
THE NEW PRODUCT COOKBOOK

A common sense guide to developing
your ideas into successful products
and delivering them to your
customers right first time

Gareth Taylor

Acknowledgements

© Gareth Taylor 2003

The right of Gareth Taylor to be identified as Author of this Work has been asserted by him in accordance with the Copyright, Designs and Patents Act 1988.

No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written consent of the Author.

Contact Address:

8 Eversley Place
Newcastle upon Tyne
NE6 5AL
United Kingdom

tel. (+44) (0)191 276 4057
email: gataylor@btinternet.com

This book couldn't have been written without the help and support of others. In particular I would like to thank my family and friends (they know who they are) for their support plus all the people who put up with me eulogising to them as I tried to sort out some of the books' concepts in my own head. I am very grateful to those who gave up their valuable time to read through early drafts in particular David Klaus, Diana Marsland and, my father, Roy Taylor for their constructive feedback and efforts in proof reading. Also to Emma and Alan Harrison for their useful comments and Martin Ellis for his advice on publishing.

OVERVIEW

1. What's This Book About?

In my experience most management books deal with one of two things: points of technicality regarding specific practices or; elements that might be considered to be icing in the cake. Both start with the assumption that your organisation has all the right ingredients and that they are assembled in roughly the right order in the first place. In a competitive environment where day to day pressures distract managers from the strategic vision it is surprising how many companies fail to make sure they do this.

At the heart of your business are the products you offer to your customers. It is also highly likely that your organisation is highly optimised about those products. So if products are at the heart of your business, why is it that so many companies rarely succeed in getting new products into the marketplace right first time? This is rarely because of the talents of the people involved, but more frequently because of the environment they have to work. Over years spent in industry, conversations with customers, suppliers, other industries and even competitors highlighted that getting new products to market right first time is one that has vexed them all (and continues to do so).

Possibly the answer is because organisationally businesses do not place the creation of new products at the level of priority that they need. Optimisation does not necessarily equate to flexibility and new products may not succeed if old practices are maintained. Or else it is because the procedures and processes in place do not fully address the needs of your markets and more specifically your customers from those who will have to deliver the product to the consumer through to the end customer themselves. It all comes down to a systematic approach that ensures that as many bases as possible have been covered before the product is launched.

Talking to people while writing this book I came to three fundamental conclusions:

- ▶ Every business is unique.
- ▶ There is no one universal formula to developing new products.
- ▶ The principle elements of product development are generic (regardless of whether the product is a manufactured article, software or a service/ solution package)

This book is a sort of management cookery book. It is designed to inform and stimulate. It provides guidance, thoughts and recipes that will enable you to identify, establish or refine optimum practices for your organisation. However it's up to you, the reader, to decide how to put them into practice.

Gareth Taylor
August 2002

2. Who Should Use This Book?

This book primarily addresses the management of product introduction. Product Introduction is the discipline of turning ideas into marketable items that will profit your organisation and your customers. Here the term "product" can mean anything: from an insurance policy through to a manufactured item; from a tailored service to piece of computer software. It aims to satisfy a broad range of people including:

- ▶ Senior managers who are seeking to improve development performance in their organisations
- ▶ People involved in product development activities
- ▶ Students studying industrial design

This book has been written in a concise manner. There is a lot of information here. The reader is encouraged to read the book and keep it handy so that they may continue to use it as an everyday reference.

CONTENTS

Section A Some Principles of Product Introduction

- A1** Why a handbook on Product Introduction?
- A2** Establishing a Balanced Portfolio
- A3** Product Introduction - what is it?
- A4** Product Introduction Discipline
- A5** 4 Basic Stages of Product Introduction
- A6** Implementing a Product Introduction Process

Section B Marketing for Product Introduction

- B1** Marketing for Product Introduction
- B2** Basics of Marketing
- B3** Gathering Background Market Intelligence
- B4** Getting the Information First Hand
- B5** Evaluating Market Potential
- B6** Benchmarking
- B7** Determining the Return on New Product Investment

Section C Managing Product Introduction Projects

- C1** Project Management
- C2** Project Planning
- C3** Gantt Charts
- C4** Critical Path & PERT
- C5** Risk Management
- C6** Project Control & Reporting
- C7** Managing Innovation
- C8** Intellectual Property

Section D Idea Generation Techniques

- D1** Lateral Thinking
- D2** Brainstorming
- D3** Trigger Words
- D4** Morphological Charting
- D5** Checklists
- D6** Syntectics
- D7** Idea Evaluation
- D8** Workshops

Section E People & Communication

- E1** Teamworking
- E2** Building a Team
- E3** Working with Externals & Third Parties
- E4** Meetings
- E5** Stress Management
- E6** 10 Steps to Make an Effective Presentation
- E7** Presentation Media

Section F Analytical Techniques

- F1** SWOT Charts
- F2** Order Qualifying and Order Winning Criteria
- F3** Flow Charting
- F4** Pareto Analysis
- F5** Input/Output Charts
- F6** Cause & Effect Analysis
- F7** Failure Modes & Effects Analysis (FMEA)
- F8** Quality Function Deployment (QFD 1)
- F9** Concept Evaluation

Section G Systems Integration

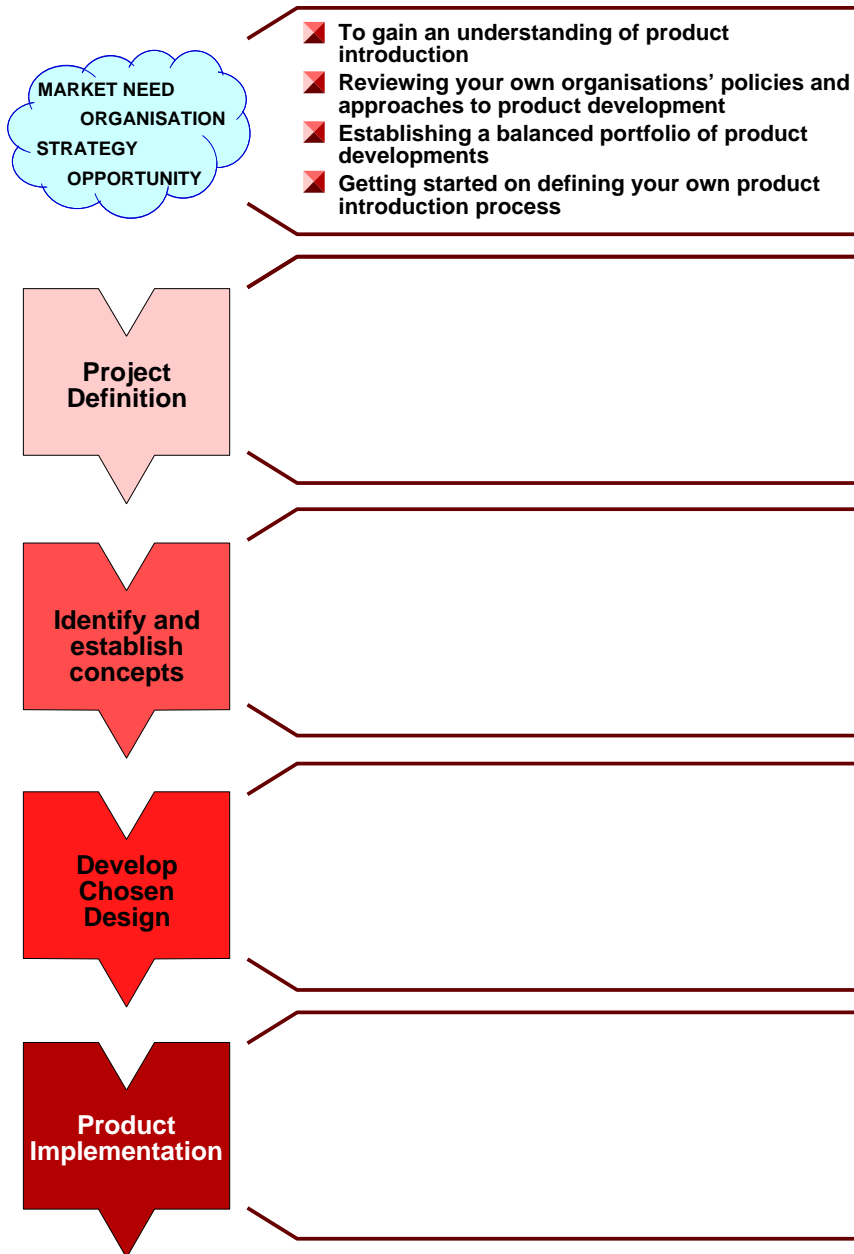
- G1** Introduction to Systems Thinking
- G2** Creating Added Value in Products
- G3** Production Systems
- G4** Business Processes
- G5** Services & Support Systems
- G6** Environmental Compatibility

Section H New Product Implementation

- H1** Launch Planning
- H2** Change Management
- H3** Training
- H4** Managing Conflict
- H5** Measures of Performance for Product Introduction
- H6** Product Support
- H7** Closing Product Introduction Projects

Section I Useful Information & Data

- I1** Growth Curves
- I2** Balance Sheet Formulae
- I3** Present Value Look Up Table
- I4** Non-Financial Methods of Assessing Potential Products
- I5** Design for Manufacture & Assembly
- I6** Rapid Prototyping



OVERVIEW TO THE PRINCIPLES OF PRODUCT INTRODUCTION

To be competitive in today's global marketplace, organisations need to have three key attributes. They must be:

- ❑ In tune with their customers
- ❑ Optimised to deliver their current portfolio of products as efficiently as possible
- ❑ Able to respond to their markets by developing new products to meet changing needs

The first two are what most businesses focus on (and consequently much of the associated literature that is produced), since these determine day to day success. Conversely many companies struggle with the latter attribute - that is the process of getting new products to market right first time. This might be considered as ironic when you consider that the products and services you offer are the lifeblood of your organisation. There is a critical need in every business to ensure that you will continue to maintain or develop your competitive standing in whatever markets you participate in. It would therefore be logical to assume that your organisation has a collective interest in seeing that the next generation of products are successfully developed and introduced. In reality daily pressures mean that product development is relegated from the top list of issues facing most managers and left to a minority in the organisation to develop.

The problem with leaving development to a specialist function is that while those people will be expert in the art of translating technology and function into a product design, that does not necessarily mean that what they create will be right for the market (or even the needs of your organisation) in the face of changing competitive pressures. The best product for a business is not necessarily the most technically advanced or radical but the one that, through compromise and risk management, sells and yields a profit for your organisation. A successful product is one that:-

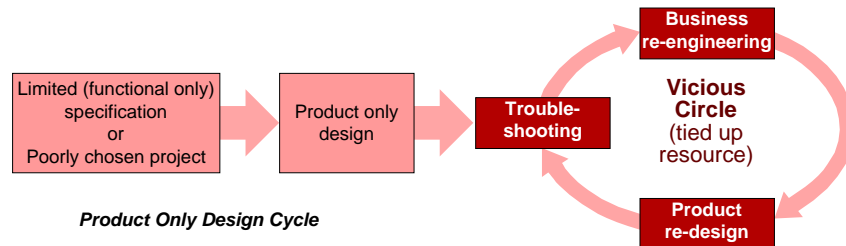
- ❑ Meets the market need and satisfies customer expectation
- ❑ Can be produced and delivered effectively and reliably to your customers
- ❑ Opens the door to additional or future business opportunities

This book centres on the concept of *Product Introduction*. While Section A1 has a more formal definition of what this is, in essence it goes beyond the bounds of traditional product development. It begins with identification and prioritisation of opportunities and ends with successful delivery of a new product to the marketplace. Whereas product development tends to be associated with the physical design of the article, *Product Introduction* encompasses the need to develop and implement the services and systems that enable a new design to be successfully integrated into the business.

By implication *Product Introduction* is a multi-disciplined activity that requires the participation of the whole organisation. As a process it is inherently more involved than the traditional design cycle. Yet the best approach to implementing a *Product Introduction* methodology in your organisation is back off from process and procedure. Instead emphasis should be placed on creating a business framework that propagates team culture (also required for successful product introduction) and allows them to flourish in an entrepreneurial environment that offers a degree of flexibility according to the nature of the product being developed.

The degree to which you move to a full blown cross-functional team approach will largely be determined by a combination of the size of your business, the nature of your product, geographic constraints and the lifecycle of the products you offer. As a general rule of thumb the larger the organisation the more a formal approach to team creation and developing frameworks is required. For smaller organisations *Product Introduction* should be adopted as a philosophy, using the principles to create products that facilitate growth.

Moving to an all inclusive system of product development is not without it's problems. The traditional development function is likely to feel threatened and the rest of the organisation is not likely to want to release resources to support an activity not focused on the issues of the day. This is an issue that needs careful management. It should be made clear that while traditional R&D (technology development) lies within the domain of the development function, bringing products to market is the collective responsibility of the organisation. One of the benefits this brings is to break the vicious circle that often lies at the end of any product developed without due attention to the systems and organisation that will support it.



In this situation products and businesses frequently get into a cycle of re-engineering and redesign as it attempts to adopt new products and practices. Some of the usual sources of this cycle are:

- ✗ Poor specifications that only focus on functional issues
- ✗ Bad fit with the market need
- ✗ Inherent complexity in the finished article (making it hard for the organisation to deliver the product to its customers)

The upshot is that a business becomes preoccupied with problems relating to the existing portfolio of products rather than focusing on achieving excellence with next generation of products. It is this cycle that Product Introduction aims to eliminate by including the business re-engineering (or **Systems - Section G**) aspects into the development activity.

One of the major cultural shifts needed to make a product introduction philosophy successful is to move the organisational view of product development from being one of cost to one of investment. This single shift in perception can make an all important difference in attitude. Too often I have seen the situation where product development is seen by senior management as a cost with the result that the culture for innovation is stifled and becomes stagnated in the face of organisational indifference.

Product development is an investment by an organisation in itself and, like any investment, it carries a risk that needs to be managed. Similarly the decision to invest should not be taken lightly and should only be done once the full implications are understood. It therefore makes sense that an organisation develops a portfolio of projects that represent a balance of risk. Section A2 discusses the practicality of developing a portfolio and the sort of balance that needs to be achieved. Tailoring the exact ratios will be very much dependent on the type of business you are in and even the stage of growth your organisation is at.

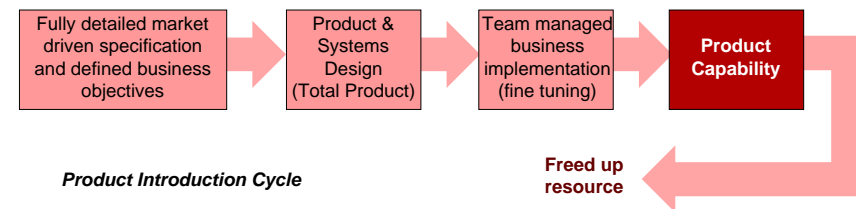
Much of Section A is intended to give an overview of what Product Introduction is about, but to appreciate it fully much of the book needs to be looked at. Sections B through H cover the elements of product introduction practice. The way in which these are used is really up to you the reader to apply them in ways that make sense for your business. In summary these sections cover:

Section B - Marketing

The foundation of any successful product development project is getting a firm grasp of your markets, identifying and assessing the opportunities they present and, finally, translating them into clear specifications

Section C - Project Management

The other key binding element of product introduction is strong project management that maintains focus on meeting the objectives of the product development while encouraging and fostering innovation throughout the process.



Section D - Idea Generation

Innovation often starts with new thinking stimulated from new ideas. This section looks at ways of generating and managing the process of seeking new ideas.

Section E - People & Communication

Assembling a team should never be an ad-hoc process, care and attention should be taken to ensure the right balance of resources and skills are present. Once a team is formed it then about people working together to achieve common goals and interacting so that the sum is greater than the whole.

Section F - Analytical Techniques

The converse of idea generation is to eliminate options through analysis and review with the aim of selecting the ones that work best in the context of the project. Associated with this is the quantification of risk to ensure that the product is delivered on time and to cost.

Section G - Systems Integration

Successful products not only meet the market need, but also fit with the organisational capability to deliver them to your customers. This requires looking not only at the fit of the product to the business but also the converse i.e. pre-emptive redesign of aspects of your organisation to fit the new products.

Section H - Launching Products

The final stage of product introduction is to transfer the completed design to the organisation. The emphasis here is that this is a process that needs to be managed - preferably by the team who developed the product. This is where tensions can arise since there is always a desire to get the next project started. The moral here is: make sure you have fully finished what you start before embarking on something else, otherwise the open ends of the past always catch-up with you.

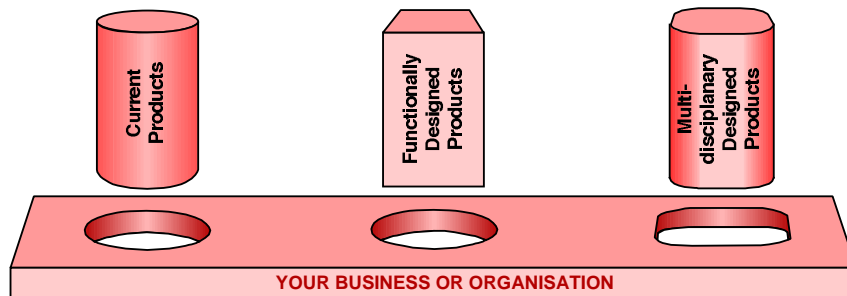
By this stage you may be feeling that product introduction is both complex and inherently risk averse. The answer is that both are true, but both are manageable if the organisation embraces the principle that new products are an investment where a return is expected. Speculation should be left to the realms of fundamental R&D to create radical new approaches for future generations of products. Looking at these two issues in a bit more detail:-

❑ Managing Complexity

The complexity issue can be made worse by attempting to create an all singing, all dancing *product introduction* process that accounts for every eventuality. This may be fine on paper when attempting to define exactly what it is you are trying to achieve with your process, but in practice the better approach is make the framework, specifications, goals and milestones (including points of review) clear at the outset of a project and leave the team to figure out how they will get there. Transferring ownership and responsibility to a team can create that "innovation through necessity" culture that can be so prized where resources are constrained.

❑ Managing Risk

Product Introduction is a risk averse process. That is not to say that risks should not be taken, or that innovation should be stifled as a result. The need to stay ahead of the competition means that risks should be taken, but in the context of prudence. Any decision made should be taken with a firm grasp of the risks that may entail. Product Introduction is about securing your next generation of revenue, so a decision to adapt unproven technology, or go for a radical change in business practice to deliver a new product should be taken in full cognizance of what the implications are and the impact of failure should you not succeed.



Ultimately product introduction is about developing products that simultaneously meets the needs of your customers and fits with your business. This is the successful output of an entrepreneurial product development philosophy where changing the rules also means changing the system and taking responsibility for doing so. In other words you not only have to create products that address a market opportunity, but also ensure that the organisation has a fit with the new product and, where necessary, modify the organisation to fit the product. In this way *Product Introduction* provides not only regeneration of your product portfolio but also becomes the vehicle for business evolution to meet the competitive pressures of an ever changing global marketplace.

10 Key Messages You Should Get From This Book

- 1 *Product Introduction* is not R&D (R&D is about developing and minimising the risks of new technology, *Product Introduction* is about creating new products to supply your customers - don't mix the two)
- 2 Shift your culture from one of "product development is a necessary cost" to one of "creating new products is an investment we have to protect"
- 3 Get your marketing right and only choose the projects that will make the best return - don't forget that markets change and must be constantly re-evaluated
- 4 Construct a portfolio of projects that balances risk with reward, near-term with long-term and certainty with opportunity
- 5 Create an entrepreneurial framework for *Product Introduction* that is balanced with strong project management
- 6 Once the decision has been made to move to a *Product Introduction* methodology, stick to it (it gets easier with time)
- 7 Products do not exist in isolation, they require systems to deliver them to your market and synergies can be derived from taking a holistic approach to their development
- 8 People are your most important asset, make sure you treat them accordingly to get the best return from them
- 9 Take time to use tools and techniques to explore ideas and develop a sound basis for all decisions made during the design process
- 10 *Product Introduction* starts with a fully defined opportunity and ends with a product capability (or only start when you are clear about what you're taking on and only finish when the job is running smoothly)

ESTABLISHING A BALANCED DEVELOPMENT PORTFOLIO

1. Introduction

A
2

Treating product development as an inward investment rather than a cost should promote a different set of attitudes regarding the expectations from this activity. For instance, most parts of an organisation are required to cost justify any investment they make either in terms of payback or, a ratio of amount spent to business gained. Peculiarly many organisations do set similar targets for product development.

Consider yourself investing a similar amount of money in the stock market that would otherwise be spent on product development. You would choose to structure a portfolio of stocks across which you would spread the investment. These would probably be made up of relatively safe blue chip stocks, smaller companies that you determine have growth potential and finally high risk penny share or newly floated companies that have significant potential for growth and equally high risk of failing. Your expectation would be that the blue chips would give you a steady return, the medium companies hopefully have a better return but not necessarily as certain as the blue chips and the high risk stocks - if successful - may yield returns that could double your overall returns, but similarly may fail. Since the name of the game is not to lose your shirt, you are likely to spread the investment roughly in the proportion of: blue chips 40-60%; mediums 30-50% and, high risks 5-20%. You should also consider your product development in a similar way.

2. The Product Development Mix

A balanced product development portfolio should consist of a mix of the following:

❑ Reactive Developments

These are short term developments, usually based on existing products and markets with a view to maintaining competitiveness (extending the product life cycle). Such investments are fairly low risk since the risk & return are relative easy to predict.

❑ Proactive Developments

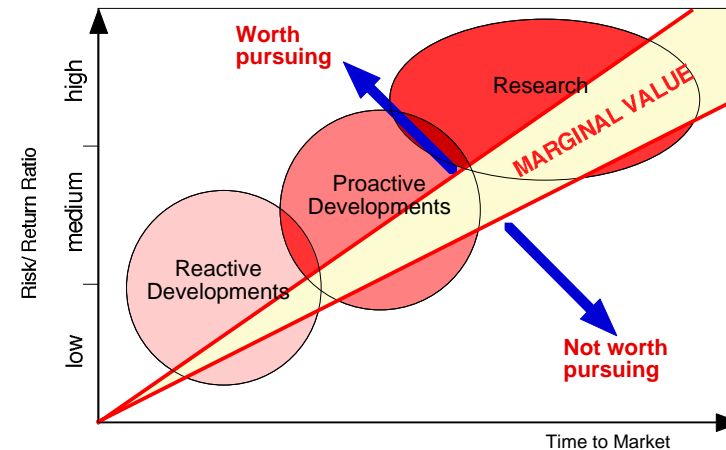
These are usually longer term developments which require extensive integration of new technologies or concepts to either create new market opportunities or, to develop a significant leading edge over competitors. Here risk increases since there are more variables that may affect success during the product development.

❑ Basic Research

While not strictly product development, research provides an impetus for future products. Research always has the highest risk of failure since by definition it is speculative and is usually not focused on any specific product need. Hence it will not necessarily lead to results that can be incorporated into a new product.

Rather like your stock market portfolio you will need to determine the correct mix for your business. This may depend upon a number of different factors including your size, your market(s) and your desired competitive position. Where growth is a key driver in your business an emphasis on proactive development and research must be achieved since these should represent your future high earners.

In practice your portfolio should be made up of the three clusters as shown on the next page. The size of these clusters in terms of investment would normally be in similar ratios to that of a stock market investment.



A
2

3. Maximising Your Return by Outsourcing or Partnership

In practice you are restricted by the amount you can invest. One way of expanding your portfolio is to look at working with third parties. This can have the advantage of being able to supplement your own capabilities with expertise, knowledge or technology that you do not currently have. This also avoids the problem of having to develop the capability in-house. There are two basic ways of doing this:

❑ Outsourcing:

A third party is used to perform all or part of development in return for a fee. The usual reasons for doing this are: to address gaps in your in-house skills, to improve marketability by using a well known third party, or because the work can be accomplished in shorter timescales with lower costs.

❑ Partnerships:

A partnership usually attempts to offset fees for a return on sales either through royalties or guarantees of sub-contracted business. This has the advantage of sharing complimentary skills and risk, but can have the downside that the third party usually retains all design and intellectual property rights to its work. Partnerships are often useful for reactive developments and sometimes sharing research effort can also be of benefit.

4. Establishing a Portfolio

- ❑ Start by analysing your current development activities and prioritise them according to the categories so far discussed. This should highlight any imbalances in your current portfolio.
- ❑ Map your activities to your business strategy and determine if a shortfall exists.
- ❑ Work with all relevant parties to review all current product development activities against business needs and agree a priority plan.
- ❑ Identify opportunities for future product development and fit those to the current business capabilities.
- ❑ Where gaps exist develop plans to fill them either via internal or external means.
- ❑ Implement a plan to establish a balanced portfolio.

This process may take several months to determine a plan and even longer to implement. The key is having once determined that a balanced portfolio is required, discipline is required to see it through.

DETERMINING RETURN ON PRODUCT INVESTMENTS

1. Introduction

Traditionally development payback has been viewed solely in terms of the cost of designing the product. But consider how many other costs are usually incurred when launching a new product into the market place. Only when these have been taken into account can the actual benefit of embarking upon the project be evaluated. Calculating these costs is not a trivial exercise but experience, business targets determined by business strategy and benchmarking can assist here. Once costs have been collated the next step is to prepare a balance sheet of expenditure against income. From this sheet a number of important factors can be derived:

- ▶ Target production costs
- ▶ Time to break even
- ▶ Target pricing (& profitability)
- ▶ Performance measures for product introduction project

2. Sources of Cost

In any evaluation, there are two types of cost that must be accounted for:

- ▶ **Development:** these are generally one off costs associated with putting a product through to launch
- ▶ **Delivery:** these are the ongoing costs associated with supplying the product to the marketplace

Each of the above has a number of categories that individually need to be quantified:

Development Costs	Delivery Costs
▶ Product development spend (derived from project plan)	▶ Cost of materials (includes bought in services & components)
▶ Earlier costs incurred in research	▶ Manufacturing and/or production costs
▶ Intellectual property and/or licensing	▶ Advertising and/ or promotion
▶ Market evaluation	▶ Distribution
▶ Production and/or systems set-up costs	▶ Product support
▶ Training and/or hire of new personnel	
▶ Documentation preparation	
▶ Initial promotional activities	

3. Setting Up A Balance Sheet

Setting up a balance sheet for a product yet to be sold is an exercise in speculation. While costs are normally fairly easy to quantify - estimating potential sales is more difficult. The only way to achieve an accurate forecast is using thorough market research and good scenario planning. Having access to historical data can support the justification and extrapolation of trends. This data can also be used to determine the S-Curve. This can then be used as a function to generate growth data based upon the estimated level of business you expect to achieve.

In the following example two income streams are anticipated from the development of a new product: initial sales and subsequent service contracts. Expenditure is

	P1	P2	P3	P4	P5	P6	Total
Income							
Sales							
Sale of product	-	-	509	1,945	3,900	5,700	12,054
Service contracts	-	-	15	138	343	585	1,081
Total Sales	-	-	524	2,083	4,243	6,285	13,135
Expenditure							
Introduction Costs							
Development	223	463	142	-	-	-	828
R&D/ Marketing & Launch	90	124	194	-	-	-	408
Production scale-up	-	170	170	170	170	-	680
Cost of Sales							
Materials	-	-	236	937	1,910	2,828	5,911
Advert., Dist. & Support	-	-	152	603	1,230	2,011	3,996
Total expenditure	313	757	894	1,710	3,310	4,839	11,823
Balance	(313)	(757)	(370)	373	933	1,446	
Cumulative Balance	(313)	(1,070)	(1,440)	(1,067)	(134)	1,312	

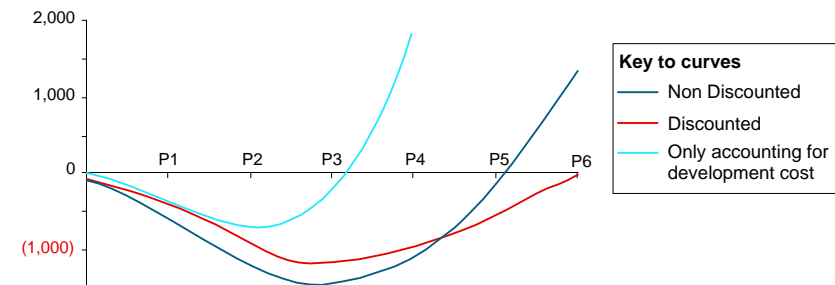
summarised in terms of the one off costs and ongoing costs. For cost of sales a common trick is assume that the various categories are a percentage of the sales (which should have been derived by other means). The production scale-up cost is actually a lump sum spent in P2, however it common to amortise such spend.

4. Discounted Analysis

If you were to invest money in a high interest savings account you would have an expectation of a certain return on that money. When introducing new products you expect to do better than a savings investment. To gauge whether or not a new product is actually a good investment it is usual to apply a discount factor to the balance. Rates of return typically range between 10% and 40% per annum depending upon the sector and the type of investor. If we expect a return of say 18% per period, then this is known as the discount rate. This can be worked into set of multiplication factors which are then used to modify the balance (see also section H7). Looking at the previous figures with a rate of 18% we get:

<i>Discount factor</i>	1	0.820	0.672	0.551	0.452	0.371
Discounted Balance	(313)	(621)	(249)	206	422	536
Discounted Cumulative Bal.	(313)	(934)	(1,183)	(977)	(555)	(19)

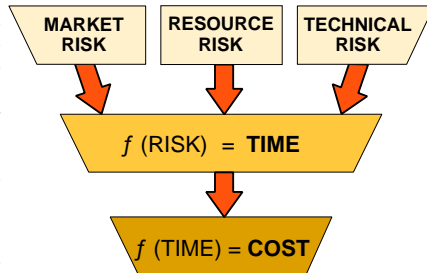
From this revised perspective although the project does achieve the desired return on investment within the 6 periods considered. From this point of view the value of the product development is marginal and a business decision would be required to determine whether or not to proceed. A comparison of the cumulative returns is shown below. The key message here is that evaluating products solely against development costs does not reflect the true cost of introducing a new product and is therefore not a suitable way determining the potential value to the business.



RISK MANAGEMENT

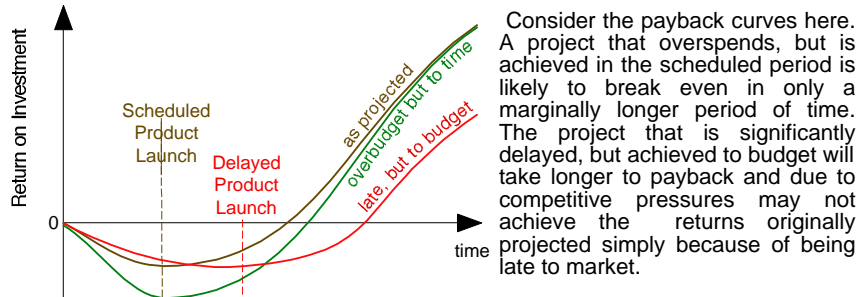
1. Introduction

Product introduction is an activity that contains significant risk. It is an activity that must attempt to break new ground with the state of the art, foster innovation but still operate within the constraints set by the business. Normal project management thinking sets a balance between time, quality and cost. However in a product introduction activity, time is probably the most important variable since the return on investment is entirely governed by the sales of that product in the marketplace.



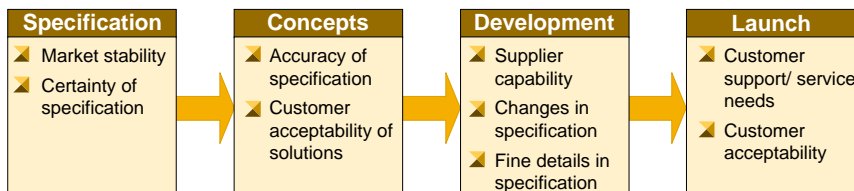
There are three principal areas that represent sources of risk to a product introduction project: technical, resource and market. The primary effect of failing to manage these risks properly is that the project will overrun in terms of time. The secondary effect of this is that increased time will cost you more one way or another.

C
5



2. Market Risks

A product introduction activity may start with a detailed product specification, but over the duration of the project it is highly likely that aspects of the specification or fine tuning details will change. Hence maintaining an eye on the market requirement for your product is key to successful introduction. Within a basic product introduction process there are a number of risks that need to be addressed at various times. Note that the term 'customer' can apply equally to those who will be providing sales revenue and those who will be delivering the product to your customers.



2. Resource Risk

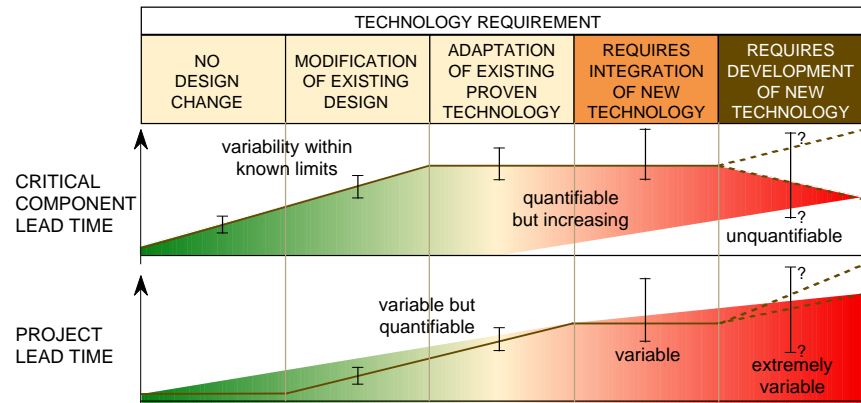
Ensuring that you can tackle the various tasks within a project requires the availability of the right resources at the right time. Risks associated with resources usually fall into one of three categories:

- People/ critical skills:** This is usually dictated by the capacity of personnel within the project team, or the availability of external resources (e.g. other business functions or suppliers) to deliver objectives. Both can be mitigated by good communication and anticipating bottlenecks.
- Availability of test resources:** Test facilities or services can often be employed by more than one business or development team and hence can be heavily utilised. Setting test dates as immovable milestones usually helps to focus the product introduction team.
- Leadtime on critical components:** Usually the more complex the component, the longer the leadtime and the greater the need to clearly communicate the specifications and needs to the supplier and maintain a continuous dialogue with them.

3. Technical Risk

Product Introduction is always a compromise between a desire to achieve state of the art and the practical reality of being able to get a product to market in the time specified. As the unfamiliarity of the technology being used increases so too does leadtime and the inability to precisely determine how long a project will take. The indirect outcome of this is of course increased costs. It is important to remember that there are always less technologically sophisticated solutions and that the really radical ones are best left to the R&D people for the next generation of products.

C
5



4. Minimising Risk

- Review project regularly against original objectives and be prepared to adapt
- Use tools such as Failure Modes & Effects Analysis to identify material risks
- Always check well in advance that resources will be available
- Continue to articulate project objectives to all involved on a regular basis
- Ensure that all team members understand risk issues
- Develop and implement contingency plans for high risk items
- Always act immediately on high risk items - **NEVER** put them off

IDEA EVALUATION

1. Overview

With all idea generation techniques, it is important not to judge contributions during the actual process. Nevertheless it is equally important that after the exercise (preferably immediately or following a short break), the results and implications are discussed while the activity is still fresh in people's minds. This is particularly so following sessions such as brainstorming. The debriefing session should focus on the following :

- ✔ Compare suitability of ideas generated to meet defined objectives
- ✔ Eliminate non-starters
- ✔ Indicate solution paths that merit further exploration

To capitalise on the innovation resulting from a session it is important to judge the results in an impartial manner. One way of ensuring this is to evaluate each idea against an agreed list of selection criteria. A simple method to ensure this, is to compile a matrix which maps the ideas generated against the requirements. For speed, ideas should be evaluated qualitatively, with emphasis placed on the potential of an idea to provide direction rather yielding a direct solution to a problem. The technique here is not rigorous but will ensure that no idea is rejected merely on the basis of preconception about its' potential worth. This technique works best using a team based approach, but can also work well for individuals working alone particularly if using checklists as the base for evaluation criteria.

2. Choosing Selection Criteria

Selection criteria should be determined only after the idea generation activity has taken place (this prevents preconceptions about the eventual outcome). Further, they should be decided in isolation with the results of the exercise put to one side. When determining a suitable set of selection criteria they should cover three areas:

- ✔ **Technical factors**
(e.g. from performance specification, customer specification)
- ✔ **Economic factors**
(e.g. from cost targets, installation experience)
- ✔ **Safety (and legislative) factors**
(e.g. from market intelligence, knowledge of international standards)

In the case of a product introduction project, several criteria may already be determined by the project specifications. For a quick, balanced assessment, it is important that :

- i. The selection criteria must cover all important decision making factors.
- ii. Factors should be chosen to be as independent of one another as possible (i.e. try to avoid selecting criteria that may be interpreted in a similar manner - or may be the subject of debate as to meaning later on).
- iii. Wherever possible factors should be chosen so that an instant decision can be made using simple qualitative terms such as:
 - ✔ strong or weak; high, medium, low {H, M, L}
 - ✔ a simple symbolic approach positive, negative, no benefit, can't resolve {+, -, O, ?}.

3. Evaluating an Idea Generation Session

1

An appointed leader, asks the team to suggest criteria by which the results of the forthcoming session can be judged. Note that some of the criteria may be predetermined from checklists or project criteria. If the idea generation activity has already been conducted put the results of the activity to one side and proceed.

Essentially the criteria should be a decomposition of the problem statement into a series of factors which in turn describe attributes of the issue being addressed. Each proposed criterion should be briefly discussed and agreed by the group majority.

Once the criteria have been determined they are entered in a table similar to the one shown below. The documentation from the idea generation stage should then be retrieved, and the results entered onto the table in the appropriate place.

FUNCTIONAL REQUIREMENT (BASIC SELECTION CRITERIA)	IDEAS (POTENTIAL SOLUTION PATHS)				REMARKS/ COMMENTS	OVERALL RATING
	CRITERIA 1	CRITERIA 2	...	CRITERIA n		
IDEA 1	-	-	...	+ O		O
IDEA 2	+	O	...	+ +		+
IDEA 3	-	+	...	? -		-
IDEA	?					-

2

KEY	
+	Fully satisfies the criterion
O	Possibly meets the criterion
-	Does not satisfy the criterion
?	Not possible to determine suitability

3

The team should then assess each idea against the criteria using the conditions along the lines of those shown above. The session leader should encourage the group to make decisions as quickly as possible to maintain the pace of the session. If no quick consensus can be achieved either take a quick vote on the preferences and enter the majority of that as the result, or enter a question mark.

4

The session is wound up by summing up the totals of positives and negatives. Those ideas with the highest scores showing a net positive balance are chosen as the solution paths which merit further exploration.

D
7

D
7

WORKING WITH EXTERNALS & THIRD PARTIES

1. Introduction

During the course of a product introduction project it is highly unlikely that a team will be self-sufficient. Indeed, teams operated in isolation will inevitably experience problems with introducing the product into the business or organisation. Teams are usually sized according to two criteria:

- ✘ The average predicted resource level
- ✘ The available skills and resources in the business or organisation.

E
3

This means that inevitably during a product introduction activity the team is going to have to co-opt additional resource to meet the workload. This can pose a number of difficulties since the team is now faced with having to delegate work to people who are not motivated in the same way that the team are. Hence care needs to be taken to ensure that the work is done to the same criteria set for the team.

2. Co-opting External resources

Detailed project planning at the start of a project should identify where you will need the support of others. When using third parties the team extended family approach rarely works, instead a group approach has to be taken. The difference between a group and a team is:

TEAM

A collective of individuals **working together** to achieve **common goals** for which they are **mutually** accountable

GROUP

A collective of individuals **co-operating** together to achieve **defined objectives** for which they may be **individually** accountable

Hence in order to gain the most benefit from using external resources you need to establish a set of drivers that encourages them to respond to the motivations of the product introduction team. There are two approaches to managing third parties:

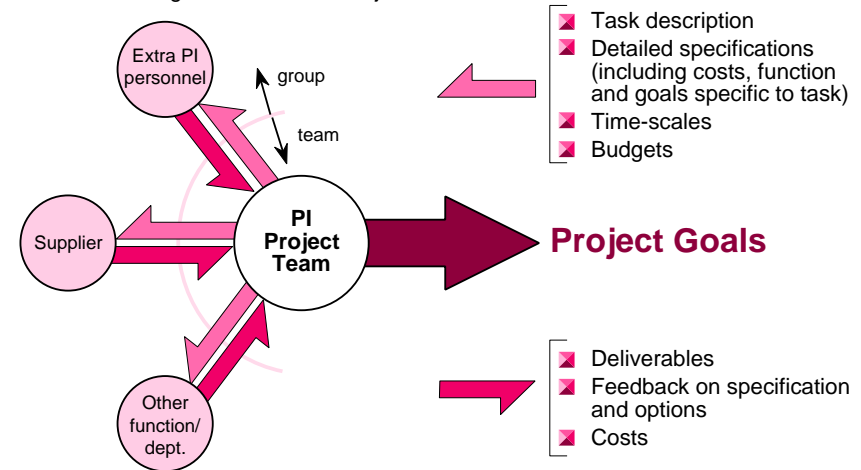
- ✘ **Delegate:** If you are working with people who understand your goals and have a similar background then delegation to an assigned resource can be sufficient.
- ✘ **Contract:** Either informally in the case of other parts of the organisation or formally in the case of third parties.

In practice you will find that a combination of both approaches is needed. In both cases the best approach is to make sure first that the third party is made aware of its role well in advance of when you anticipate that it will be needed and, secondly, to secure agreement for the release of the necessary resources.

The next step is to establish the necessary interfaces between the full-time project team and the co-opted resources. For the project leader a good way of doing this is to ensure that the team is fully on-board with the concept and that it has collective responsibility for seeing that the project objectives are achieved. This then allows the project leader to delegate responsibility for managing interfaces with externals to the team members that have the most empathy with that aspect of the project.

In common with team formation, it is useful to make sure that the specification is both well defined and understood. This does not mean that you should be prescriptive, but schedules and targets need to be understood - as does the ability of the third party to meet them.

Effectively what you are constructing is a number of satellites about the core product introduction (PI) project team. Note that these satellites may, in turn, be teams themselves. Here care needs to be taken to keep all communications consistent and agree the common objectives.



E
3

3. Maximising the Contribution of Third Parties

Ideally it would be good to be able to pass a problem or piece of work to a third party and forget about it until it has been completed. In practice working with third parties is a continuous process and in any resource plan a percentage of time (up to 25% for some team members) may be taken up communicating with and managing third parties. Some useful points for getting the most out of third parties are:

- ✘ Make sure the third party understands what's in it for them - particularly the opportunities.
- ✘ Recognise that product introduction can represent change and the greatest resistance to it is likely to come from within your own business i.e. the allies you assume are there by default could be your worst enemies if not handled properly
- ✘ Remember that a third party's motivation and priorities are set by goals and measures that are not the same as those of the product introduction team
- ✘ Communicate constantly - never let the third party think that they can forget the job or that it is not important to the team
- ✘ Recognise that innovation and ideas can come from third parties and that all dialogue is a two way process
- ✘ Appreciate that third parties may have different approaches to working and solving tasks and that accommodation is required on both sides.
- ✘ Always provide feedback as to the success or failure of a piece of work performed by a third party. It builds goodwill and helps to cement good relationships

FAILURE MODES & EFFECTS ANALYSIS (FMEA)

1. Overview

This is a powerful and rigorous method of analysis that determines the ways that a component, product, activity or process might fail. It works by identifying the possible failure modes of the item being considered and tries to establish and quantify the subsequent effect that would be observed by the end user. It then traces back to determine the likely source of the failure. This in turn allows for corrective actions or remedies to be identified.

A feature which makes this tool very useful is that it quantifies risk. This allows contingencies to be drawn up with clear communication of importance and priority for action. Used correctly, it should significantly reduce the likelihood of failure being encountered by the customer or end user. Some of the applications of FMEA are :

- ▶ Analysing performance & reliability of designs
- ▶ Assessing critical components
- ▶ Identifying weaknesses in production processes or delivery systems
- ▶ Assessing project risks

2. Performing FMEA

The technique is a form based technique that requires the completion of a fairly standard table. Performing the analysis is a group activity. However to keep the exercise manageable, the number of people involved should be limited to ten at most. For complex projects it can be advantageous to conduct the analysis over several sessions focusing on a particular aspects using different groups of experts .

The form of the analysis is logical. Firstly the product is broken down into significant components, sub-assemblies/ systems and features. For each item the following analysis process is repeated:

- 1 The various ways in which the item being considered might fail are identified (the failure modes)
- 2 For each failure mode the effect upon the overall product and the impact upon the end user is identified. At this stage the probable causes should also be established ([Cause and Effect Analysis](#) (section F6) can be a useful tool here).
- 3 Each failure mode is then scored using three parameters:

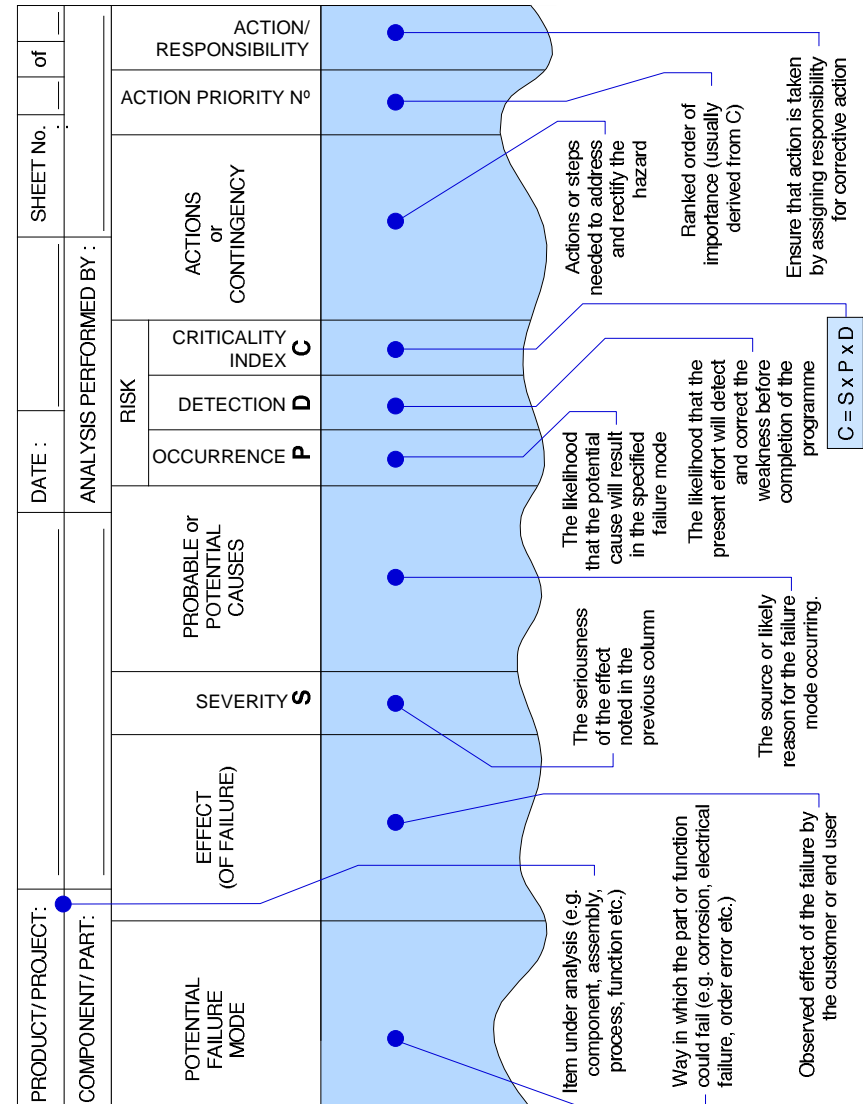
Parameter	Symbol	Rating
Severity or seriousness of the failure to the end user or customer	S	<input type="checkbox"/> minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> major
The probability of the failure occurring in practice	P	<input type="checkbox"/> remote <input type="checkbox"/> <input type="checkbox"/> very likely
The ease of detecting or remedying the failure with the present work effort	D	<input type="checkbox"/> easy <input type="checkbox"/> <input type="checkbox"/> difficult

The scale used is arbitrary so long as the higher the score the greater the threat to the project, design, process or whatever the analysis is being applied to. A useful approach is to rate each parameter on a scale of say 1 to 5, which is then transformed using a logarithmic scale of 1 to 10 (i.e. 1=1, 2=2, 3=4, 4=7, 5=10). This escalates the importance of high risk items.

- 4 The three scores are then multiplied together to yield the criticality index, C. This defines the level of risk associated with a particular failure mode
- 5 Finally, contingency actions and assignment of responsibility for seeing that they are addressed are determined. This activity may be best done when all items have been analysed.

The key to FMEA is **ALWAYS** heed to results of the analysis. Taking prudent steps to mitigate potential future hazards will pay for itself just about every time .

3. Anatomy of a Standard FMEA Chart



CREATING ADDED VALUE IN PRODUCTS

1. Introduction

G
2

Products are usually seen as a foundation from which further services and even additional products can stem. Two words that often crop up in this context are “add” and “value” & can mean a number of things depending upon the perspective being taken. In practice the expression “Value Added” can mean one of two things:

- 1 Additional services offered to the customer to enhance their business, which are capable of earning additional revenue and/or securing a long term relationship with a customer that ensures a secure route to market.
- 2 Procedures and practices in your own organisation that enable you to reduce your own cost base and simultaneously improve the quality of service offered to your customers

To be successful both these definitions of added value need to be pursued. This can be done in the context of developing the business from a re-engineering/ adaptation perspective, however key to achieving added value is to get your foundations (i.e. your products) right to fulfil the aspirations and flexibility demanded by the business.

2. Understanding the Supply Chain

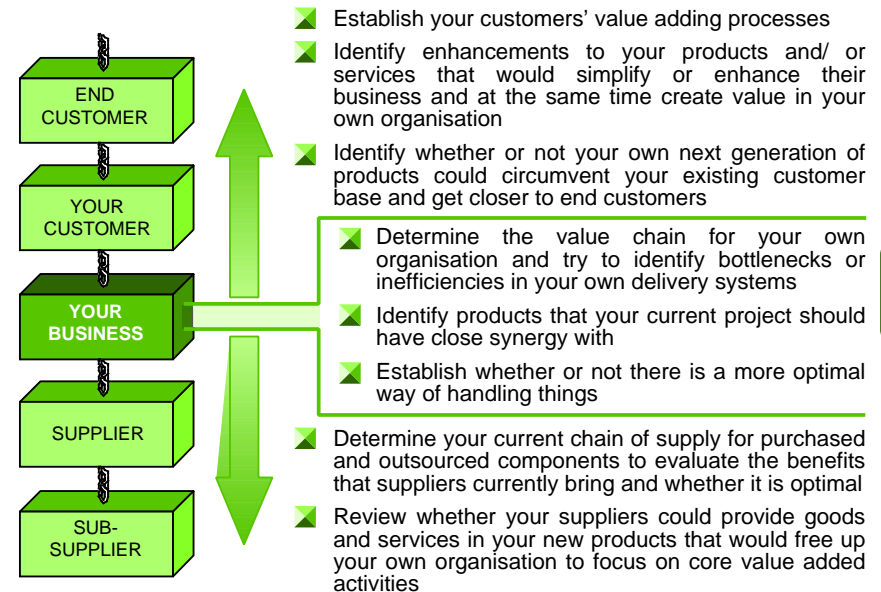
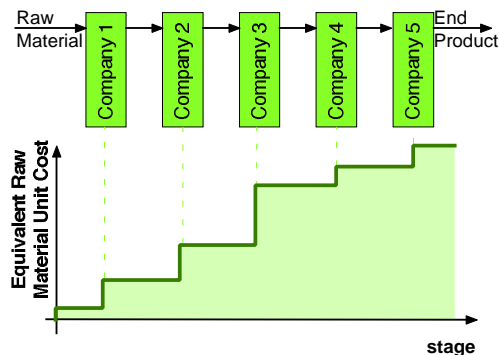
Nearly all organisations occupy a position within a supply chain that extends from the source of basic raw materials through to end utilisation of the final product by an ultimate customer. Supply chains are often complex and as such present a lot of scope for optimisation. Optimisation, here, can refer to both streamlining of a chain and the extent of your company's management of a larger or smaller part of that chain.

In a typical supply chain, all organisations add cost to the base price of the raw material that ideally reflects the cost of manipulating the material received plus a nominal profit. In practice, depending upon an organisations' position in a chain, greater margins are added which reflect the perceived value of the operation performed by a business.

Value in organisational or business terms can be created by one of two means:

- ✦ Providing a service or skill to customers that cannot be accomplished by others (at least to the same standard or protected by intellectual property)
- ✦ Providing a portfolio of services and skills that enable you to provide integrated solutions

Careful analysis of the supply chain can identify opportunities that represent additional business, higher margins or premiums on your products as shown here:



G
2

3. Creating Added Value Through Design

By understanding the food chain, steps can be taken in a product introduction activity to position the product so that the maximum benefit can be derived from it. Some of these steps will derive from existing products and services, others may be identified for near term business growth and should be functionally defined in the project specification. Examples of product design features that can yield added value are:

- ✦ **Modularity or common interfaces**
This can greatly increase the speed and efficiency of tailoring your product to meet a customers' specific needs. Furthermore it conveys a strong image of variety and flexibility.
- ✦ **Integrability**
Understanding how discrete products that you offer can be integrated into larger solutions and adding features that enhance the way your products interact with each other. This can encourage customers to use your business as a one stop source, thus increasing the amount of business generated per customer.
- ✦ **Appearance/ ergonomics**
When a customer is faced with the choice of two products that equally satisfy functional requirements, the appearance or user friendliness of a product can be the deciding factor.
- ✦ **Customer specifiable features**
Allowing the customer to choose details of final appearance such as colour scheme or interface can sometimes be offered at very little incremental cost. However your delivery systems need to be designed to cope with this.
- ✦ **Incorporating diagnostics**
This can assist customers to identify or even anticipate problems and at the same time provide information that supports a service/ support capability.

CHANGE MANAGEMENT

1. Introduction

H
2

It is highly likely that the organisation you work in will be undergoing a process of continuous change as it adjusts or modifies its activities in response to market, regulatory or competitive pressures. This type of change is usually easily digested. Change can also be discrete particularly where a radical change in practice is required. Achieving this type of change is a far higher risk activity since a significant shift in performance, practice or thinking is required. Introducing new products into your business is more likely to be an exercise in the latter. The more complex or radical the product the harder this can be. Nevertheless even something that could be considered an incremental design change may need to be managed with care - particularly if changes in working practices aimed at improving returns are proposed.

During the development process, a product introduction team should develop a working model of how the product should be managed by the organisation. The problem with designing any change is that it is normally done on paper and disregards the people who will actually have to undergo the change. Ultimately change management is the art of people politics. It includes aspects of management, education, persuading, smoothing, arbitration and compromise applied at all levels in the organisation.

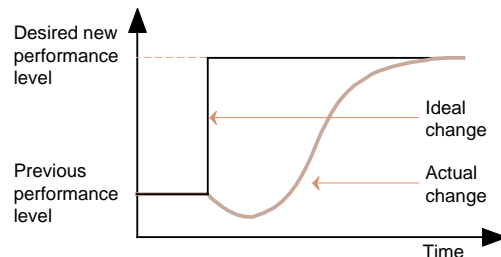
2. Impact of Change

Change rarely goes smoothly. Upon being faced with change people usually respond with a number of personal questions:

- ✘ Why is it necessary?
- ✘ What is in it for them?
- ✘ Are there any threats implied by this change?
- ✘ What support/ resources will they get to effect the change?

Change can be difficult to initiate, but once started do not expect to retain control of it. It is important to remember that people are usually happier with routines onto which they can establish their own identities. In implementing changes that require people to develop significantly different patterns of behaviour or practice a period of settling must be allowed for.

Likewise most people can only cope with a certain amount of change at once, hence ambition may need to be tempered with practicality. The only way to achieve radical change is to take a green field approach - something that most businesses do not have the luxury of being able to do.



3. Underlying Reasons for Change

There are three primary factors underlying the need for change. Any decision to instigate change should fall into one or more of the following categories:

✘ Increase in Efficiency

Improving the yield achieved with the same or reduced level of resources - often associated with the availability of new technology. This is an internally focused activity with emphasis on streamlining the delivery process.

✘ Improvement of Effectiveness

Generating an increase in quality of the output without incurring additional cost. This is an externally focused activity with emphasis on increasing customer satisfaction.

✘ Adoption of New Technology

The availability of new technology itself may necessitate significant changes in practice.

H
2

4. Effecting Change

1

Create Stakeholders

- ✘ Ask yourself what is in it for the people who will be affected? Try to see things from their perspective
- ✘ Develop the foundations that support and justify the change (understand the current status quo and build from there)
- ✘ Pose change in terms of benefits to operative personnel

2

Communicate

- ✘ Build up an expectation of change
- ✘ Make sure the concepts behind the change are understood by all
- ✘ Keep communicating. Do not allow the rumour mill to create false ideas

3

Deliberate Carefully, Act Promptly

- ✘ Engage in a consultative process
- ✘ Implement the change as quickly as possible, but gauge the people carefully to allow time for them to adjust and adopt

4

Be Flexible

- ✘ Build up a road map that lays out where the start and finish is but allows people to choose their preferred route
- ✘ Stick to the major issues yield on the minor

5

Choose Leaders and Change Agents

- ✘ Identify those who will support and drive change
- ✘ Use them to convince others to embrace change

6

Secure Commitment

- ✘ Ensure that senior management fully understand what is proposed and that there is unanimous agreement
- ✘ Secure majority support at operational level for proposed changes

7

Maintain Momentum

- ✘ Implement measures to ensure that change is effected
- ✘ Regularly review change to allow refinement and adjustment

