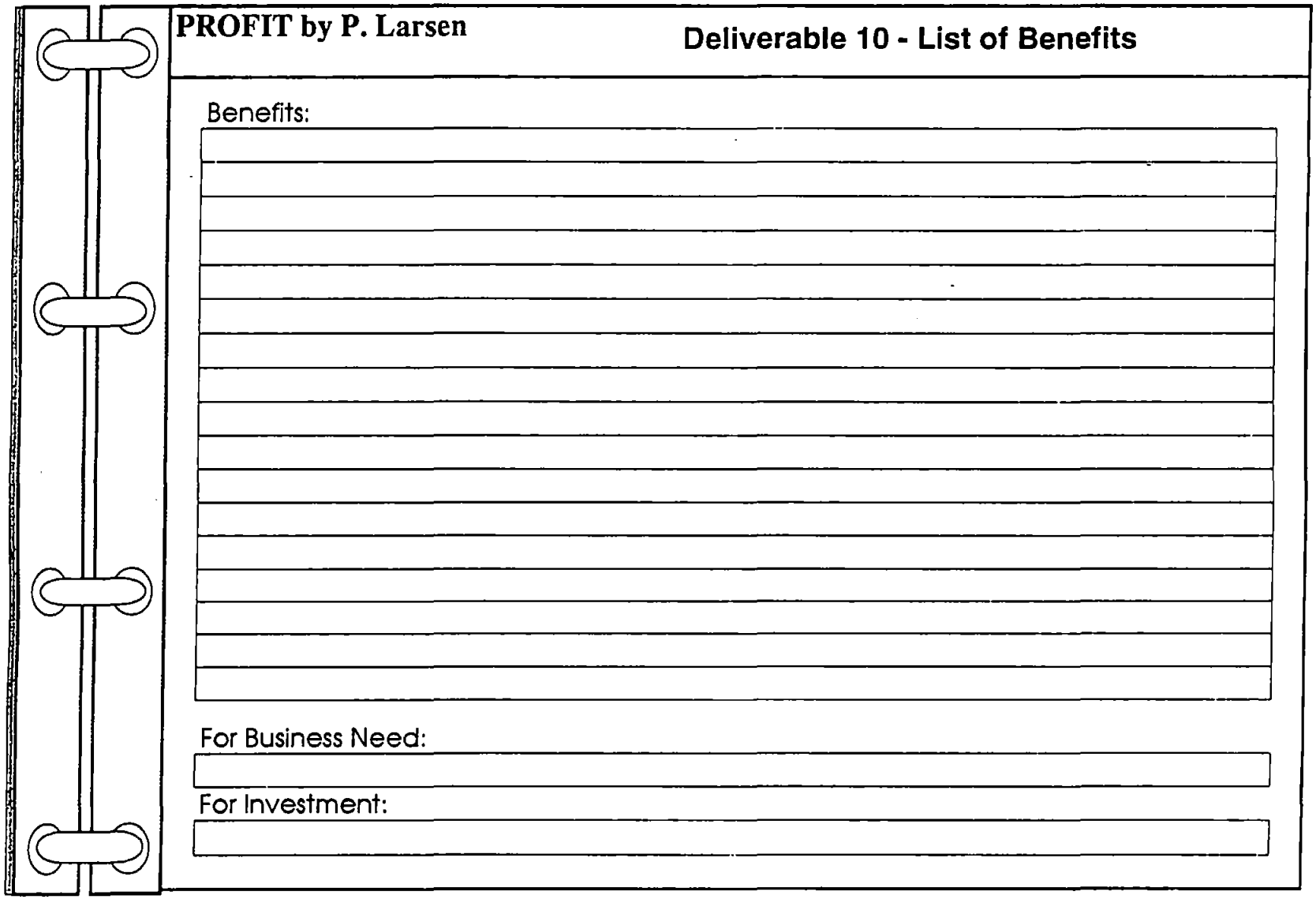
Print off or copy Deliverable 11.

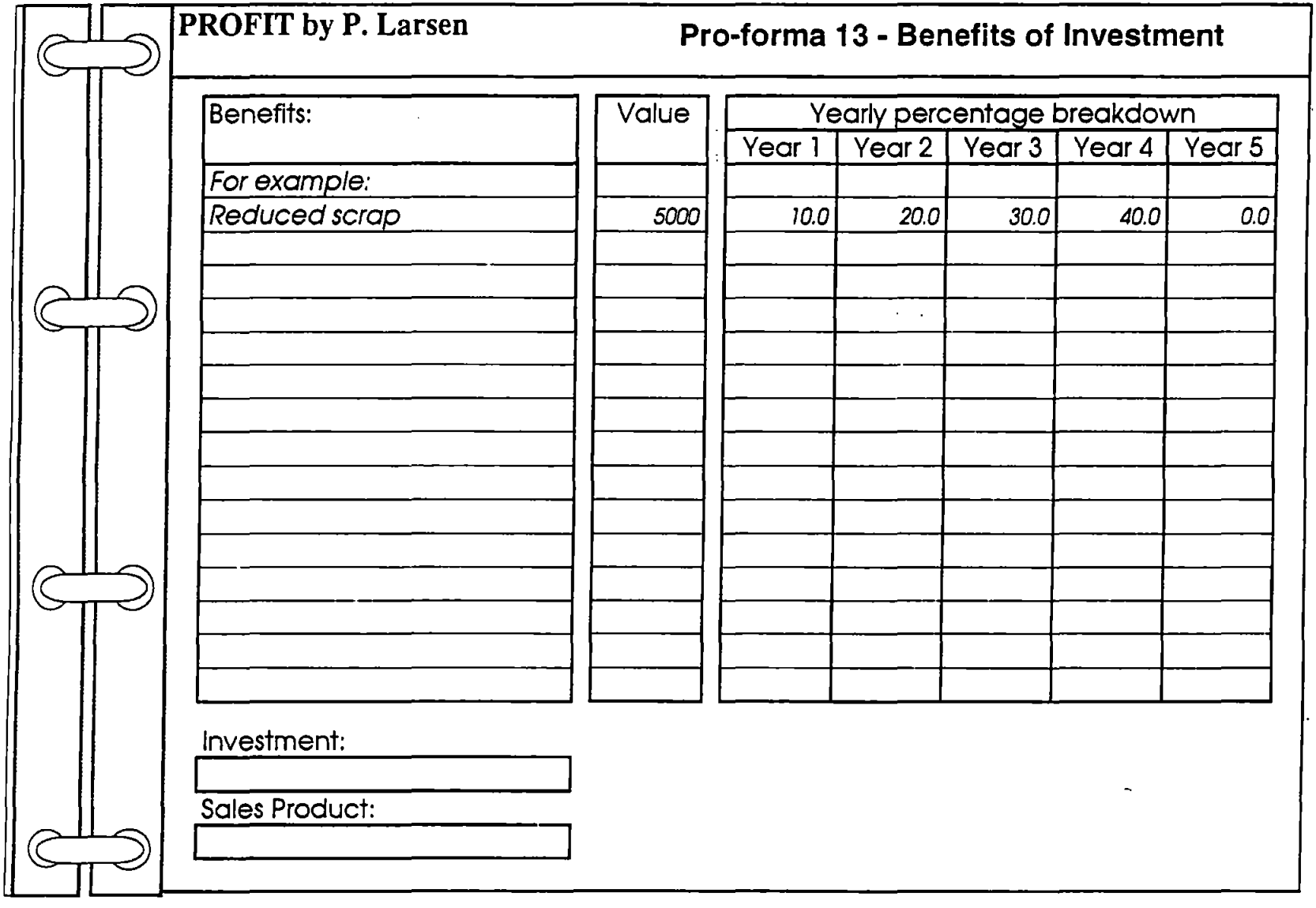
The details of the investment are also sent out (use Pro-forma 14) to possible vendors to obtain quotes regarding costs and time periods involved in any implementation for discussion in Workshop 4. The information from the vendors is entered on Pro-forma 14 and should include the cost of the investment, the investment period and interest rate applicable.



Help Screen

Please tick **one** cell opposite business need for each Sales Product, or where business need is applicable on a Company Wide basis the Co. Wide cell.


PROFIT by P. Larsen
Deliverable 10 - List of Benefits
Benefits:
For Business Need:
For Investment:



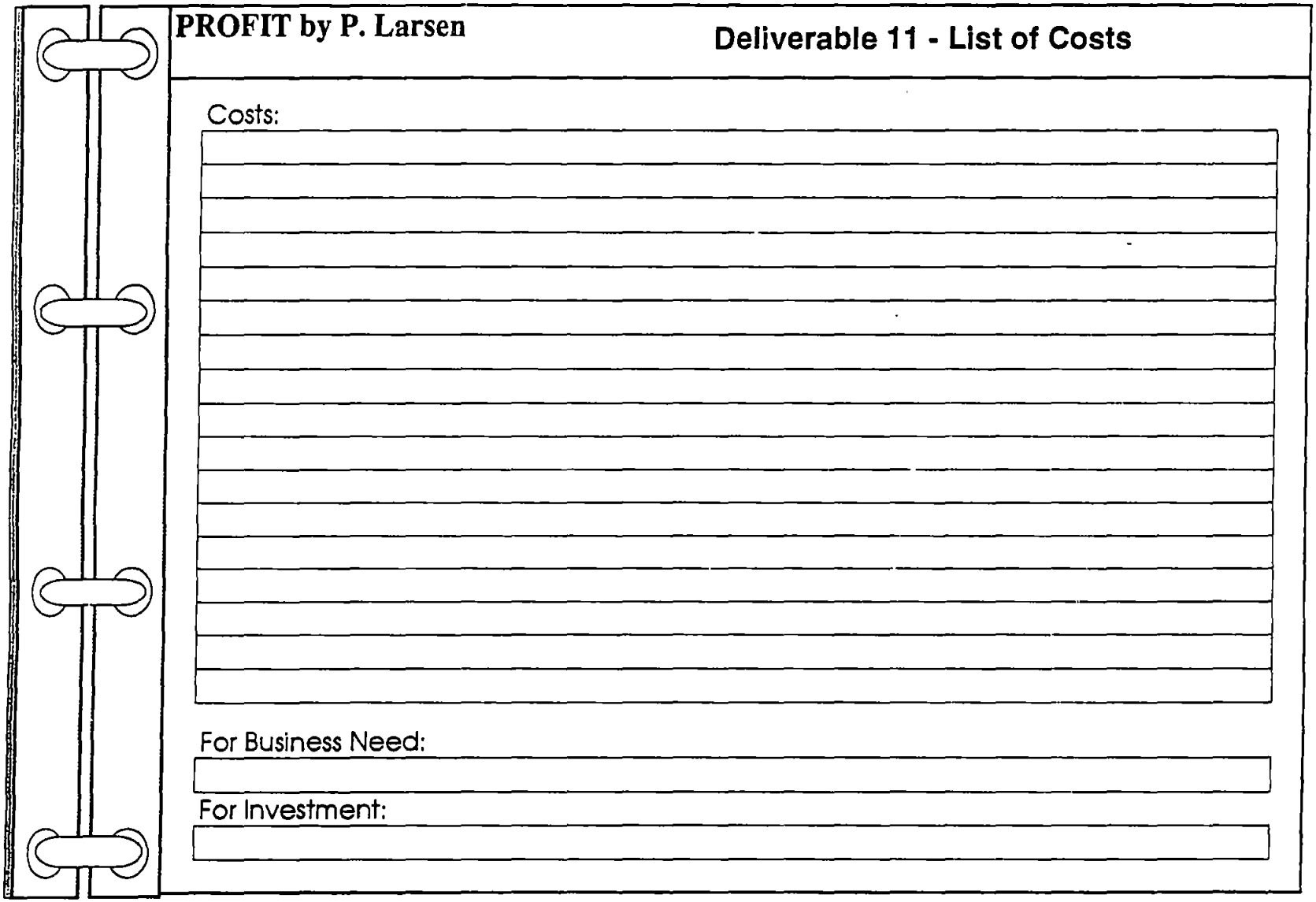
PROFIT by P. Larsen

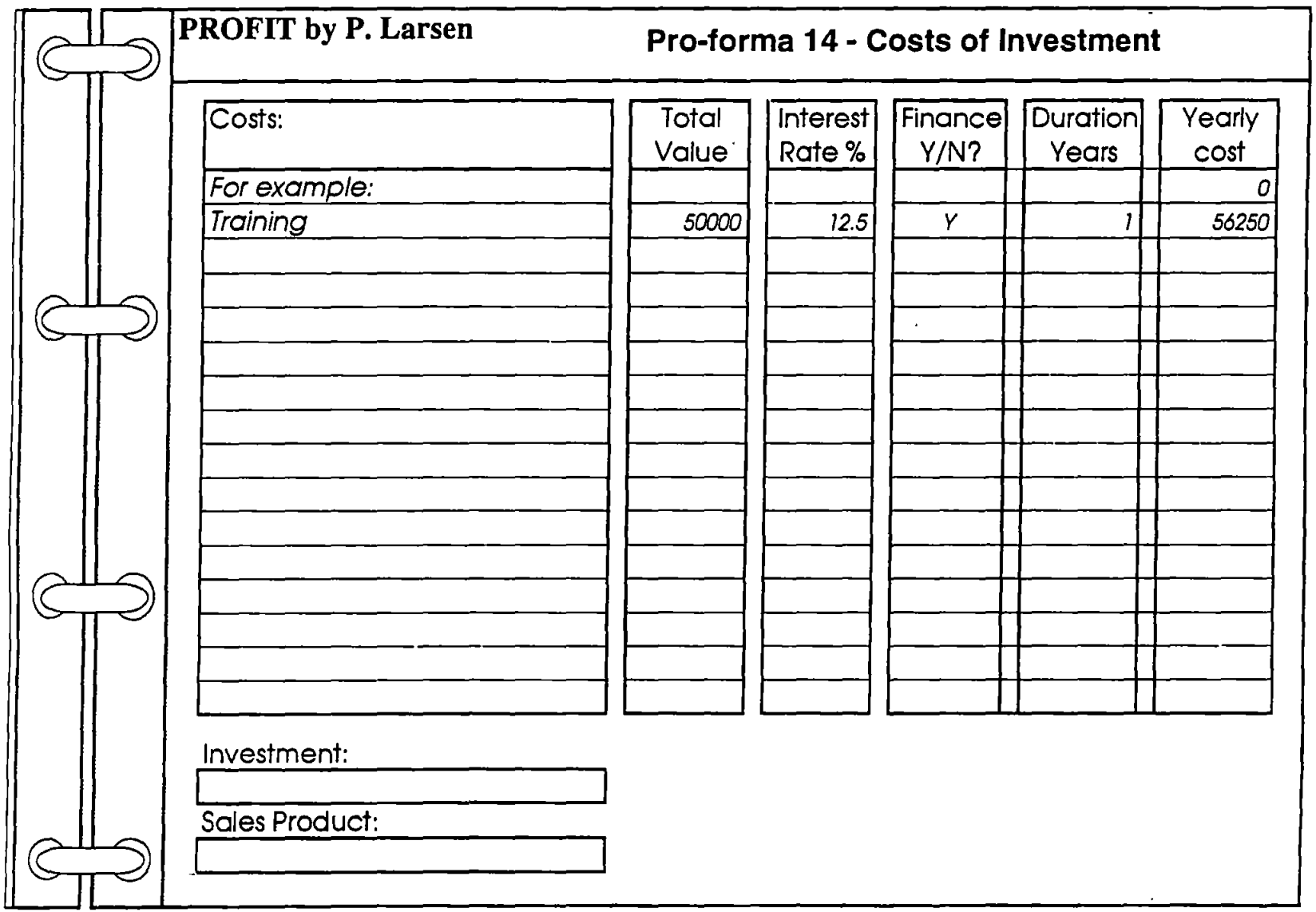
Pro-forma 13 - Benefits of Investment

Benefits:	Value	Yearly percentage breakdown				
		Year 1	Year 2	Year 3	Year 4	Year 5
For example:						
Reduced scrap	*5000*	*10.0*	*20.0*	*30.0*	*40.0*	*0.0*

Investment:

Sales Product:


PROFIT by P. Larsen
Deliverable 11 - List of Costs
Costs:
For Business Need:
For Investment:



PROFIT by P. Larsen

Pro-forma 14 - Costs of Investment

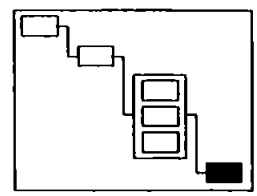
Costs:	Total Value	Interest Rate %	Finance Y/N?	Duration Years	Yearly cost
For example:					*0*
Training	*50000*	*12.5*	*Y*	*1*	*56250*

Investment:

Sales Product:

Stage Four - Financial Justification

Workshop 4



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Production, Personnel and Sales.

Rationale:

Before Workshop 4 begins the PROFIT Manager must insure that Deliverable 10 and 11 have been completed.

Workshop 4 then begins with the Steering Committee discussing the benefits, specified in Deliverables 10 and 11 and the value of the benefits and costs from Pro-formas 13 and 14. Toolkit 4 provides assistance.

When the Steering Committee are confident they have reached agreement on the value of all the benefits and costs, Deliverable 13 - Agreed Value of Benefits and Deliverable 14 - Agreed Value of Costs are completed.

Actions Required:

Tasks:

Discuss Deliverable 10 - List of Benefits and Pro-forma 13 - Value of Benefits

Discuss Deliverable 11 - List of Costs and Pro-forma 14 - Value of Costs.

Complete

Deliverable 13 - Agreed Value of Benefits.

Deliverable 14 - Agreed Value of Costs.

Toolkit 4

To assist in the quantification of benefits, RULE 5. is used as an example:

RULE 5.
Benefits for Reduced Cost
MARKETING
Sales Order Processing System
Reduce number of sales order processing personnel.
Avoid recruiting additional sales order personnel.
Reduce time spent processing sales orders.
Reduce number of forms and documentation.
Improved accuracy.

The methods that can be used to quantify the benefits are shown below:

Reduce number of sales order processing personnel.

> How many people work in sales order processing?
> Can we see a reduction in staff?
> How much would we save?

Avoid recruiting additional sales order personnel.

> How many additional staff would be needed to improve the sales order processing IF we do not invest?
> What would that cost us?

Reduce time spent processing sales orders.

> How long does it take to process a sales order?
> What does that cost us?
> How much faster would the new investment be?
> What savings can we expect?

Reduce number of forms and documentation.

> What do we spend on forms and documentation?
> How much can we save with the new investment?

Improved accuracy.

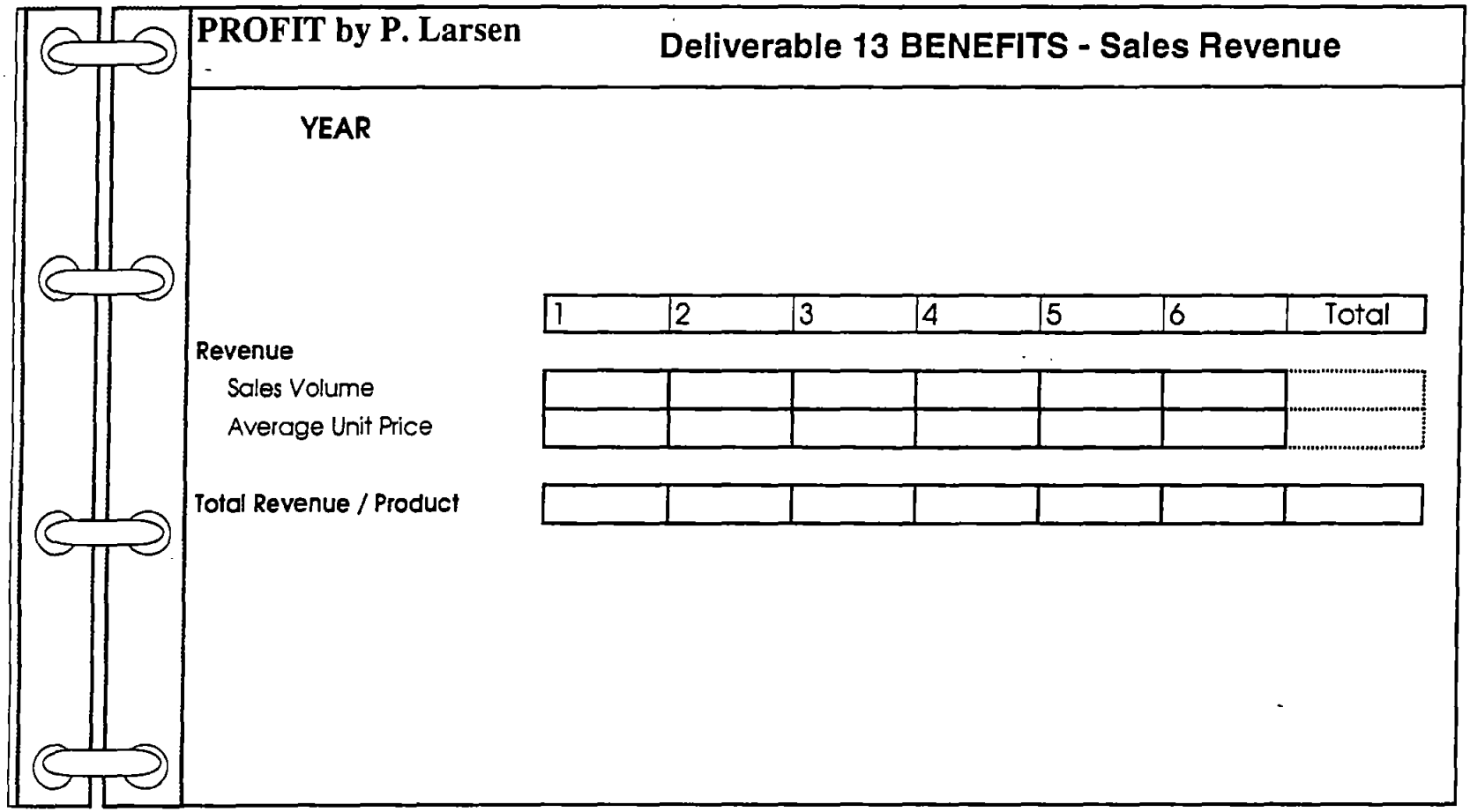
How much do mistakes cost us at present?
How many dissatisfied customers take their business elsewhere?
How much does that cost us?
How much time is spent following up incorrect orders?
How much does that cost us?
How much time is spent by Sales and Marketing reassuring customers regarding inaccuracies in sales orders?
How much does that cost us?

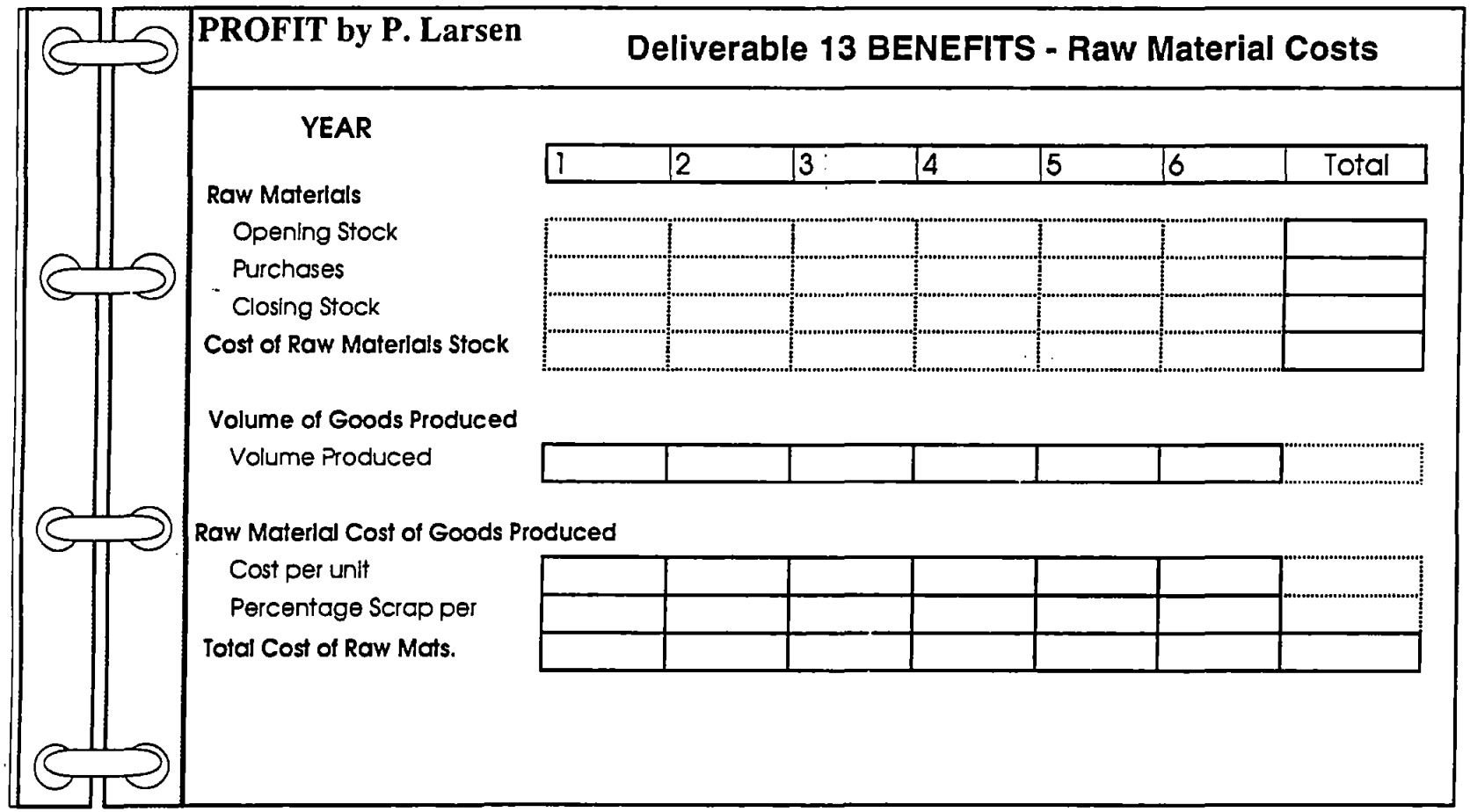
The quantification of the costs involved in the new investment will be dictated to a large degree by the response from the vendors.

Where the investment relates to a change in materials or processes, for example, costs will relate to disruption, lost production, loss of raw material and bought out parts inventory, redesigning of products, new material requirement orders, new storage requirements, etc.

To complete Deliverable 13 - Agreed Benefits, requires placing a value in the cells that represents the expected estimated improvement or change to the current financial status of the Company as shown in Workshop 2.

To complete Deliverable 14 - Agreed costs, requires placing a value in the cells that represents the expected estimated cost or change to the current financial status of the Company as shown in Workshop 2.


PROFIT by P. Larsen
Deliverable 13 BENEFITS - Sales Revenue
YEAR
1
2
3
4
5
6
Total
Revenue
Sales Volume
Average Unit Price
Total Revenue / Product

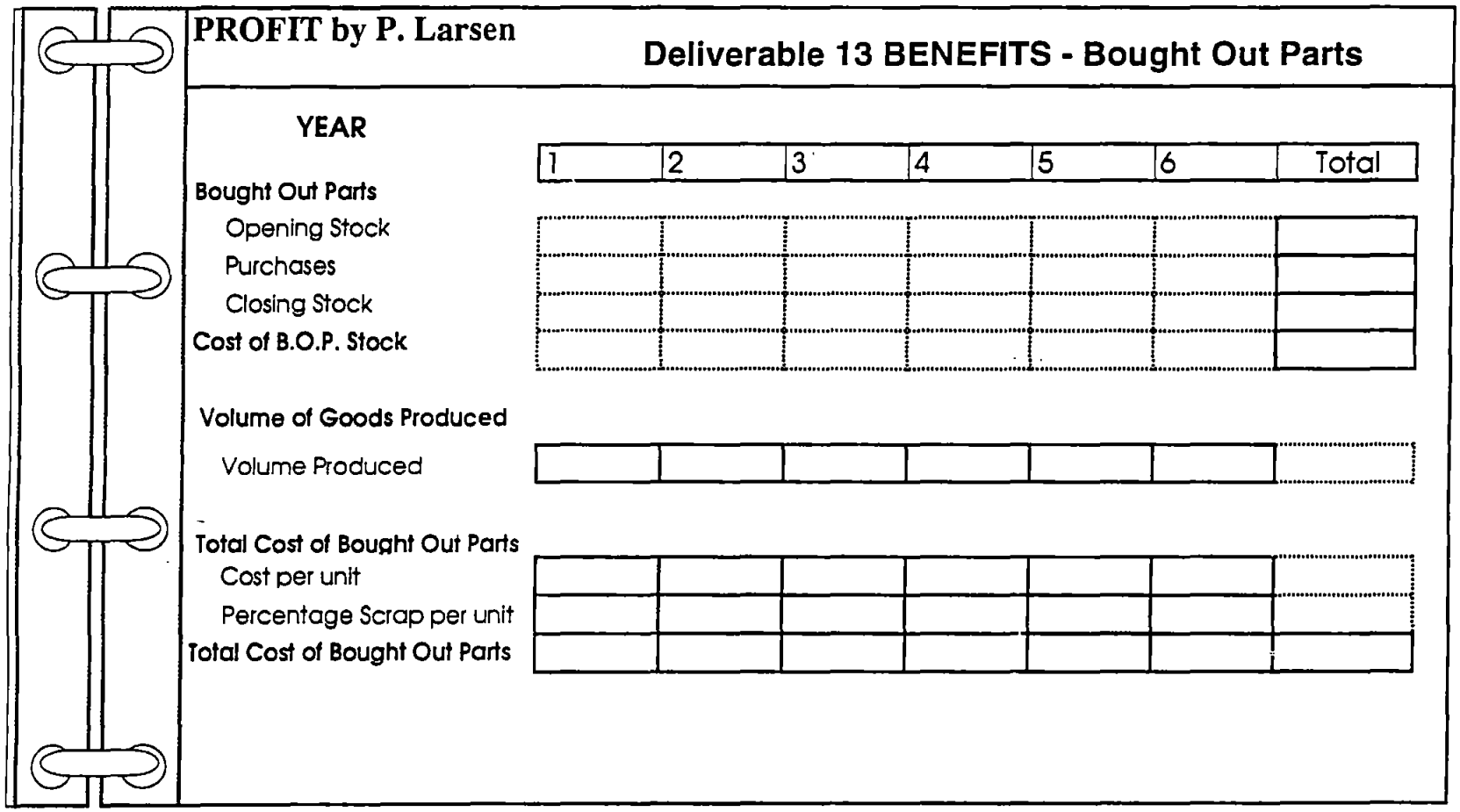


PROFIT by P. Larsen

Deliverable 13 BENEFITS - Raw Material Costs

YEAR

	1	2	3	4	5	6	Total
Raw Materials							
Opening Stock							
Purchases							
Closing Stock							
Cost of Raw Materials Stock							
Volume of Goods Produced							
Volume Produced							
Raw Material Cost of Goods Produced							
Cost per unit							
Percentage Scrap per							
Total Cost of Raw Mats.							

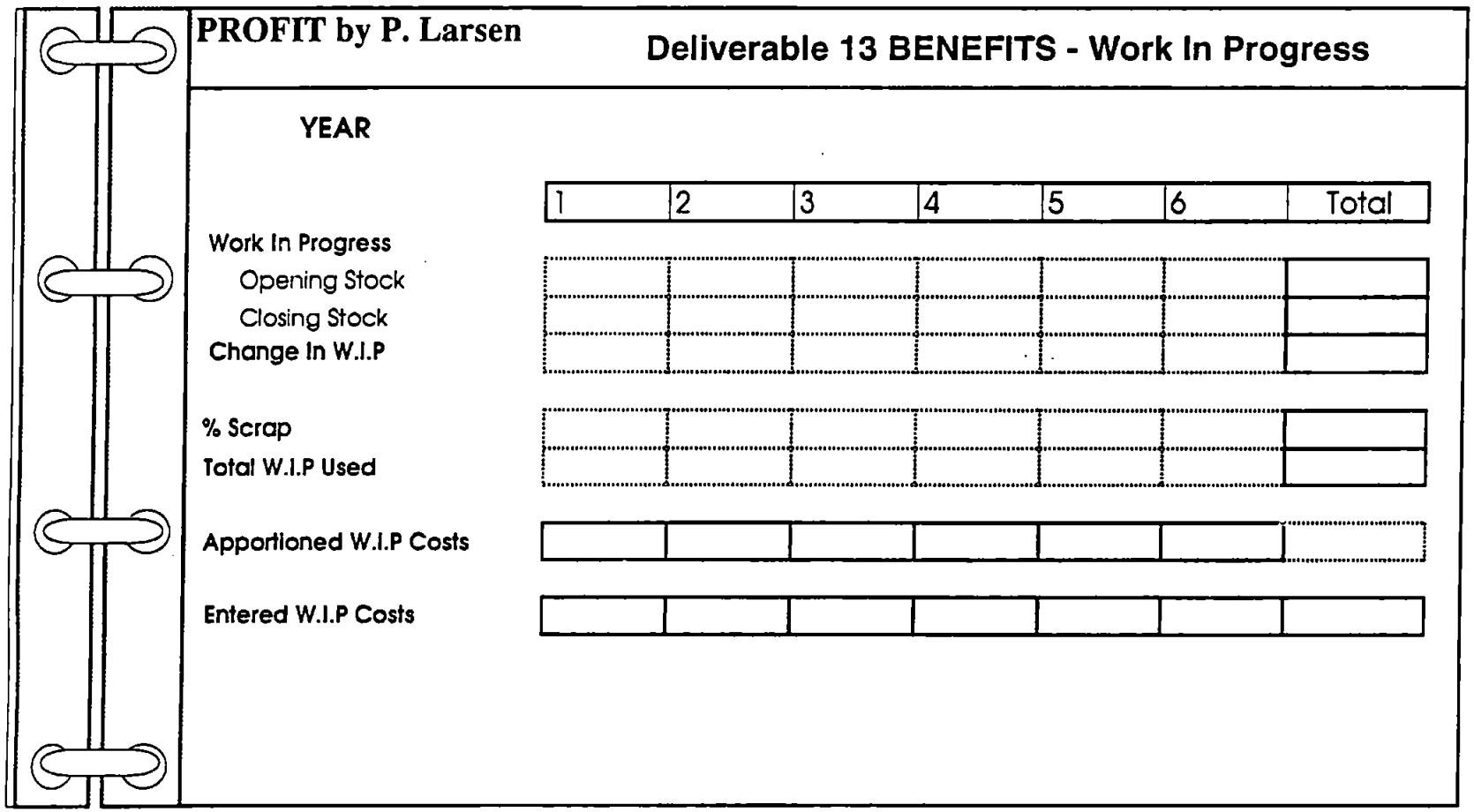


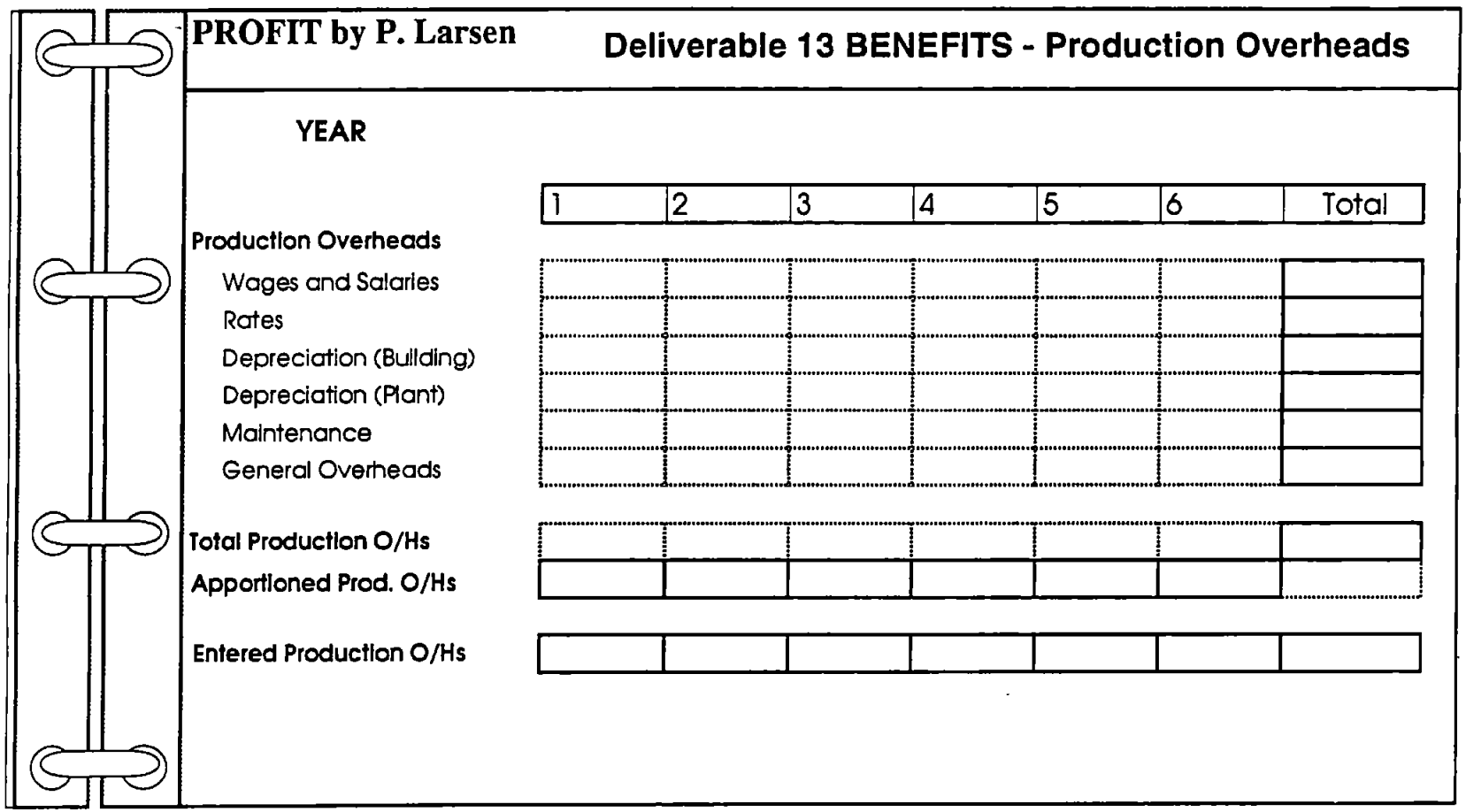
PROFIT by P. Larsen

Deliverable 13 BENEFITS - Bought Out Parts

YEAR

	1	2	3	4	5	6	Total
Bought Out Parts							
Opening Stock							
Purchases							
Closing Stock							
Cost of B.O.P. Stock							
Volume of Goods Produced							
Volume Produced							
Total Cost of Bought Out Parts							
Cost per unit							
Percentage Scrap per unit							
Total Cost of Bought Out Parts							


PROFIT by P. Larsen
Deliverable 13 BENEFITS - Work In Progress
YEAR
1
2
3
4
5
6
Total
Work In Progress
Opening Stock
Closing Stock
Change In W.I.P
% Scrap
Total W.I.P Used
Apportioned W.I.P Costs
Entered W.I.P Costs

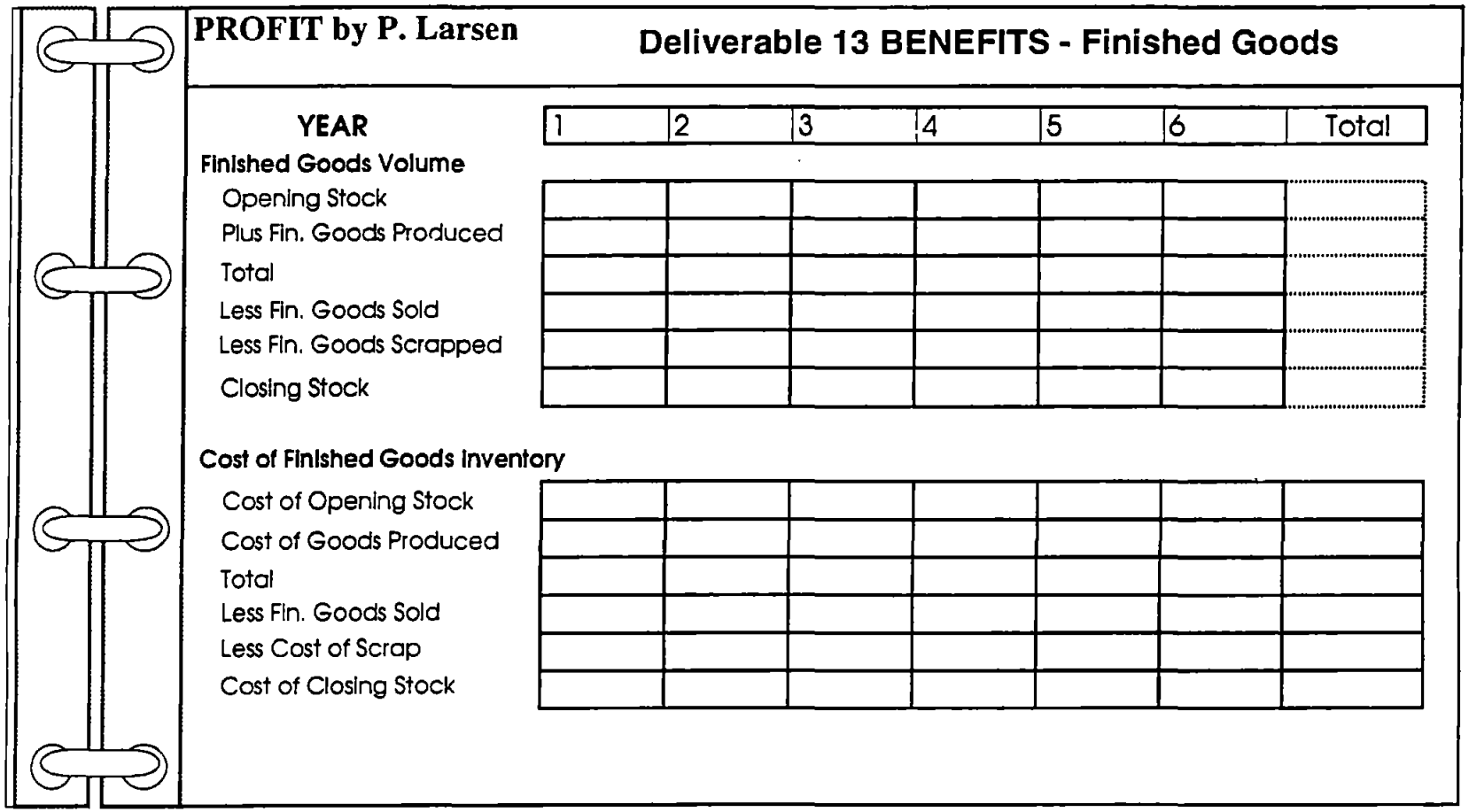


PROFIT by P. Larsen

Deliverable 13 BENEFITS - Production Overheads

YEAR

	1	2	3	4	5	6	Total
Production Overheads							
Wages and Salaries							
Rates							
Depreciation (Building)							
Depreciation (Plant)							
Maintenance							
General Overheads							
Total Production O/Hs							
Apportioned Prod. O/Hs							
Entered Production O/Hs							

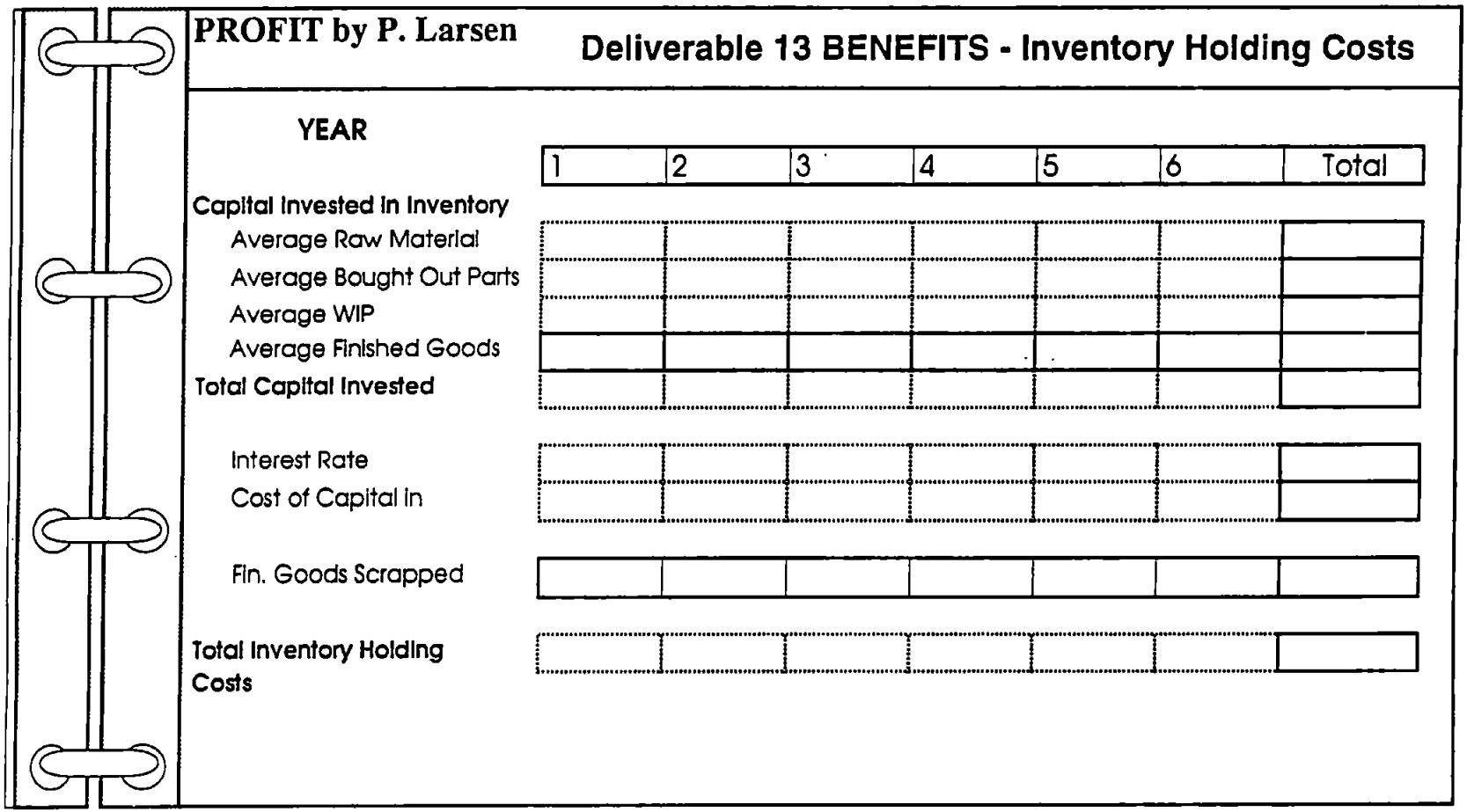


PROFIT by P. Larsen

Deliverable 13 BENEFITS - Finished Goods

YEAR	1	2	3	4	5	6	Total
Finished Goods Volume							
Opening Stock							
Plus Fin. Goods Produced							
Total							
Less Fin. Goods Sold							
Less Fin. Goods Scrapped							
Closing Stock							

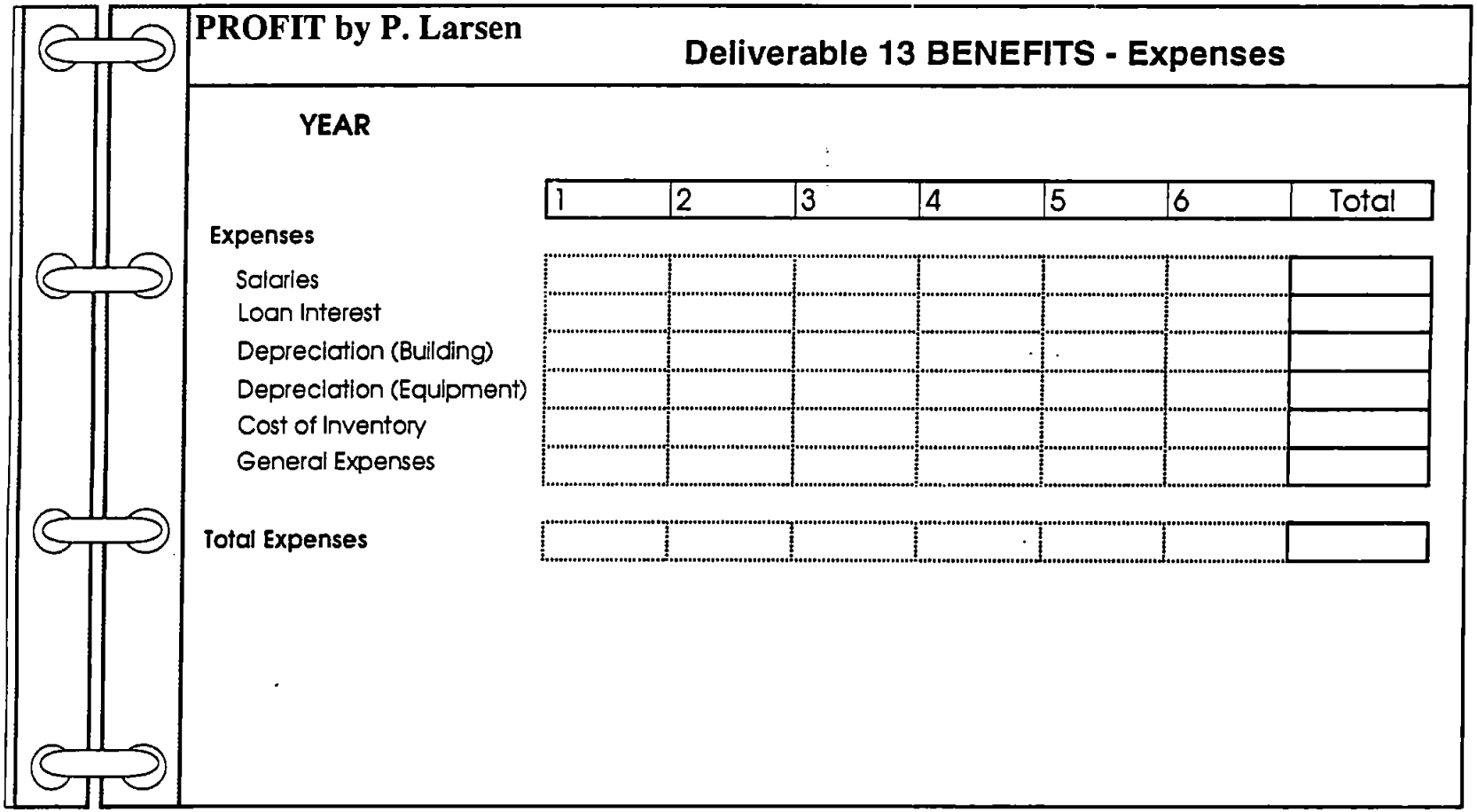
Cost of Finished Goods Inventory							
Cost of Opening Stock							
Cost of Goods Produced							
Total							
Less Fin. Goods Sold							
Less Cost of Scrap							
Cost of Closing Stock							



PROFIT by P. Larsen

Deliverable 13 BENEFITS - Inventory Holding Costs

YEAR	1	2	3	4	5	6	Total
Capital Invested in Inventory							
Average Raw Material							
Average Bought Out Parts							
Average WIP							
Average Finished Goods							
Total Capital Invested							
Interest Rate							
Cost of Capital in							
Fin. Goods Scrapped							
Total Inventory Holding Costs							

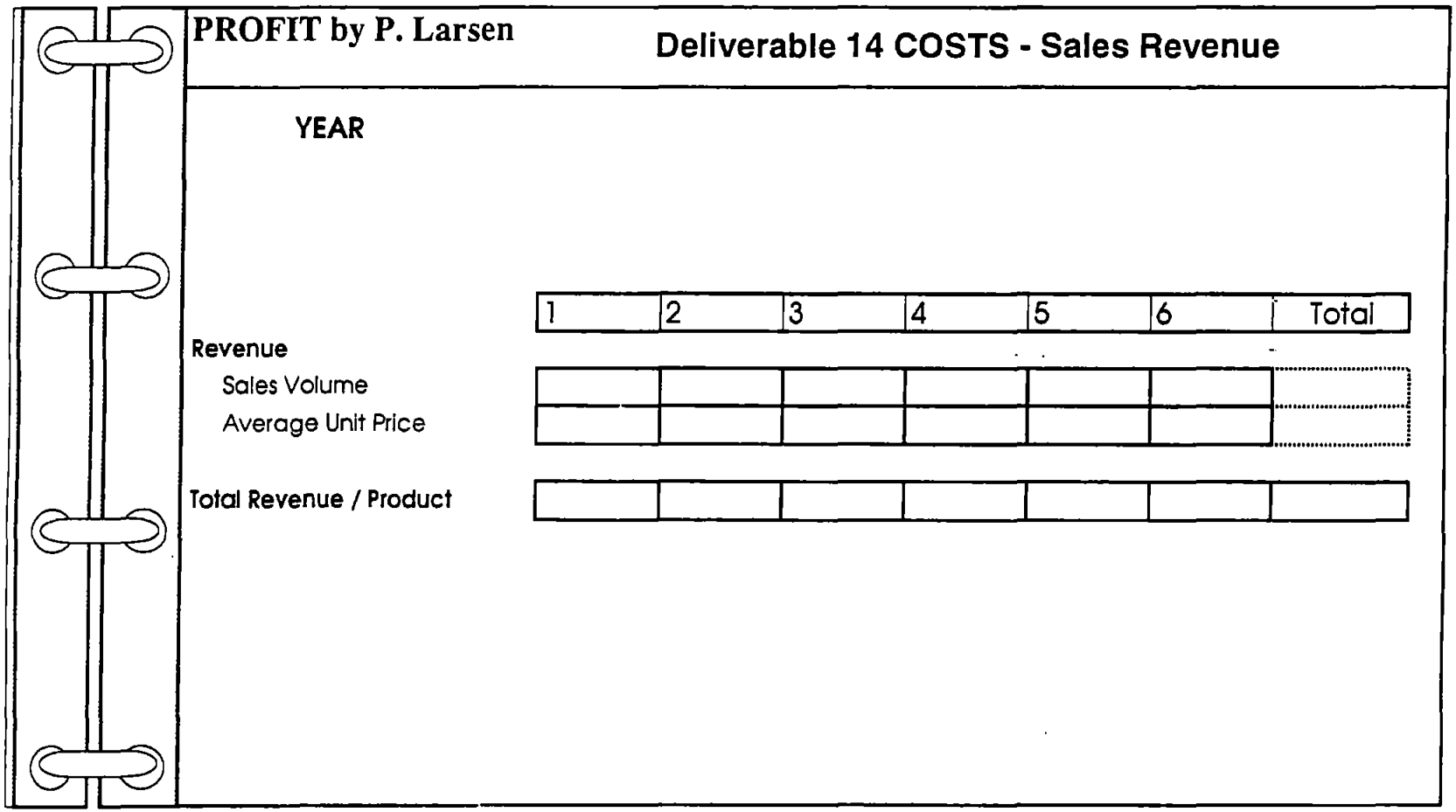


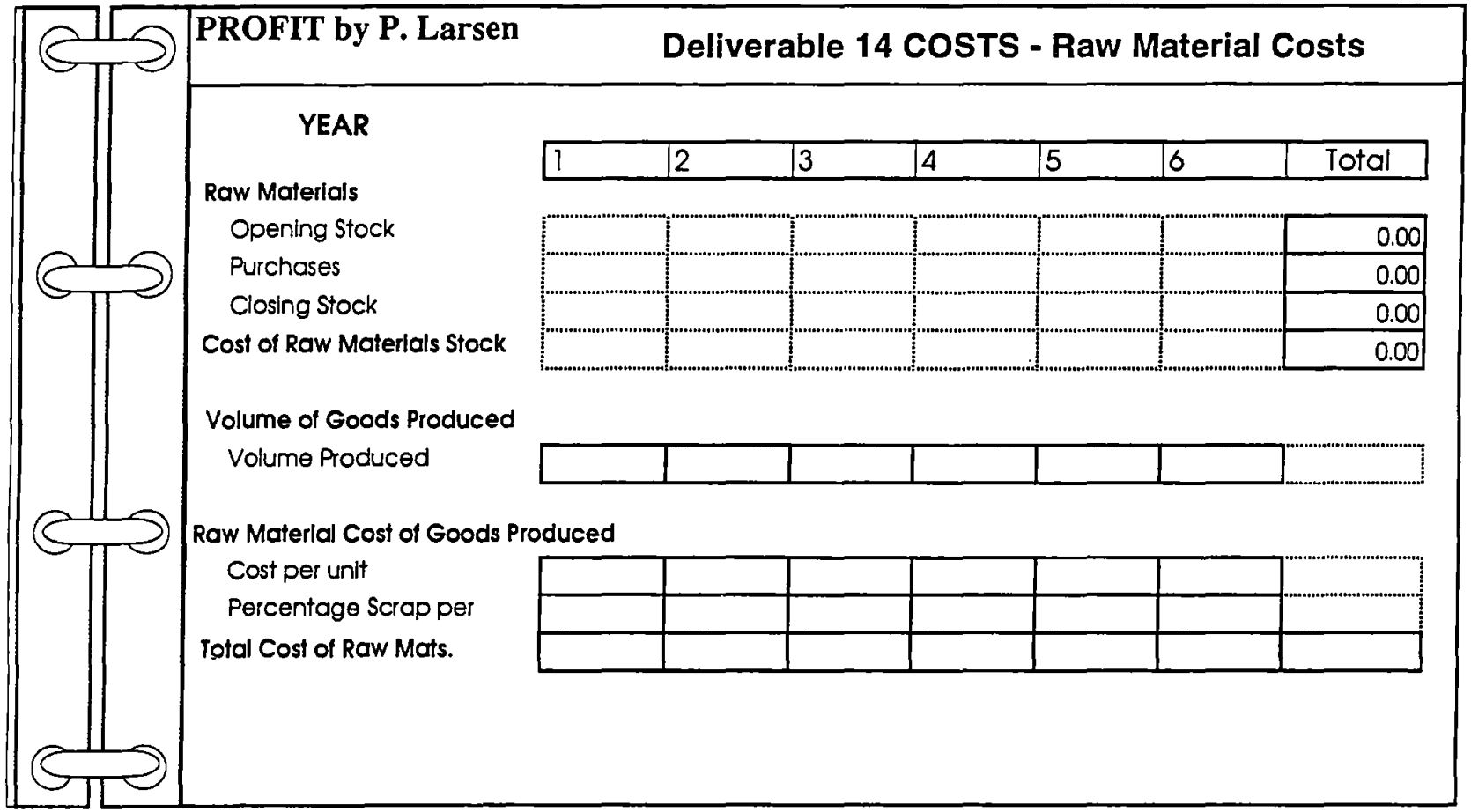
PROFIT by P. Larsen

Deliverable 13 BENEFITS - Expenses

YEAR

	1	2	3	4	5	6	Total
Expenses							
Salaries							
Loan Interest							
Depreciation (Building)							
Depreciation (Equipment)							
Cost of Inventory							
General Expenses							
Total Expenses							


PROFIT by P. Larsen
Deliverable 14 COSTS - Sales Revenue
YEAR
1
2
3
4
5
6
Total
Revenue
Sales Volume
Average Unit Price
Total Revenue / Product

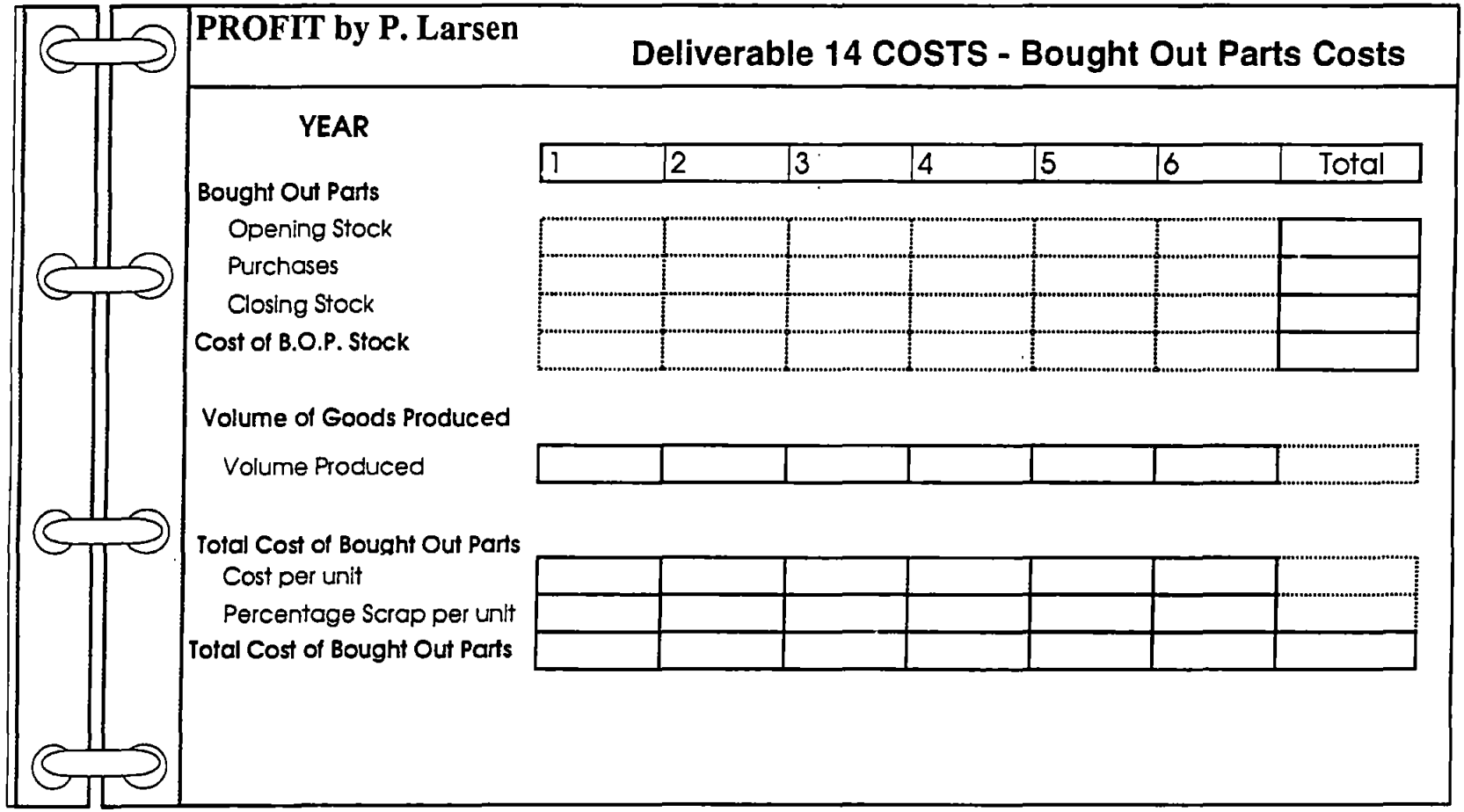


PROFIT by P. Larsen

Deliverable 14 COSTS - Raw Material Costs

YEAR

	1	2	3	4	5	6	Total
Raw Materials							
Opening Stock							0.00
Purchases							0.00
Closing Stock							0.00
Cost of Raw Materials Stock							0.00
Volume of Goods Produced							
Volume Produced							
Raw Material Cost of Goods Produced							
Cost per unit							
Percentage Scrap per							
Total Cost of Raw Mats.							

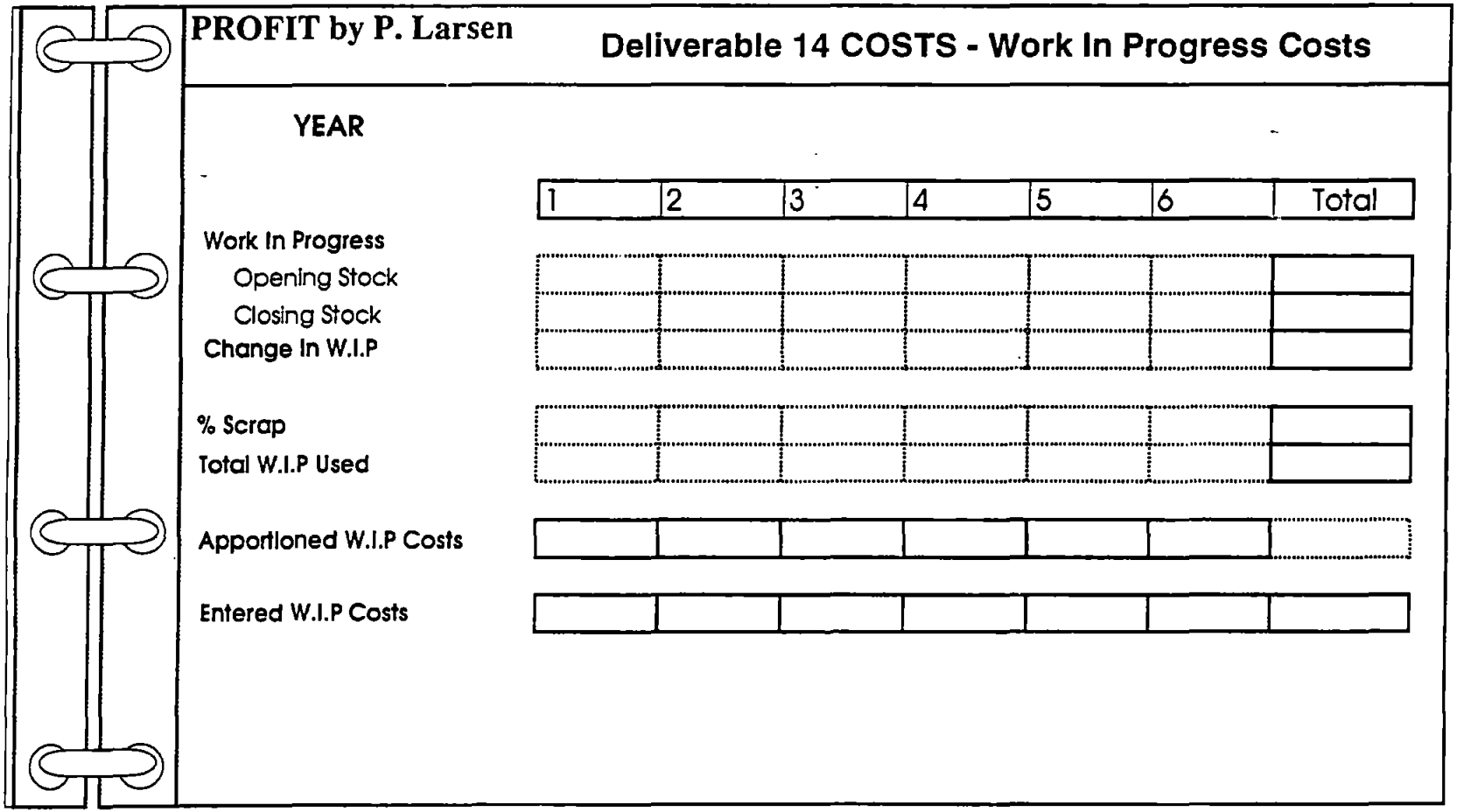


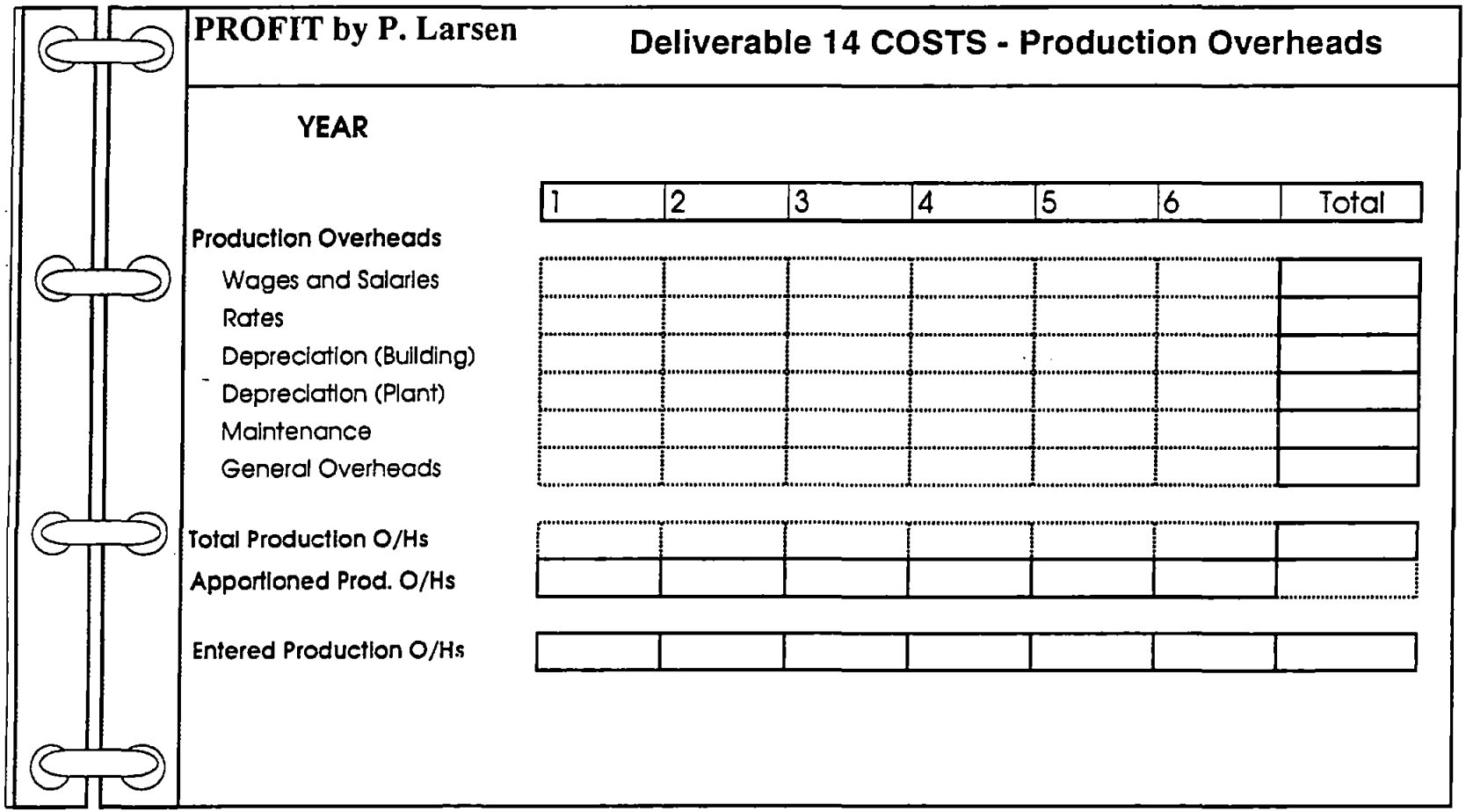
PROFIT by P. Larsen

Deliverable 14 COSTS - Bought Out Parts Costs

YEAR

	1	2	3	4	5	6	Total
Bought Out Parts							
Opening Stock							
Purchases							
Closing Stock							
Cost of B.O.P. Stock							
Volume of Goods Produced							
Volume Produced							
Total Cost of Bought Out Parts							
Cost per unit							
Percentage Scrap per unit							
Total Cost of Bought Out Parts							


PROFIT by P. Larsen
Deliverable 14 COSTS - Work In Progress Costs
YEAR
1
2
3
4
5
6
Total
Work In Progress
Opening Stock
Closing Stock
Change In W.I.P
% Scrap
Total W.I.P Used
Apportioned W.I.P Costs
Entered W.I.P Costs

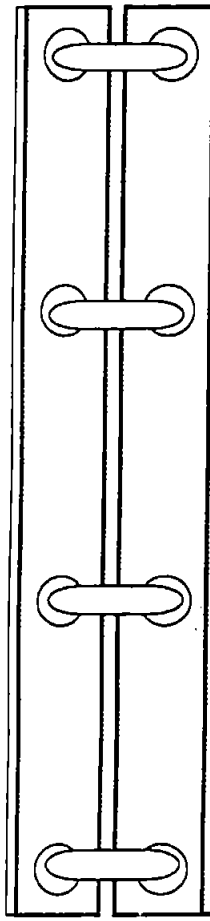


PROFIT by P. Larsen

Deliverable 14 COSTS - Production Overheads

YEAR

	1	2	3	4	5	6	Total
Production Overheads							
Wages and Salaries							
Rates							
Depreciation (Building)							
Depreciation (Plant)							
Maintenance							
General Overheads							
Total Production O/Hs							
Apportioned Prod. O/Hs							
Entered Production O/Hs							

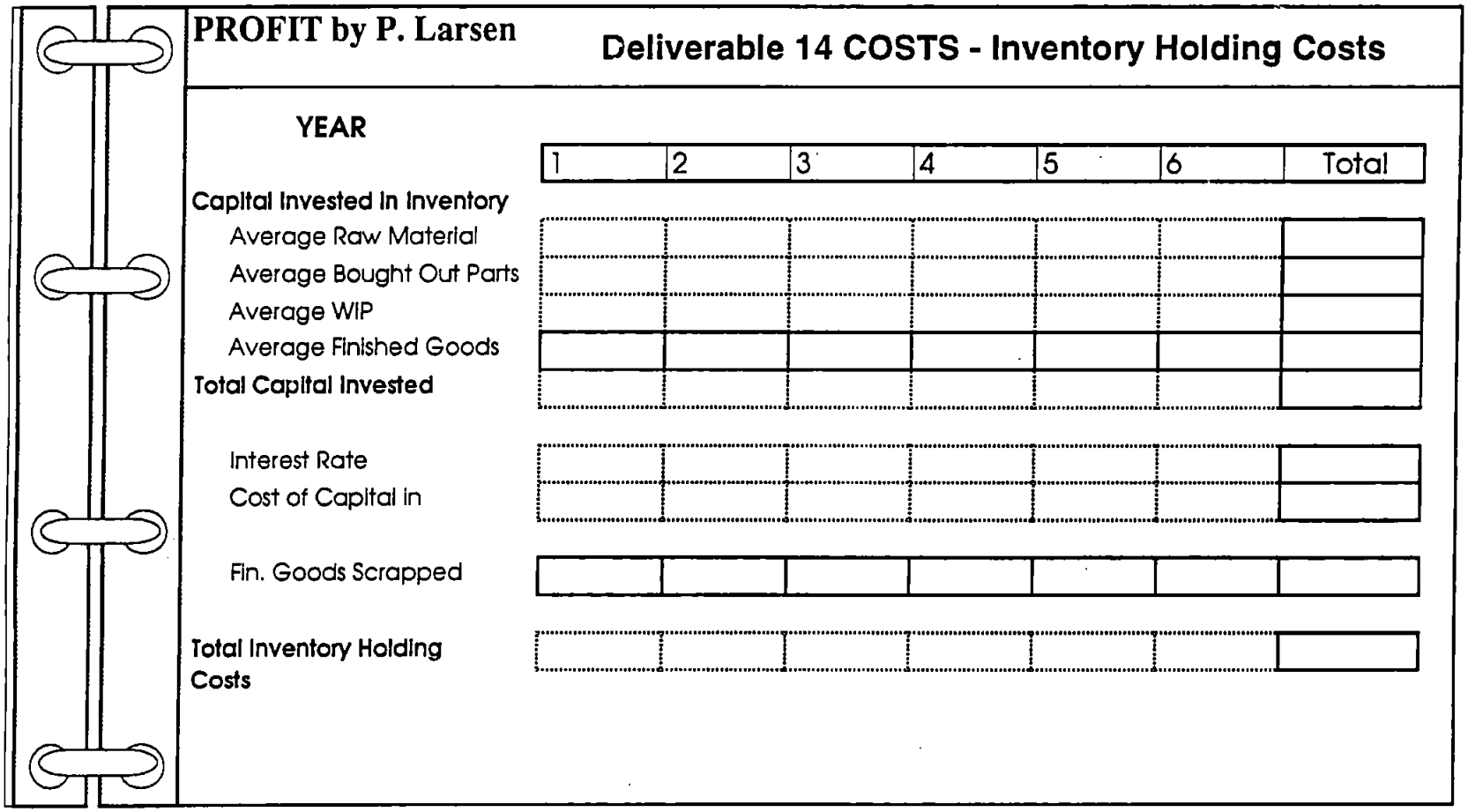


PROFIT by P. Larsen

Deliverable 14 COSTS - Finished Goods Inventory

YEAR	1	2	3	4	5	6	Total
Finished Goods Volume							
Opening Stock							
Plus Fin. Goods Produced							
Total							
Less Fin. Goods Sold							
Less Fin. Goods Scrapped							
Closing Stock							

Cost of Finished Goods Inventory							
Cost of Opening Stock							
Cost of Goods Produced							
Total							
Less Fin. Goods Sold							
Less Cost of Scrap							
Cost of Closing Stock							

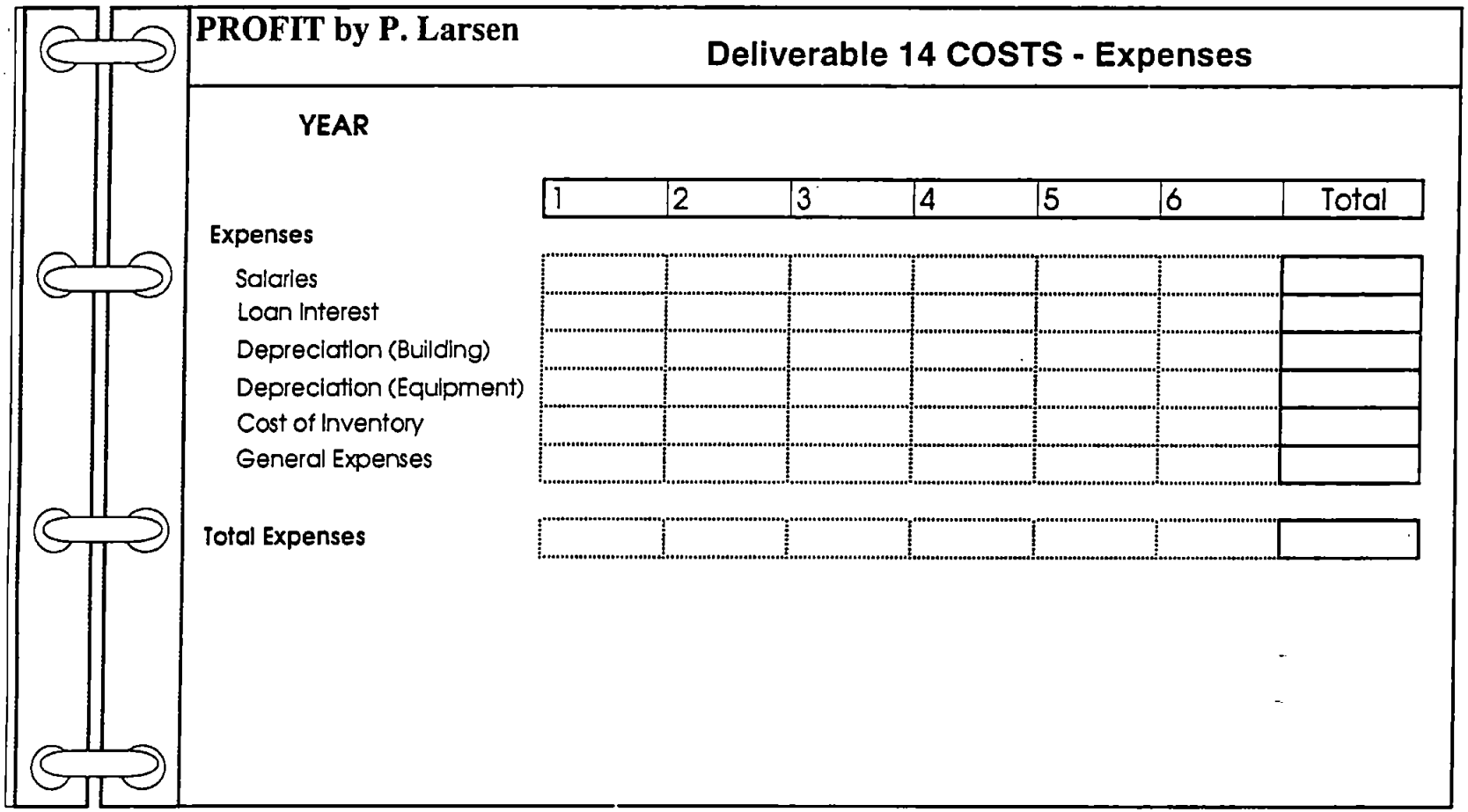


PROFIT by P. Larsen

Deliverable 14 COSTS - Inventory Holding Costs

YEAR

	1	2	3	4	5	6	Total
Capital Invested in Inventory							
Average Raw Material							
Average Bought Out Parts							
Average WIP							
Average Finished Goods							
Total Capital Invested							
Interest Rate							
Cost of Capital in							
Fin. Goods Scrapped							
Total Inventory Holding Costs							



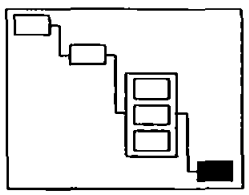
PROFIT by P. Larsen

Deliverable 14 COSTS - Expenses

YEAR

	1	2	3	4	5	6	Total
Expenses							
Salaries							
Loan Interest							
Depreciation (Building)							
Depreciation (Equipment)							
Cost of Inventory							
General Expenses							
Total Expenses							

Workshop 5



Participants:

Finance Director, PROFIT Manager and from the PROFIT Steering Committee - Marketing, Finance, Production and Sales.

Rationale:

Workshop 5 Future Financial Status.

The data for the agreed quantified benefits are entered into the Profit and Loss Account. Followed by the data for the agreed quantified costs. Tool Kit 5.1 is available to provide assistance.

The future financial status step is completed when the Steering Committee have agreed the profit or loss and the return on sales, resulting from the investment, Deliverable 15.

The next step in the PROFIT Methodology is the financial justification of the investment. This requires the Steering Committee to view the Future Profit and Loss Accounts with and without the proposed investment for the three scenarios of Pessimistic, Expected and Optimistic, for the term specified by the Company, Deliverable 16 and Deliverable 5.

By making comparisons of the future with the current financial status of the Company, they are able to assess the viability of the investment in purely monetary terms, that is, the effect the investment could have if it were successfully implemented on the profitability of the Company as a whole or the price that could be paid by the Company if it continued to operate as is (the Cost of Doing Nothing).

At this point the Steering Committee can access Traditional Cost Justification approaches, Deliverable 17, such as, Return on Investment (ROI), Payback Period, Break Even Analysis, etc., thereby, highlighting the risks involved in using these out-dated approaches to the cost justification of new investment. Toolkit 5.2 provides details of the calculations required.

Finally Deliverable 18 is completed by the Steering Committee to record their decision as to the investment. Having decided on whether to accept or reject a proposal, they can return to an earlier stage to carry out further analysis of other investments or terminate the Methodology.

Work Required

Tasks:

Enter data from Deliverables 13 and 14 into Deliverable 15.

Complete Deliverable 16 for the three scenarios and compare the Profit and Loss accounts over the time period with those on Deliverable 5.

Reach agreement on future of Investment.

Complete:

Deliverable 15 - Full Production, Profit and Loss Account with investment, displaying effect on Sales Products for each year of analysis.

Deliverable 16 - Future with investment for the three scenarios over a period up to five years.

Deliverable 17 - Traditional Cost Justification Techniques for each of the three scenarios undertaken.

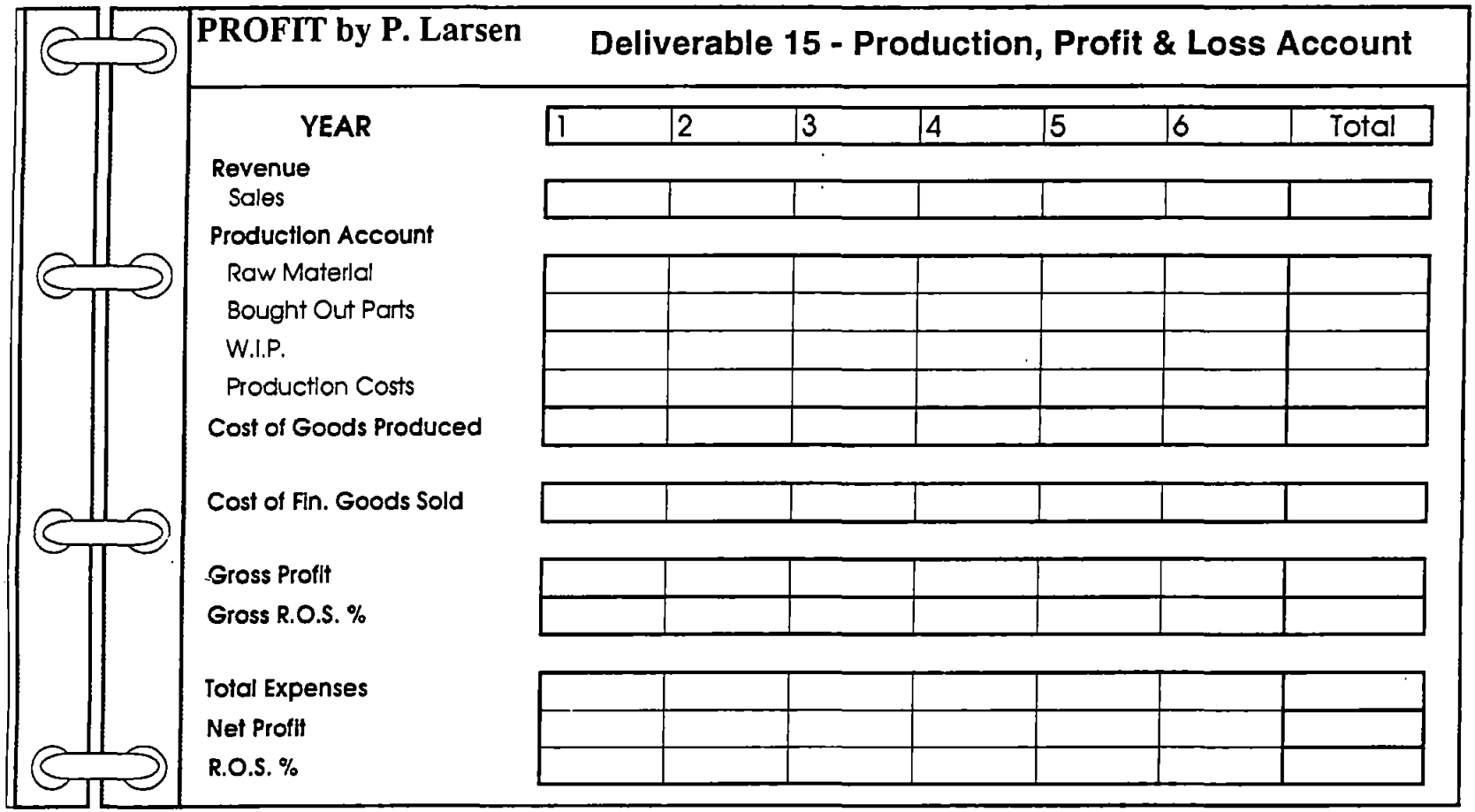
Deliverable 18 - Accept or Reject Investment.

Toolkit 5.1

Calculation of value of investment.

To calculate the effect on the Company's Profit of the proposal, the change that the benefits will have on the Current Financial Status are input as **increases** in the Sales Revenue and **decreases** in the Cost factors of PROFIT's Profit & Loss account as appropriate

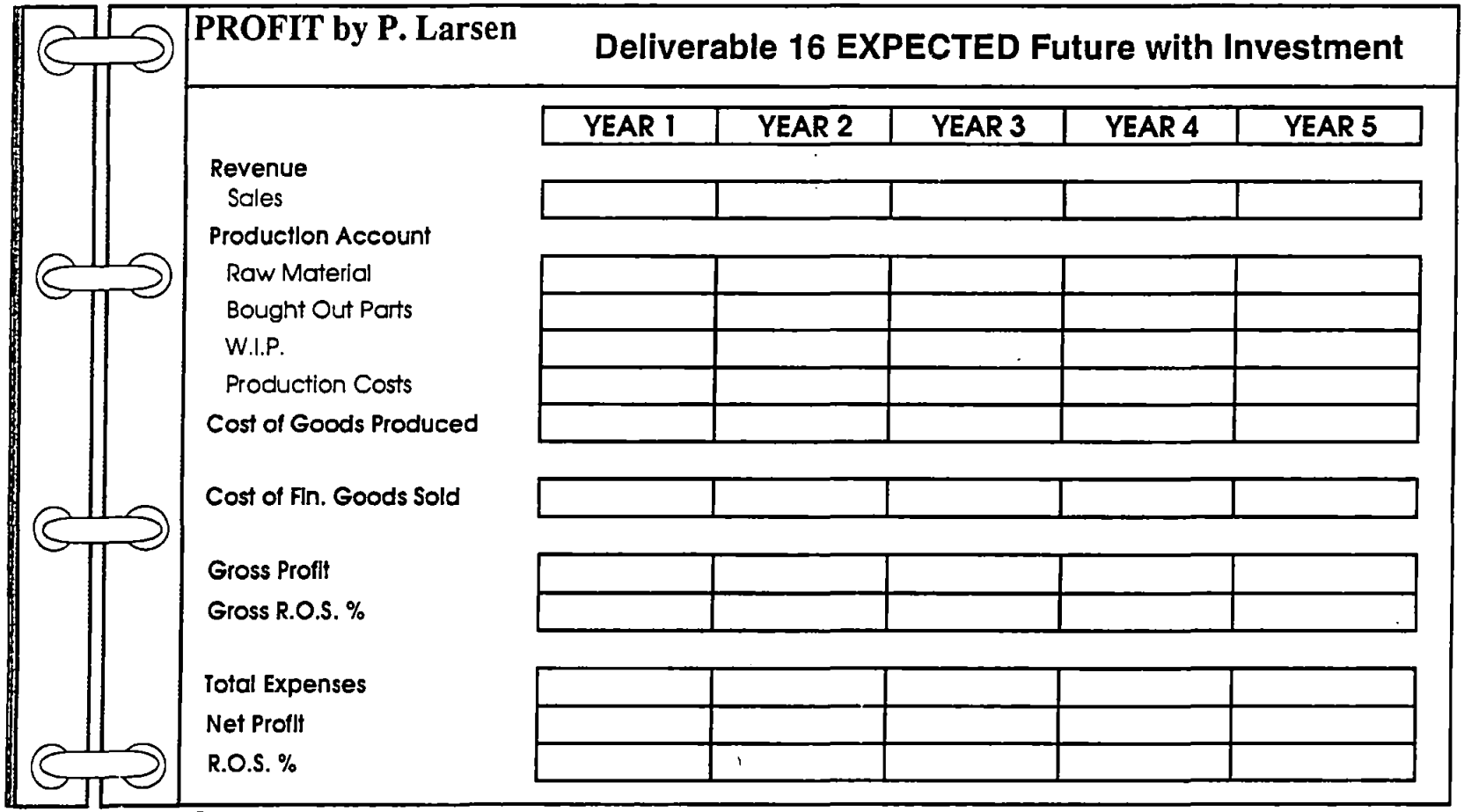
The costs are input as **increases** to the Cost Factors of the Profit and Loss Account and/or as **a finance cost** to be depreciated over the relevant time period. The Investment Period and Interest Rate should be accounted for on Pro-forma 14.



PROFIT by P. Larsen

Deliverable 15 - Production, Profit & Loss Account

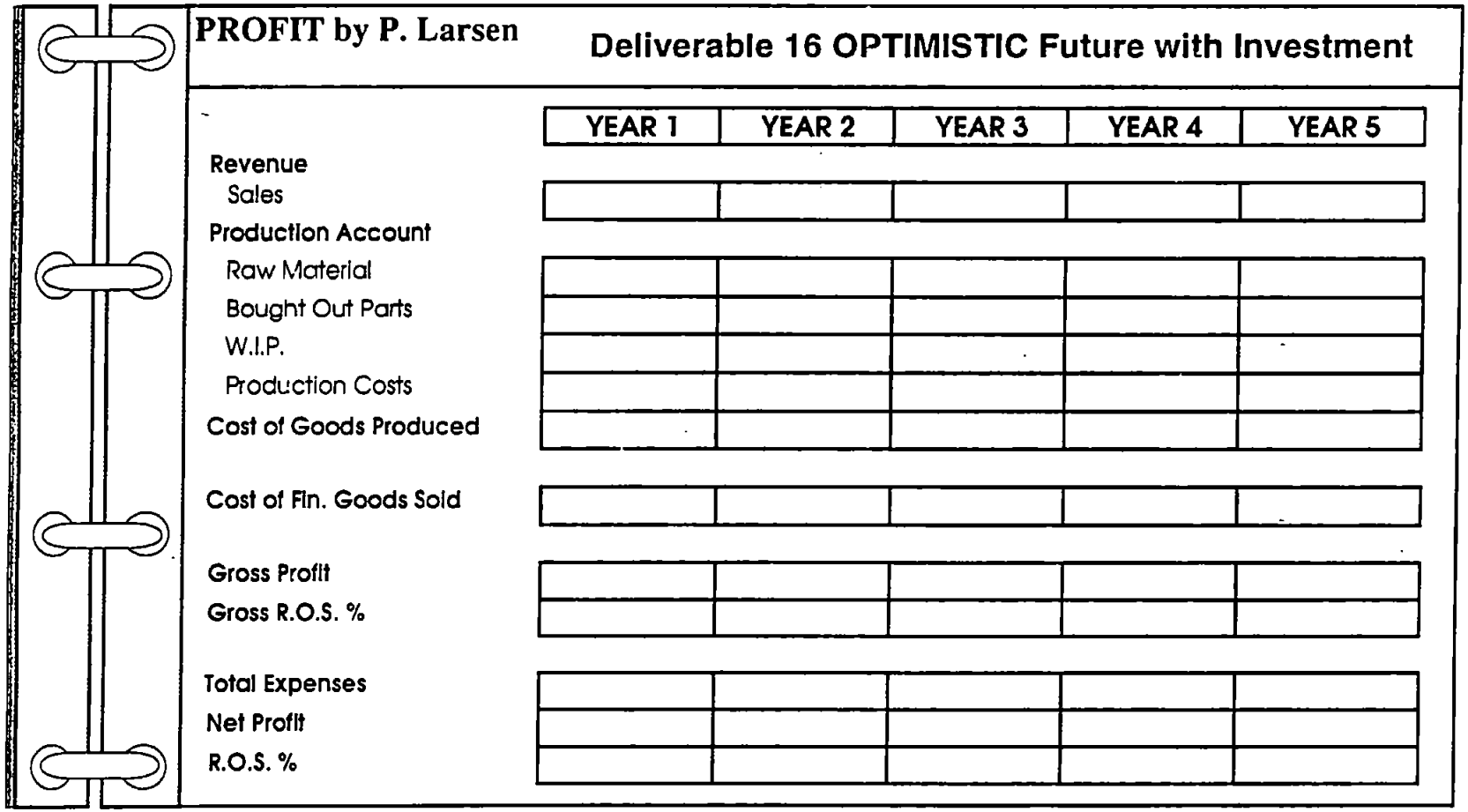
YEAR	1	2	3	4	5	6	Total
Revenue							
Sales							
Production Account							
Raw Material							
Bought Out Parts							
W.I.P.							
Production Costs							
Cost of Goods Produced							
Cost of Fin. Goods Sold							
Gross Profit							
Gross R.O.S. %							
Total Expenses							
Net Profit							
R.O.S. %							



PROFIT by P. Larsen

Deliverable 16 EXPECTED Future with Investment

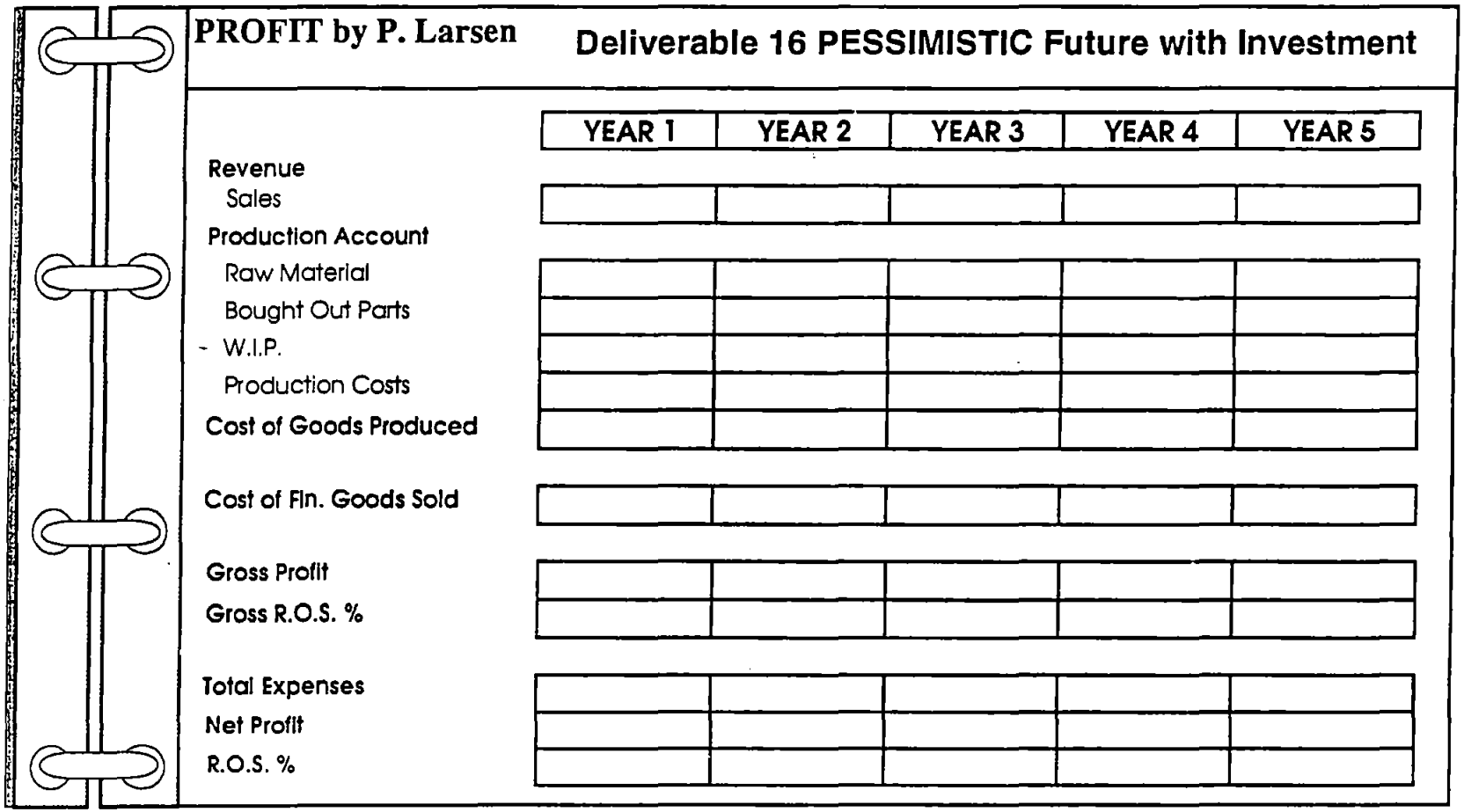
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Revenue					
Sales					
Production Account					
Raw Material					
Bought Out Parts					
W.I.P.					
Production Costs					
Cost of Goods Produced					
Cost of Fin. Goods Sold					
Gross Profit					
Gross R.O.S. %					
Total Expenses					
Net Profit					
R.O.S. %					



PROFIT by P. Larsen

Deliverable 16 OPTIMISTIC Future with Investment

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Revenue					
Sales					
Production Account					
Raw Material					
Bought Out Parts					
W.I.P.					
Production Costs					
Cost of Goods Produced					
Cost of Fin. Goods Sold					
Gross Profit					
Gross R.O.S. %					
Total Expenses					
Net Profit					
R.O.S. %					



PROFIT by P. Larsen

Deliverable 16 PESSIMISTIC Future with Investment

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Revenue					
Sales					
Production Account					
Raw Material					
Bought Out Parts					
- W.I.P.					
Production Costs					
Cost of Goods Produced					
Cost of Fin. Goods Sold					
Gross Profit					
Gross R.O.S. %					
Total Expenses					
Net Profit					
R.O.S. %					

Toolkit 5.2

To calculate the Break Even Point , the formula for the break even point in unit volume is:

BE(Units) = Fc/(P-Vc)

The formula for calculating the break even point in monetary terms is:

BE(Money) = Fc/(1-(Vc/P))

Break Even can also be calculated using:

BE(Units) = Expenses/(Unit Price-(Cost of Sales/Volume Produced))

and

BE(Money) = Expenses/(1-((Cost of Sales/Volume Produced)/Unit Price))

To calculate Payback Period, that is the time required to recover the investment use:

Payback Period (years) = Net Investment / Annual Cash Flows

To calculate Return On Investment (ROI), which is the net income divided by the invested capital, use the equation:

ROI = Net Income / Capital Invested

To calculate the Net Present Value (NPV), which is the investment cost minus the discounted cash flows, use the equation:

$$NPV = \sum_{n=0}^{L} Fn/(1+r)^n$$

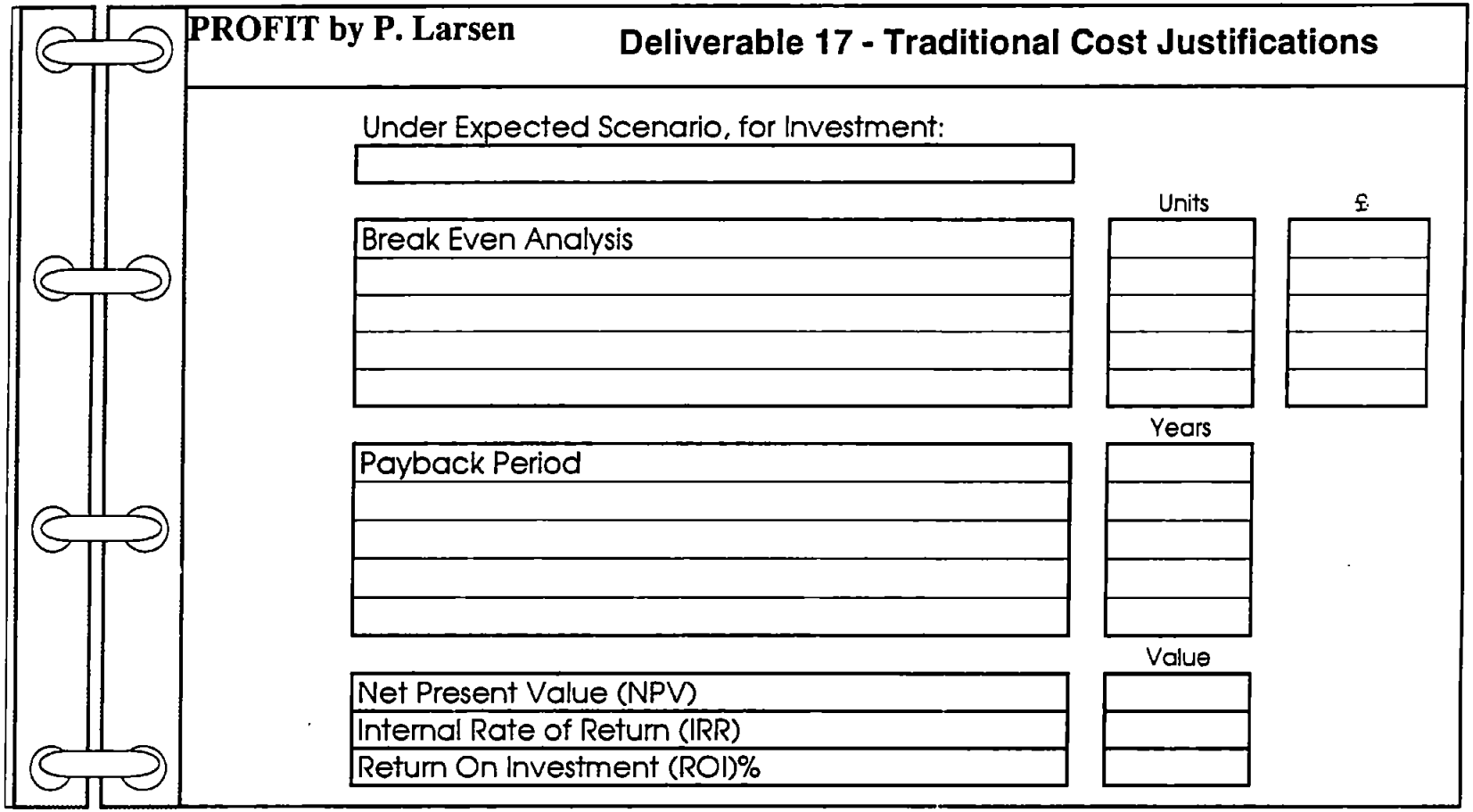
To calculate the Internal Rate of Return (IRR), adjust r in the following equation until NPV equals zero.

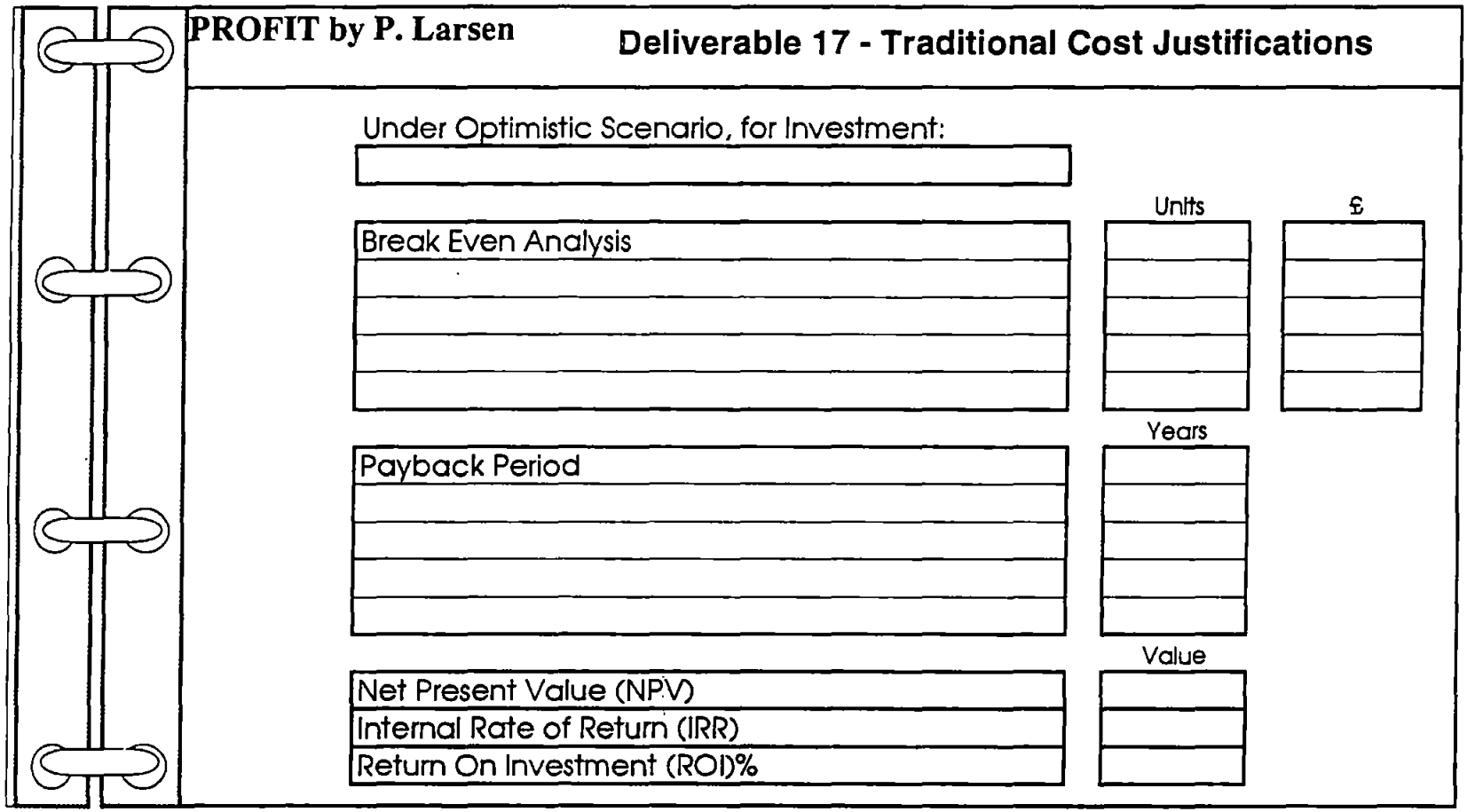
$$NPV = \sum_{n=0}^{L} Fn/(1+r)^n$$

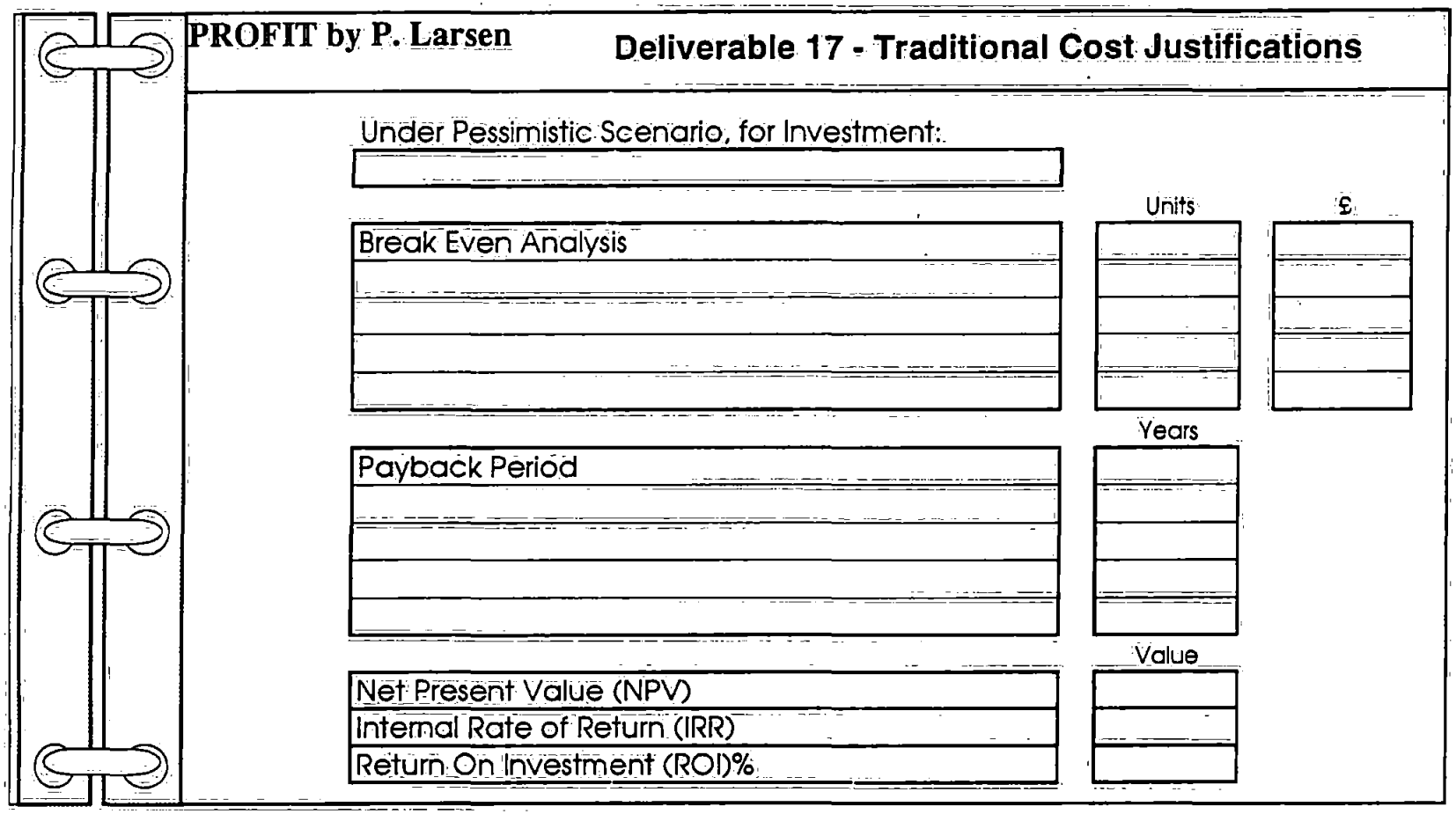
Key:

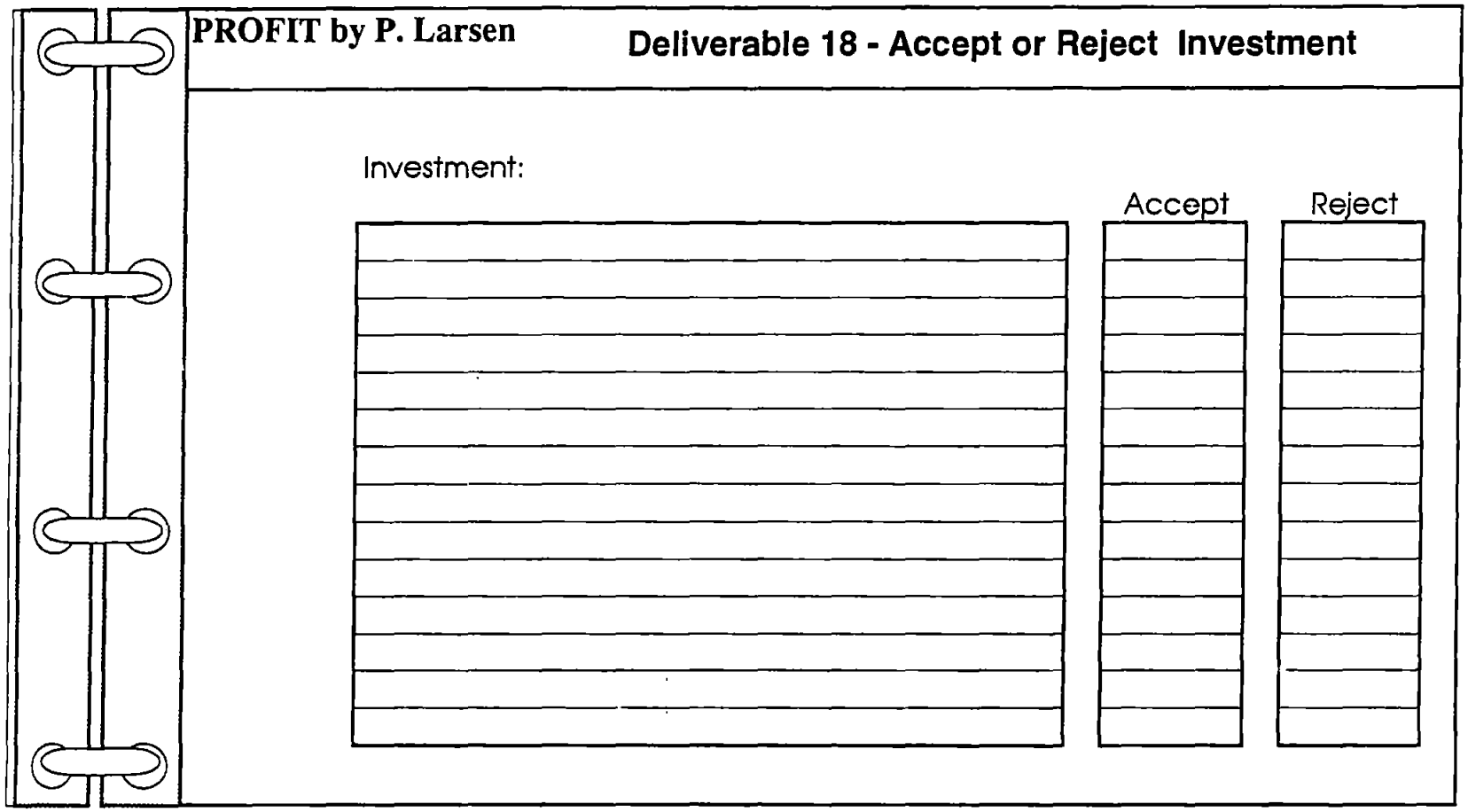
n = Years,
I = Investment,
Fn = Annual cash flows for year n,
r = the rate of interest,
L = the life of the Investment ,
Fc = Fixed costs,
P = Unit price,
Vc = Variable cost per unit.

Deliverable 17 provides the user with the options to calculate values for Traditional Cost Justification methods for each of the three Future Scenarios of Expected, Optimistic and Pessimistic.


PROFIT by P. Larsen
Deliverable 17 - Traditional Cost Justifications
Under Expected Scenario, for Investment:
Units
£
Break Even Analysis
Years
Payback Period
Value
Net Present Value (NPV)
Internal Rate of Return (IRR)
Return On Investment (ROI)%


PROFIT by P. Larsen
Deliverable 17 - Traditional Cost Justifications
Under Optimistic Scenario, for Investment:
Units
£
Break Even Analysis
Years
Payback Period
Value
Net Present Value (NPV)
Internal Rate of Return (IRR)
Return On Investment (ROI)%


PROFIT by P. Larsen
Deliverable 17 - Traditional Cost Justifications
Under Pessimistic Scenario, for Investment:
Break Even Analysis
Units
£
Payback Period
Years
Net Present Value (NPV)
Internal Rate of Return (IRR)
Return On Investment (ROI)%
Value


PROFIT by P. Larsen
Deliverable 18 - Accept or Reject Investment
Investment:
Accept
Reject