



Universität Paderborn

Diplomarbeit

**A Product Management Concept for an IT Solution Provider in
Financial Services**

**Role and Responsibilities of Product Managers in Software
Businesses**

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ABSTRACT

This diploma thesis, based on an on-site case investigation made for Deutsche Bank's Global Technology Services Centre of Competence in Barcelona (Spain), examines the role of software product management and its implementation to the requirements of a meanwhile independent IT subsidiary (DB Servicios de Consultoría e Informática S.A. - "dbsci"), which faces a new challenge by offering their financial IT solutions and products to external clients. The partner in this study is experiencing substantial growth in a highly competitive and complex business-to-business (B2B) environment, and has to cope with significant organizational transpositions.

The study deals with this challenges by presenting a software product management concept to "dbsci" (already done in July in Barcelona), describing different key processes for software product management, and finally giving recommendations which alternative could match the needs best. A special emphasis lies in the development of new products and their commercialisation which includes the business aspects like the managing of the marketing mix, the software product life cycle, or the often underestimated branding issues in the high-technology environment.

Characteristics of software producing companies include technology and market uncertainty, greater product and process sophistication, increased research and development intensity, and a large proportion of technical employees. With rapidly evolving technology, shrinking cycle times, 'time-to-market' pressures, and a shortage of software professionals, effective product management is one of today's greatest challenges in the high-technology industry. Developing a software product that customers do not want to buy for example is a recipe for disaster.

Implementing software product management is supposed to help "dbsci" to achieve the set business goals. Product management helps to establish a customer orientation throughout the company, and has to manage interfaces both internal and external. It is in the nature of product management that it comprises a large variety of tasks and permutations and that there is no common knowledge or perception what are the best practices for software product management. Therefore this thesis has to focus only on some good practices to give a general overview of product management "philosophy", but "dbsci" the most effective and efficient approach to work with this concept.

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ROLE AND RESPONSIBILITIES OF PRODUCT MANAGERS IN SOFTWARE BUSINESSES

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LIST OF ABBREVIATIONS

B2B	-	business-to-business
B2C	-	business-to-consumer
DB	-	Deutsche Bank
dbsci	-	Deutsche Bank Servicios de Consultoría e Informática
CEO	-	Chief Executive Officer
e	-	electronic
IT	-	information technology
NPD	-	New Product Development
PDMA	-	Product Development and Management Association
PLC	-	Product Life Cycle
R&D	-	Research and Development
ROI	-	Return On Investment
S.A.	-	Sociedad Anónima
WAP	-	Wireless Application Protocol

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**ROLE AND RESPONSIBILITIES OF PRODUCT MANAGERS IN SOFTWARE
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1. INTRODUCTION

In a rapidly changing marketplace with pacing technology, 'time-to-market' pressures, and demands for shorter product life cycles the result is a highly competitive environment. Software business is acting within this competitive environment and even accelerate rapidly changing business surroundings. There are few industries today as dynamic as the software industry. Companies and software products seemingly emerge and disappear almost overnight. One result of this fast moving environment among most software manufacturers is the widespread corporate problem of lacking proven and experienced organizational structures and processes. Looking on these apparently unstructured processes and rapidly changing responsibilities within software developing companies, both corporate insiders and outsiders easily can get the impression of chaos that requires improvement and guidance.

To make a successful software product it requires more than just a good code or a talented sales force. Before, during, and after software coding the discipline of product management helps to create, guide, and position a product to success, and help to keep it there. The function of product management represents an essential business discipline and promotes efficiency, effectiveness and teamwork throughout the company. "Management is often described as the art of getting things done."¹ Product management is about leading products and people, and about finding unsolved problems in the marketplace and creating solutions to these problems. Software product management is even harder than the development of many other products because of its extreme flexibility² Software product's ability to go from development processes to market almost literally overnight, a multitude of unstructured development practices have arisen and survived tenaciously, regardless of the knowing of most participants about their negative effects. Due to this 'time-to-market' pressures important marketing processes and business impact techniques are neglected or ignored.

¹ See [Garvin 1998], p. 43

² See [Tessler / Barr 1996], p. 2

The strategic decision of a software coding firm to implement an appropriate product management concept promises a good practice solution to solve current corporate problems in respect to unstructured organization, processes, and responsibilities. It helps to set up a more guided framework within the company, and further than that it provides a business approach to reach the customers and their satisfaction more effectively.

Many people do not know what product management stands for or understand its role in an organization. The product plays a central role in business management. "Mismanagement in this area is unlikely to be compensated for by good management in other areas."³ Product management is among the most challenging and important positions in business with full strategic and financial responsibility for assigned products and services, product lines, or product groups. Product managers manage the total effort for their products in a highly competitive environment throughout their life cycles. That includes chiefly the phases of development, positioning and launch, and the product's maintenance. They must know which strategies and tactics will achieve maximal growth at minimal costs. Besides, they must have strong managerial skills, as they are the epicentres of links, networks and interfaces. Both internal resource managers' decisions and external customers' perceptions of the product will have impact on product performance and product manager's work.

Many modern companies are functional and hierarchical. They suffer from isolated departments poor coordination, and limited lateral communication⁴ between marketers and their functional counterparts in research and development (R&D), production, or logistical support departments. At times, conflict occurs when each function interprets business objectives and strategies differently. To minimize conflict, it is important for the success of any company to establish a clear delineation in organizational framework, and by creating informational exchange channels. Assigning responsibility for a particular product to a specific product manager can be very advantageous for conflict solving, because product managers should act as the integrators within the interfaces.

³ See [Chernatony / McDonald 1992], p. 1

⁴ See [Garvin 1998], p. 33

1.2. SCENARIO

The financial services industry is under increasing pressure to satisfy corporate and private customer requirements for automated, efficient delivery of information and transaction services. Financial services as a term includes banking, brokerage, insurance, building societies, and trust companies. The challenging financial landscape of the last decade and the new millenium, particularly related with emerging high-technology electronic ("e") solutions and information technology (IT) services, requests a widespread human engineering and an adjustment to fulfil the expectations of a highly informed market.

Financial IT solution provider respond to this market direction. Some key players in this forward-looking business are the software sub-units of IBM⁵ or Andersen Consulting⁶, and specialists like S1⁷ or Brokat⁸. The Spanish IT subsidiary of Deutsche Bank AG, namely DB Servicios de Consultoría e Informática S.A.⁹ (in the following "dbsci"), has already full project and product experience in this marketplace, but only as a supplier of financial IT integration to other subsidiaries of Deutsche Bank Group in Europe. The company intends now to offer its products and services to external clients in a fast growing market.

According to a current Pan European e-banking review made by the American investment bank Merrill Lynch, established banks need to change by re-engineering the banking business based on IT, and pure e-banks have to change in order to access the massmarket by improving their level of service, as pricing is not enough to penetrate the mass market.¹⁰ The analysts of Merrill Lynch also expect that competition increase across the industry. New entrants to the marketplace like life insurance brokers or car manufacturers' banks are emerging, and attack the financial market. All these companies are potential customers of financial IT solutions like channel transactions via the internet, back office restructuring, or the way banking products are sold and the way the banks interact with their customers. A white paper of the consulting firm Arthur Andersen states that especially the financial services segments e-brokerage and asset management¹¹ will be the first keys to success in online banking applications.

⁵ See [<http://www.ibm.com>]

⁶ See [<http://www.ac.com>]

⁷ See [<http://www.s1.com>]

⁸ See [<http://www.brokat.com>]

⁹ See [<http://www.db-sci.com>]

¹⁰ See [Merrill Lynch 2000], p. 3

¹¹ See [Arthur Andersen 2000], p. 11

"dbsci" has the ability and the expertise to play a key role in the described arena. Products and product-based services are already successfully integrated into working applications. The firm is able to provide any IT-related service to its potential new external customers. To set-up a customer-oriented and market-/marketing-oriented organizational structure and philosophy throughout the company, the establishment of the function of software product management will help "dbsci" to reach the set goals.

1.3. CONCEPTUAL FORMULATION

This work's goals are to characterize the nature of software product management, that includes all relevant management processes throughout the software product's life cycle, and to implement the findings to the requirements of the financial IT solution provider "dbsci". Readers will gain an understanding of key software product management success areas and processes, their general application in software businesses, and how the presented processes can be introduced to a specific software producing company.

Searching for literature to software product management is not an easy task. Academic and business writings in relation to software product management focuses chiefly on development issues, information respectively is still hidid by specialized consulting firms to earn money. Maintaining software products competitive is rather under-investigated. This thesis is not meant to be exhaustive in its coverage of the depth of the academic product management related literature, but it will provide a broad range of common software product management processes.

The work is subdivided into five chapters: an introductory part, key considerations to product management, key processes of software product management, a case study, and final conclusions. Key considerations to product management include a general overview, the product manager's role within the company, and the implications of the software product life cycle to the management of software products. The chapters three and four are the main parts of the thesis. To understand the roles and responsibilities of software product managers it is necessary to have a look on processes of software product management. The author has decided to begin the processes presentation with the (marketing) managing of existing products, because it is the first need of the partner in this study and has also subchapters, like implications of the product marketing mix (3.1.1.) or opportunity identification (3.1.3), that have impact on all parts of product's

life. The second part of chapter three deals with the important product management task of managing new development projects. There we have the transition to the third part dealing with managing conflict in development and improvement teams, and the way in which product management is defined in software businesses. A special focus is laid down on marketing's limited role in software product firms, and the important interface with R&D.

Chapter 4 deals with the introduction of software product management into the organization of "dbsci". The action taken here is: (1) establishing the mission for the organization, (2) identifying organizational issues that should be considered in the design and maintenance of a contemporary, customer-focused product management organization, and (3) selecting the organization structure that best supports the product management function in carrying out its mission. After recommend an appropriate product management concept that affects the whole organization chart of "dbsci", the product "online brokerage access solutions" is used to provide a preliminary guideline of an assigned product manager's task for an existing product. The thesis concludes with an evaluation of the proposed concept, product's measurement, and product management's 'pros and cons'.

2. KEY CONSIDERATIONS TO PRODUCT MANAGEMENT

2.1. GENERAL OVERVIEW

Companies who succeed in the demanding and challenging software environment are the ones that take their products to market efficiently and effectively. Products are the centerstone of every producing company. The purpose of product management in its variety of forms is usually the complete responsibility for a product, product line, or service from birth to death. It is the dedicated management of a specific product or service to increase its profit contribution from current and potential markets,¹² and an essential business discipline to achieve all expectations for products to survive in the market. In practice, functions of product management range from product strategy to business management to project management, and include job titles and responsibilities of positions commonly referred called product manager or program manager. In consumer markets often times the function is equally named to brand management, but it comprises more than that.

Product managers must be product and market strategists with tactical skills and techniques, functional capability experts and business managers, as well as matrix leaders for development and marketing. They employ rather a general management for their products than a solely marketing or technical approach, that implies a mixture of special focus on the market, customer, and technical knowledge. They are important decision maker who are responsible for development, pricing, advertising, and sales promotion of one or more products.

In large companies, the overall product management function is often broken down into several roles, including inward-focused product planning and engineering guidance, and an outward-focused marketing and business management role with several more specific day to day projects. In smaller companies, responsibilities of product, program and project management are often combined into a single product manager role.

There is a considerable debate in literature and practice, and a lot of misunderstanding and misinterpretation concerning the definition of product management. Especially authors who are engaged in brand management complain that product and brand

¹² See [Handsombe 1989], p. 4.

management are often mixed up.¹³ Davidow¹⁴ finds it even unfortunate, that too many people are wearing the title product manager, although they do not execute the role correctly. In respect of such discrepancy and for the purpose of this investigation the author refers to the definition of Handscombe¹⁵:

"Product management is the dedicated management of a specific product or service to increase its profit contribution from current and potential markets, in both the short and the longer term, [...]. Effective product management is a practical, purposeful and positive approach to improving company results through the efforts of a competent and committed team coordinating and progressing the development, manufacture, marketing, sales and sales support of a strategically important group of products. [...] Involved in all aspects of the business, the manager has to put special focus on the market and the customer."

Managing products has undergone several changes since the concept was first introduced¹⁶ and is still in the process of change. The concept began as a management style used by leading consumer product companies. It was developed in the early 1930's by Procter & Gamble Co. (P&G) to improve management effectiveness on a growing line of products in the soap and detergent arena. Today the concept is used world-wide, and browsing the internet with the keyword "product management" it seems that especially in high-tech and software companies it has become a dominant form of organization structure in the last decades.¹⁷

The function of product management has many possible permutations and is implemented in different ways within the different companies. One product manager is working in a business-to-consumer (B2C) company focused chiefly on branding and positioning matters for a huge market, the other is working in a business-to-business (B2B) setting where the main objective can be to cultivate a smaller group of customers very well. One could be labouring in solely marketing related questions and another is focused more in development processes. Each of these different options can be effective under certain circumstances and, vice versa, less effective under other circumstances.¹⁸

¹³ See for example [Chernatony / McDonald], p. 8.

¹⁴ See [Davidow 1988], p. 149.

¹⁵ See [Handscombe 1989], p. 4.

¹⁶ See [Buell 1980], p. 339.

¹⁷ See diverse job offers in internet and newspapers.

¹⁸ See [Handscombe 1989], p. 11.

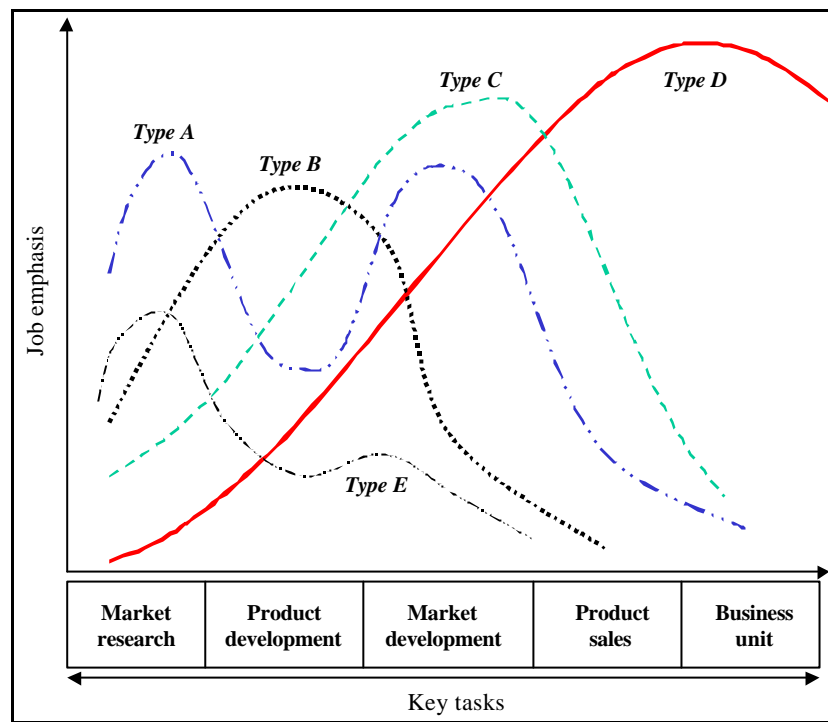


Figure 1: Variations of different product management approaches
 Source: Adapted from [Handsome 1989], p. 11.

The various curves in figure 1 represent different product management approaches implementing in several ways in different businesses.¹⁹ Type A stands for the typical consumer product manager involved primarily in market matters and needs. Type B describes product management in the new product development process (NPD). Type C is typical for an industrial product company, providing the key link between the development of corporate strategy and sales activity. The ultimate level of product management is representing the type D. This is the profit-centre business-unit approach that has become popular as an organizational philosophy in recent years. Type E represents the young assistant without much experience.

The roles are outlined to assist the implementation process in order to take into account a variety of options before deciding on the most helpful role for a firm's specific organizational situation. They consider the benefits and risks of common overlapping between the different types of product management that might exist. Equally the figure helps to establish an appropriate training and recruitment program for product managers.

Likewise to the different conceptions of product management, there is equally confusion and ignorance the term marketing stands for. Due to the often usage of this term in literature, practice, and in this thesis, the author defines marketing as a whole. It is the way of managing a business and products, so that each critical business and product decision is made with full knowledge of the impact it will have on the customer. It puts the customer at the centre of the organization. Marketing is defined by Handscombe as the

"corporate activity with first, the identification of [...] customer needs in those priority business areas and territories defined by the overall strategy of the company, and second as the development and promotion of products and services which meet those needs in a manner acceptable to the customer, at a realistic price and [...] supported by the market function."²⁰

According to this definition the position of product management within any company should be at least a near marketing function. In any case, product management should be conscious of marketing instruments and marketing orientation.

2.2. THE PRODUCT MANAGER'S ROLE AND MAIN INTERACTIONS

The role of product management is positioned to achieve customer satisfaction by acting as the customer advocate to the team and as a team advocate to the customer.²¹ Further than that, and due to the crucial role during product conceptualization and development or marketing management, the role is established also to manage the inter-functional interfaces within an organization. He or she should act as inter-departmental coordinator with research and development (R&D), engineering, manufacturing, sales and other business functions depending on the unique organizational structure within the firm, and how the function is implemented.

Below are two figures describing several interactions and contacts a product manager is faced to without going into greater detail. Figure 2 (a) shows generally company areas that are having most impact on a product manager's work. Figure 2 (b) represents an investigation realized by a Spanish business school²² to see to what degree the work is characterized by contacts with other areas of the company and customers. Working product managers were asked to rate their corporate contacts from 0 (no contact) to 5

¹⁹ See [Handscombe 1989], p. 11.

²⁰ [Ibid. 1989], p. 88.

²¹ See [<http://www.microsoft.com/technet/Analpln/team.asp>].

²² [ESADE, 1997]

(great contact). It was observed that the main contacts have been the ones to sales force, R&D, and customers. The figure shows the rating by averaged points.

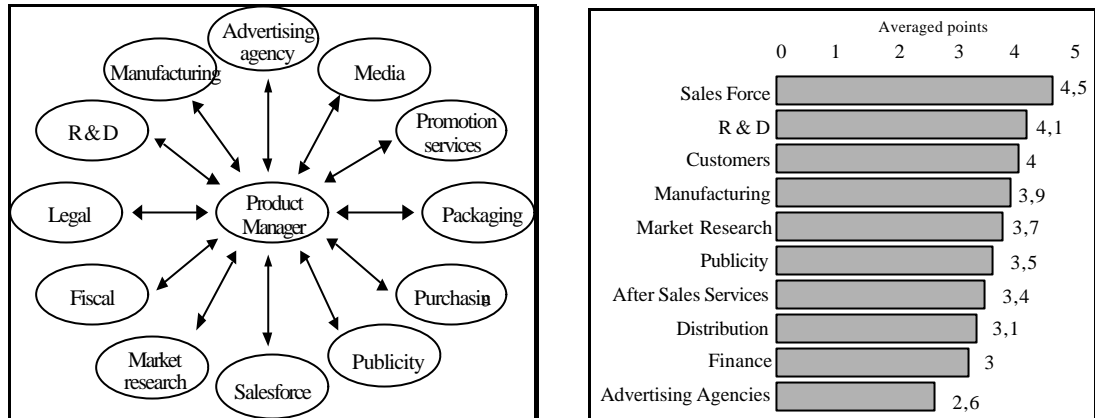


Figure 2 (a)/(b): Interactions and most time-consuming contacts of Product Management

Source: See [Aymerich / Tarragó 1997], p. 27.

The product manager is expected to work with all parts of business, on a cooperative basis, to insure that everyone is pulling together to achieve agreed upon corporate business goals. The role is fundamental to company success once it is established and working. Establishing standard roles and responsibilities for product management cannot be overstated. The appointed people are not the only ones who need to understand their roles, the entire business needs to understand and support them. If other functional groups have issues with the function and its role and responsibilities, there will always be questions about execution.

In the following the reader will find the most important interfaces a product manager has to manage, as the case may be how his work is influenced by crucial areas of the corporate environment.

2.2.1. THE SENIOR MANAGEMENT INTERFACE

First of all the strategic decision to implement the product management concept to a company requires a strong patronage on the part of senior management (Board of Directors). Product management will normally have more support from the other functional corporate areas than if it seen not to be only an important feature of the organization structure of the marketing department. This is mandatory that the concept works effectively.²³ By handing over product responsibility to several product

²³ See [Handsombe 1989], p. 126.

responsibles and therewith a crucial factor of business success, it is understood that the Board of Directors must be involved in decisive strategies concerning the products. The operation of product management is affected by several types of corporate strategic decision, made by or requiring the confirmation of senior management. These types²⁴, apart from the organizational set-up of the company, are to establish a participative and integrative strategic planning process, to make investment appraisal strategic, objective and realistic, to require business plans to support major investments, and to establish disciplined divestment analysis and decision-making.

Product managers have to prepare and present their elaborated business and investment plans in order to get project appraisal and approval. The product manager prepares product strategy, annual plans, budgets and reviews. Then these plans are submitted to corporate senior management for review to assess and finalize decisions on priority corporate investments.

2.2.2. THE MARKETING INTERFACE

Per definition product management is a marketing function with strong technological expertise. The function is typically found in reporting line to the marketing manager, but is much more than "solely" a marketer in a common sense. Therefore there is an interface to have in mind. Successful marketing requires a commitment at all levels to an agreed definition of what is entailed. Every member of the staff needs to know what marketing is all about, and the part he or she can play. Depending to the specific role the product managers play in a company, they even would be in direct responsibility for marketing and are acting like marketing managers. As above mentioned it belongs to every organization how to implement the different concepts of the role. Supposed that there is an autonomous and strong marketing department within the firm, product management has to interact with this area. Having in common the same objectives like e.g. improving product competitiveness, sales productivity or financial results, the product manager is in use of marketing knowledge, experience, techniques and skills to reach this objectives. A strong emphasis is put on cooperation with market research which provides product management with essential information concerning opportunities, needs and targets in the market.²⁵

²⁴ See [Ibid. 1989], p. 127.

²⁵ See chapter 3.1.2

2.2.3. THE SALES AND CUSTOMER INTERFACE

Selling is a fundamental part of business. The product manager has normally a vital and full role in both directing and supporting the sales force. It includes for instance the organization of product briefings, improving the image customers have of the product, or securing improvements in the product or service package. The purpose is to ensure that the sales force spend less time thinking about what to sell, how to sell, where to sell, and whether the customer will get what was ordered when required, and can concentrate on servicing customers. The product manager has a joint accountability for profit contribution with the sales manager, and needs the right kind of relationship in order to be able to operate, be accepted and supported as a product champion.²⁶

Especially in high-tech markets with complex products and services to sell, product management is essential to sales support. The function is very helpful to sales staff on certain customer visits to explain the technical features of the product more professionally than a sales representative could do this. If engineers do this sales support the sales manager is in the possible danger to lose the professional appearance he has to have, but could not perform with lacking technical expertise.

2.2.4. THE RESEARCH AND DEVELOPMENT INTERFACE

The interaction with exclusively technology-oriented personnel can be source of conflicts and misunderstanding. The company's drive for successful products is often "thwarted by weak working relations between R&D and marketing".²⁷ Marketing and engineering functions often favour different trade-off strategies,²⁸ based on their different perceptions of both the market environment and the end user expectations. Due to the intrinsic prerequisite of business opportunity on part of product management, and the different culture²⁹ by scientists and technicians preferring to work without much supervision and accountability, the company has to find a balanced approach to connect this interface.

Especially in new product development (NPD) the clear definition of limits and competencies of the functions is vital to be successful. The use of cross-functional

²⁶ See [Davidow 1988], p. 190.

²⁷ See [Kotler 2000], p. 690.

²⁸ See [Tessler / Barr 1996], p. 3.

²⁹ See [Frankwick et al. 1994], pp. 183 – 195.

teams with a recognized team leader is central to successful NPD. In this case, the product manager is or can be the leader. If there is no designated team leader, the team will experience sustained development intervals and suffer confusion when decisions need to be made. Each team member plays within this process a critical role. If any functional group does not provide input and commitment to support the project, the project risks increase. The product manager as a team representative needs to be empowered to make decisions for business.

Due to this essential and important interface of product management the relationship between R&D and marketing is worth to be scrutinized more in detail later in this paper.

2.3. SOFTWARE PRODUCT LIFE CYCLE

The product constitutes the central force in a company's strategy. The ability of a firm to put together a line of products and services that provides superior value to customers is the heart of business marketing management.³⁰ A product is anything that can be offered to a market for attention, acquisition, use, or consumption, that might satisfy a want or need. Products can be physical objects, services, people, places, organizations, or ideas. The Product Development and Management Association (PDMA) explains the product as a term used "to describe all goods and services sold. Products are a bundle of attributes (features, functions, benefits and uses) and can be either tangible [...] or intangible [...] or a combination of the two."³¹ McDonald³² describes that a product is a problem solver, i.e. it solves the customer's problems. Kotler³³ suggests that three distinct elements need to be considered: the product's attributes associated with the core product, its benefits that consumers perceive as meeting their needs, and the nature of support services what the organization provides in addition to the core product.

Software products are created to provide computable solutions to real-world problems.³⁴ Special challenges and enticing opportunities confront the product strategist in high-technology software markets. The responsible persons have to know

³⁰ See [Hutt / Speh], p. 288.

³¹ See [<http://www.pdma.org/glossary.html>].

³² See [McDonald 1984], p. 63.

³³ See [Kotler 2000], p. 446.

³⁴ See [Alonso et al. 1996], p. 65.

that every software product like an end-user application, a programming tool, or an operating system, as well as every other product has a limited life. There are few models available to the software manager which adequately describe the differences in the managerial and technical approaches which could be adopted in different development and maintenance situations. The generally accepted product life cycle (PLC) concept can be used as a guide to technology development, forecasting, and opportunity identification.³⁵ The concept is used as a model for considering the implications for product management of a product passing through different stages within its life. It provides at minimum a framework that no service or product has an unlimited lifetime demand.³⁶

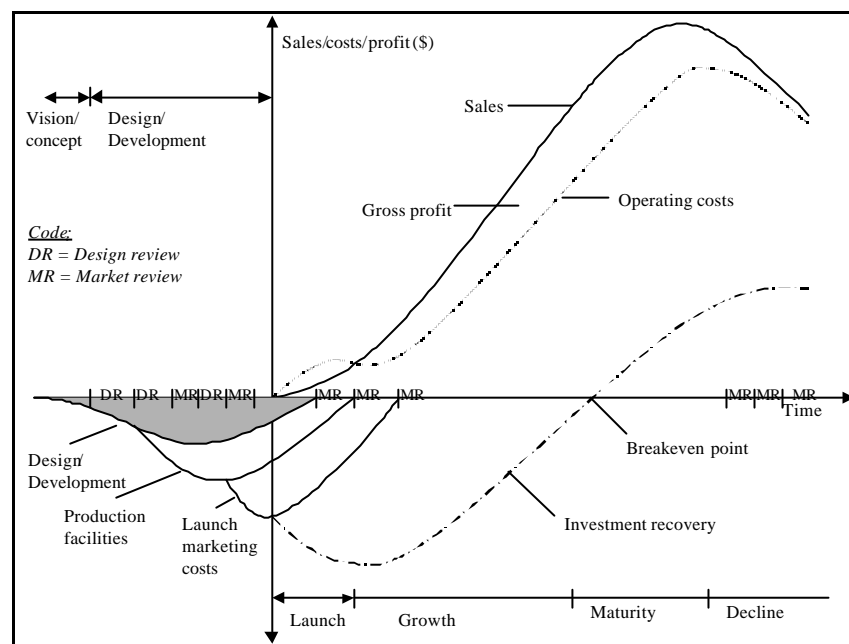


Figure 3: Product Life Cycle - Product Management Financial Perspectives

Source: [Handsombe 1989], p. 43.

The life-cycle concept is a "cradle to grave" model to thinking about products, processes and services. Software product's life cycle is often described by two discrete processes, namely an initial development process and a maintenance process, the latter commonly approaching two thirds of the product life-span.³⁷

Figure 3 presents the PLC model which segregates the life cycle of a product or service into six different stages. Phase one is the concept or vision phase in where a business, product / service, or market opportunity is identified and conceptualised. In the second phase the product ideas are progressed through detailed market research, design-

³⁵ See [Souder / Sherman 1994], p. 77.

³⁶ See [MacNamee / McDonnell 1995], p. 122.

making and development procedures. Phase three is the launch of the product / service following the planning and preparation of the second phase.. The growth phase (4) is the result of marketing and competitive advantages. If the product is well accepted it should generate in this phase its maximum return on investment (ROI). The maturity phase (5) comes when sales are slowing down. Phase six is the decline phase where the product loses its competitiveness and it is necessary to replace the product by up-dates, new technologies, or the complete retraction. Although reality and practice show that the theory need to be seen as a modified series of a cycle.

The theoretic model principally focuses on the financial impact a product has during its life and tries to show that is essential that a product needs to perform rapidly the cost-neutral point, the so-called breakeven point, where sales cover operating costs.

The product life cycle is not an independent phenomenon, it also belongs to uncontrollable changes in the market environment. But generally it is observed that the above mentioned six phases are typical. Especially in the software environment where product life cycles become shorter and companies large and small need to generate a constant flow of successful products to be competitive, the figure gives an idea what software product managers have to consider about the nature of products. Software products and software related services have to be managed professionally from the visionary concept stage until the product or service is eventually taken off the market in the decline phase. This necessitates a professional work that includes a product development program with specific review on this program, monitoring and controlling the product's objectives, plans and strategies, budgets for the important growth phase, or the implementation of which is directed with the vital mix of success criteria like motivation, inspiration, discipline and control.

Software product management utilizes the information gathered from life cycle studies to identify ways to reduce costs, increase market share, improve strategic positioning, or modify the constraints of operations, all that with the goal of increasing company profitability. Professional management of PLC's is supported by business or product action plans which comprise in addition to specific strategic decisions and operational processes as well the risks every product contains.

³⁷ See [Hinley 1996], p. 723.

3. PROCESSES OF SOFTWARE PRODUCT MANAGEMENT

Processes can be defined as systematic approaches that are performed to achieve specific purposes.³⁸ The function of software product management is filled up with processes, because of its crucial role for the company's success.

3.1. MANAGING MAINTENANCE OF EXISTING SOFTWARE PRODUCTS

The maintenance of a software product comprises about two-thirds of a software product life cycle. Clearly, the maintenance processes are important in terms of budget and software quality from the perspectives of customers, users and the software product manager. The evolution of a software product and its support throughout its entire life provides not only an opportunity for continued product quality, but for incremental improvement to the software maintenance process and dissemination of better working practices. The need to manage existing software products is reflected on the following definition of software maintenance: "Software maintenance is the set of both managerial and technical activities that ensure that the IT function continues to meet organizational and business goals in a cost-effective matter."³⁹ For the purpose of this paper we use the term maintenance especially for the evolution, the improvement and the management of existing software products, and how to create more value for the customer. A marketing guided approach to this maintenance processes is helpful for software product managers. Figure 4 illustrates a framework for software product marketing management.

The framework for software product marketing management can be applied for the maintenance of existing software products. It describes the necessary action to be taken by product managers to deliver the assigned products to the market. Parts of this model will be described in this subchapters. Others will follow by the presentation and definition of product development belonging processes.

³⁸ See [Whitten 1995], p. 15)

³⁹ See [Layzell / Macauley 1990], p. 1131.

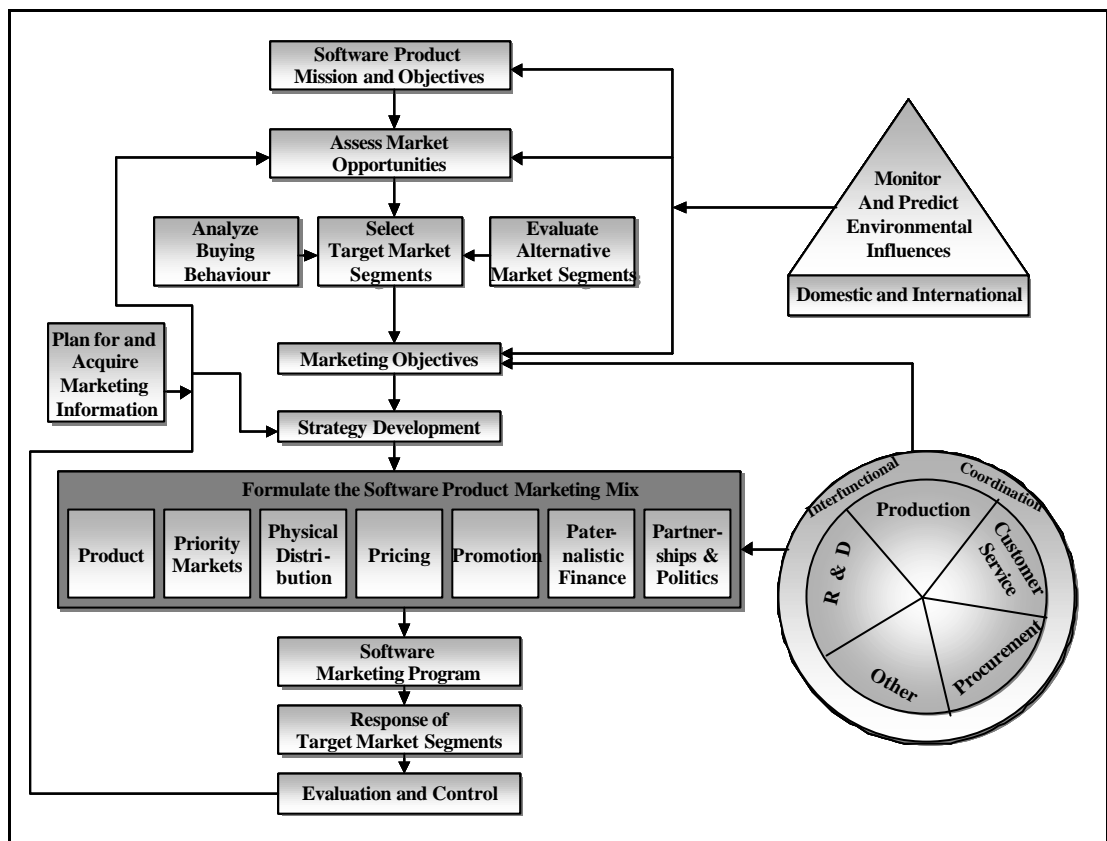


Figure 4: A Framework for Software Product Marketing Management
Adapted from [Hutt / Speh 1998], p. 553

3.1.1. Implications of Marketing Mix

A common tool for managing maintenance processes of existing products is the application of the marketing mix. The application of the marketing mix⁴⁰ is not an exact science and requires commercial creativity and judgement for success.

The product marketing mix - with its main constituent elements product, price, placement and promotion popularised by McCarthy in 1981- investigates the problems inherent in uniting these different elements of marketing into unique and distinctive combinations. Handscombe suggests to extend the four "P's" to more helpful framework that covers the demands of a "more competitive and international marketplace"⁴¹ by adding physical distribution, paternalistic finance, partnerships and politics. He also outlines the typical and different contributions to the marketing mix of product managers, marketing services and sales force.

⁴⁰ See [Kotler 2000], p. 681.

⁴¹ [Handscombe 1989], p. 96.

As illustrated in table 1, the decision-making process within the product marketing mix is led and coordinated by the product manager, but in practice shared with other members of the product teams, i.e. marketing services and sales force.

Aspect of marketing mix	Product Manager	Marketing Service	Sales force
Product Package	Definition of product and management of product development plan	Market research support	Market intelligence on customer needs and competitor activity
Priority Markets	Choice of priority territories, market segments, and customer groups	Market research support	Choice of priority customers within segments
Physical Distribution	Choice of profitable and secure direct or indirect distribution channels	Advice on historic, current and future options, and company practice in other product groups	Personal sales activity and sales support to appointed agents and distributors
Pricing Policy	Definition and communication of policy guidelines for product pricing, discounts and trade terms	Advice on compatibility of proposed policy with general company policy of other product groups selling the same or similar customers and markets	Sales to specific customers at net prices within policy guidelines
Promotion	Development of corporate promotional programs and guidelines for local promotion by regional sales force and foreign subsidiaries	Support in development and implementation of promotional programs	Use promotional activity to improve productivity of sales activity plus local promotional activity where appropriate
Paternalistic Finance	Definition / development of financial packages to aid product sales	Assistance in development and servicing of financial packages	Objective use of financial packages to secure difficult but strategic sales
Partnerships	Consideration and establishment of collaborations to secure accelerated development of product range or market for products	Support in analysis, negotiation and servicing	Possible assistance in choice and support to established collaborations
Politics	Consideration of opportunities for obtaining government support for products in terms of trade barriers, national standards, quality awards, etc., to raise or overcome import barriers	Support in identifying, evaluating, lobbying and negotiating political support	Support to product managers in implementation of policy

Table 1: Contributions to the management of the marketing mix

Source: Adapted from [Handscombe 1989], p. 97

To find the mix that creates the greatest market leverage for the least expenditure on each phase of the product life cycle is fundamental to the development and implementation of a marketing plan for a product or product line that is both profitable and competitive. The product marketing mix is present in all product management processes including software development, and stands therefore at the beginning of the processes presentation. It will be shown that the application of the marketing mix is of extraordinary importance during strategic and tactical product launch decisions, but it is as well important for the maintenance of existing software products.

Marketing mix decisions impinges on product success in every stage of the life cycle. Although their nature is tactical, the four key elements product, price, distribution (placement), and promotion have effects on opportunity identification, strategy, development, launch and maintenance. A few short examples of implications of the marketing mix shows the key element's variety in application:

Product: Product decisions at the time of launch are related to the branding policy and the breadth of product versions introduced.

Price: The price of a new product at the time of launch is an integral element in its appeal. Pricing reflects competitive positioning and may be an indicator of product quality, innovativeness, and benefits. An obvious practical problem is that other variables usually affect demand both independently and interactively with price. The most significant are corporate objectives, the nature and structure of competition, the software product life cycle, or cost structures.

Distribution: Distribution channels must provide maximum availability and fit the target market's buying behaviour. Software product developers may have to invest more in distribution to train distributors in order to encourage product diffusion throughout the market.

Promotion: Research suggests that that attention to the promotion effort separates good software products from poorer ones.⁴²

Once defined the elements for strategy and product marketing plans, they are essential for the product launch, and are as well essential for the maintenance of products in the market by modifying the different contributions for every element.

⁴² See [Cooper / Kleinschmidt 1995], p. 334.

3.1.2. BUSINESS MARKETING INTELLIGENCE

A basic step of all product related management activities is the knowledge of what is going on in the market. The requirement of creative and effective marketing strategies is good and entire information about the customers, the competition, and the micro- and macroenvironment of the company. This subchapter will present a general overview of product manager's marketing research activities to have insight in which field and market he or she is operating.

Marketing intelligence is a systematic process for generating the information needed to effectively manage business marketing strategy, that are based on information about market potential, customer requirements, industry and market trends, present and future competitive behaviour, expected sales, market-segment size and requirements, and sales and profit performance for customers, products, and territories.

Product management is in use of marketing experience, knowledge, techniques and skills to improve the productivity of the sales process,⁴³ the assessment of opportunities, and the elaboration in planning for products. Effective and efficient use of heterogeneous data has become crucial, especially in high-competitive markets.⁴⁴ To meet the demands the key marketing principles request, it is necessary for a company elaborating in-depth research work. Collection, analysis, synthesis, interpretation, and dissemination belong to intelligence activities.⁴⁵ A marketing intelligence system provides managers with information that is timely, reliable, and carefully interpreted,⁴⁶ and aid the planning of all business functions.

Market research is the "systematic and objective approach to gathering marketing information which, when processed, analysed and interpreted will help to identify problems and opportunities that allow for better-informed, lower risk-decisions",⁴⁷ and a key success factor for any business developing new products. The market environment is constantly evolving and changing in many different ways. Without knowledge of these changes it is impossible to develop a successful business-/product strategy. Quality market intelligence provide managers with the raw data that is required to make quality decisions. Without information from market research business

⁴³ See [Handscombe 1989], p. 93.

⁴⁴ See [Fayad et al. 1999], p. 7.

⁴⁵ See [Mahin 1991], p. 214.

⁴⁶ See [Fries 1982], p. 47.

⁴⁷ See [<http://www.ama.org>]

tends to fail, i.e. that decision makers can commit expensive mistakes that can lead to the loss of market share or the competitive advantage.

The market research comprises several studies like competitive benchmarking, new market studies, trend analysis, product market studies, corporate image studies and evaluation, or brand image studies. These studies help product management to resolve many market-related problems, used to develop business, marketing, and product plans. Product management uses the research findings and databases that are provided by its own research or by the intelligence department. This ensures that the firm is developing and improving products that effectively meet customers and marketing the products in ways that achieve a positive response from target customers.⁴⁸ The databases are used to estimate market potential and to forecast sales. These estimation procedures are crucial for every current and future product.

Competitive analysis should be a central element of the marketing planning process. It is seen as a core application of marketing research techniques especially in the business-to-business environment to collect accurate and reliable information about competitors.⁴⁹ In this way, areas of competitive strength and weakness can be identified, and the results fed into the process of developing an effective marketing strategy. Better and more precise attacks can then be aimed at competitors and more effective defences erected to fight-off competitors' moves.

An additional benefit of competitor's analysis is that it can help in the process of understanding buyer behaviour by identifying each competitor's strategy. In turn it can be used as the basis for determining the most effective probable positioning strategy for the company. Moreover, competitive benchmarking is helpful to get insight in practices competitors perform that are better than the own practices. Benchmarking is one of the most effective forms of competitive intelligence, because of the "goal of redesigning a competitive edge" into own products.⁵⁰

⁴⁸ See [Hutt / Speh 1998], p. 158.

⁴⁹ See [Ibid. 1998], p. 160.

⁵⁰ See [Dumaine 1988], pp. 68 - 76.

3.1.3. Opportunity Identification and Strategy

To gather new product ideas from customers, intermediaries, sales personnel, engineers, competitors and management is a crucial part of product management in relation of market research in a systematic process. Opportunity search is significant to customer-related opportunities in "today's and tomorrow's marketplace for current and potential products and product technology."⁵¹ For the purpose of this paper a technological opportunity is defined as a business opportunity anchored around a technology-based product innovation. The opportunity is a chance to profit from advancements in a particular technology through commercialisation of products which satisfy a certain customer need. The range of product market opportunities to be considered by product managers is extensive. New product ideas and improvements for mature products are drawn from a multitude of sources. Besides market, product, and technological opportunities, the identification of opportunities can also be derived from social, political, or partnership surroundings.

It is widely acknowledged that a constant supply of new products and their successful commercialisation are a key to a firm's survival in today's competitive environment.⁵² Therefore, product managers constantly need to assess the worthiness of the identified ideas (or technological opportunities). This subchapter focuses on five factors considered to be important for the assessment and identification of the worthiness of a technological opportunity. These factors are:

- **Strategic alignment**
- **User needs**
- **Value network**
- **Risks and Rewards**
- **Product Positioning**

Strategic alignment addresses the question of how project contributes to the business unit's strategic objectives. Several studies on the successful commercialisation of products based on technological innovations deal with strategic alignment.⁵³

User needs are important since the commercialisation of products based on innovations only succeeds if the products satisfy a specific user need. Clark⁵⁴ emphasizes the

⁵¹ [Handsombe 1989], p. 29.

⁵² See [Rangan/Bartus 1994]

⁵³ See for example [Barton/Wilson/Doyle 1993]

⁵⁴ See [Clark 1985], p. 236.

importance of learning in the dynamic interaction between producers and users, where users learn about what they want or need, and producers learn to introduce products to satisfy the users' needs.

The *value network* is the context within which a firm competes and solves the customers' problems. The players in the value network consist of the firm, customers, suppliers, complementors and competitors.⁵⁵ Complementors are players from whom customers buy complementary products or to whom suppliers sell complementary resources.

Financial *risks and rewards* are critical to any project. Companies make capital investments. For a corporate manager to proceed with an investment in a new project, cash flow analysis calculations are not sufficient. In order to carry out the required analysis, a weighted average of cost of capital is needed; the latter depends on the risk characteristics of the particular opportunity.

Product positioning, that is determining the potential market niche for the product, who its target customers are and why they would buy the product over the competing products, is considered an important success factor in new product definition and development. To provide higher value to the users⁵⁶ than competitive products an in-depth understanding of users' needs and purchase motivation is required.

Market assessment is an iterative process of understanding what types of capabilities might be delivered at various prices and estimating market size for various product concepts. While many of the technical details may be handled by R&D personnel, it is more common for product management as a marketing function to engage in the activities which help facilitate the development of the market.

⁵⁵ See [Brandenburger / Nalebuff 1995], p. 67.

⁵⁶ See branding aspects in the next chapter 3.1.4

3.1.4. BRANDING ASPECTS

Many technology-oriented managers think of branding and product management only as an advertising campaign or a slogan. A brand is "a name, term, symbol, or any other feature that identifies one seller's good or service as distinct from those of other sellers."⁵⁷ The image of a product or service is closely linked with the issue of branding. Brands allow customers to identify products and services which will promise specific benefits, such as performance, price, and quality. Branding provides a point of differentiation from competitor's products and are a way of adding value to the product. They are extremely valuable because they provide access to markets.⁵⁸ "That may be more true for high-tech products than it is for soap."⁵⁹

Brand identity includes brand names, logos, positioning, brand associations, and brand personality. The brand name gives a first impression and should evoke positive associations with the brand. A positioning statement tells what business the company is in, what benefits it provides, and why it is better than the competition. Brand associations are the attributes that customers think of when they see or hear the brand name or logo, and the brand personality adds emotion, culture and myth to the brand identity.

The customer is present in the branding process because the customer is present in the mind of company management so that management's vision of the brand's values should incorporate all they know and feel about the customer. Figure 5 describes the function of branding how it is perceived by buyers on the one hand and the seller on the other hand. To highlight are the quality assurance for the buyer acquiring products from a well-known and branded company and the premium pricing by the seller.

Most technically trained managers underestimate brand images, because of serving markets where highly sophisticated and experienced customers act, and their purchase decisions have nothing to do with emotional or irrational decisions.⁶⁰ Through strong brands, high-technology companies can make it clear exactly which aspects of their offering's price and performance benefit their customers. Additionally, the people involved in purchase decisions may weigh various performance factors differently.

⁵⁷ [<http://www.pdma.org/glossary.htm>]

⁵⁸ See [Phillips 1995], p. 85.

⁵⁹ [Ward/Light/Goldstine 1999], p. 302.

⁶⁰ See [Ward/Light/Goldstine 1999], p. 86.

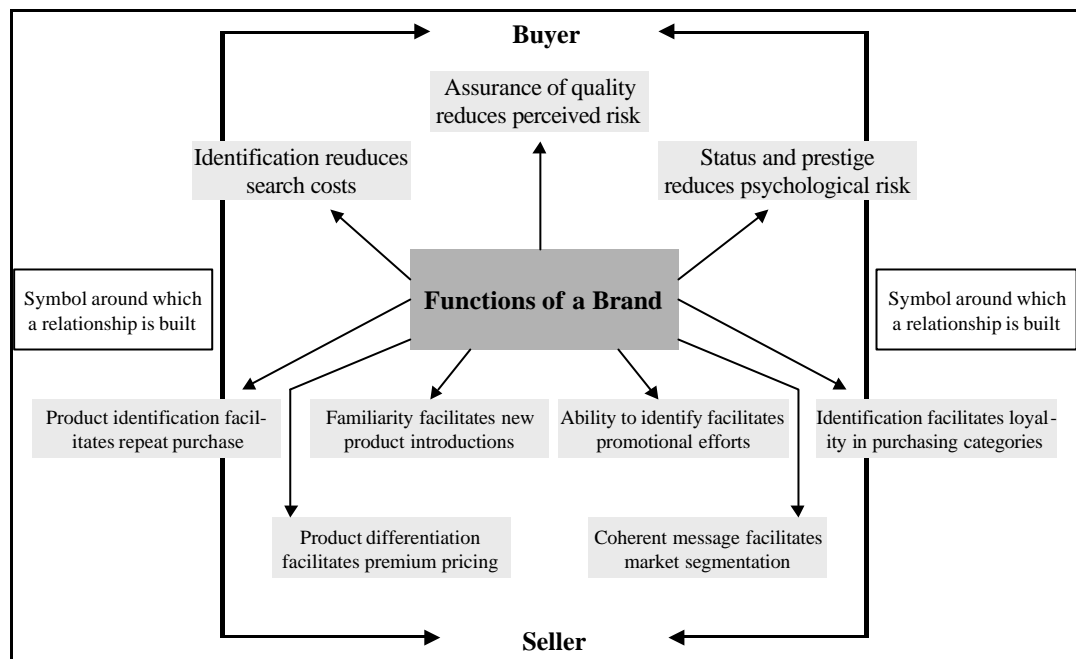


Figure 5: Functions of a brand for the buyer and seller

Source: [Berthon/Hulbert/Pitt 1999], p. 54.

In high-technology markets, which are often highly segmented, offering a distinctive value proposition is especially difficult. Light⁶¹ suggests a brand pyramid how "High-Tech Brands Build Equity". This pyramid consists of five levels describing a process where the (product) manager needs to answer the following questions to pursue a successful branding strategy:

- Level 1: What are tangible, verifiable, objective, measurable characteristics of products, services, or components that carry this brand name?
- Level 2: What benefits to the customer or solutions result from the brands' features?
- Level 3: What psychological rewards or emotional benefits do customers receive by using this brands' products? How does the customer feel?
- Level 4: What does "value" mean for the typical loyal customer?
- Level 5: What is the essential nature and character of the brand?

If there is no explicitly appointed brand manager within the company for the defined product or service, product management should use the tools of branding to create powerful brands for their products or services.

⁶¹ See [Ibid. 1999], p. 91.

The presented pyramid levels help product management to accomplish the branding objectives of creating a more powerful brand. Moreover, it may be also less costly for powerful brands to launch new products, because of their loyal customer base and the increased willingness of potential customers to deal with a well-known brand.

3.2 SOFTWARE DEVELOPMENT PROJECTS

Product development is a high-priority activity within the corporation's goals. It is one of the "riskiest, yet most endeavours of the modern corporation."⁶² The development of new software products is a strategic opportunity to generate competitive advantage and profits in a global marketplace. Innovative high-tech product development is considered to include a broad set of activities. The process for moving a new product project from idea to launch is commonly referred to as New Product Development (NPD). It is the "overall process of strategy, organization, concept generation, product and marketing plan creation and evaluation, and commercialisation of a new product."⁶³ Business success is clearly linked with product development success.

3.2.1. NEW PRODUCT DEVELOPMENT MANAGEMENT FACTORS

New Product Development is normally a team-based project. Harmonious interactions between marketing, R&D, and manufacturing departments are essential for improving new product success rates, and that early involvement of all participants contribute to better interaction.⁶⁴ Multi-disciplinary teams are the preferred structure for organizing the NPD process in most firms. In these multi-disciplinary, respectively cross- or multi-functional development teams, a number of critical roles, not just technical skills, must be practiced by the people involved.

These teams are therefore in need of somebody who champions the product and leads the whole process from idea generation to the launch of the product. Activities must be given resources, coordinated, and supervised.

⁶² [Cooper 1992]

⁶³ [see <http://www.pdma.org/glossary.htm>]

⁶⁴ See [Calantone et al. 1995], p. 243.

The roles in detail are:⁶⁵

Idea generators: The creative contributors of new insights that both initiate projects and contribute to problem solutions throughout technical projects.

Product champion (or entrepreneur): A member of an organization who creates, defines or adopts an idea for a new technological innovation and who is willing his or her position and prestige to make possible the innovation's successful implementation.

Executive champion: An executive in a technological firm who has direct or indirect influence over the resource allocation process and who uses this power to channel resources to a new technological innovation, thereby absorbing most, but usually not all, the risk of the project.

Project leader (or program manager): Also referring to as the business innovator, supplies the support functions of planning, scheduling, monitoring and control, technical supervision and business and financial coordination relating to R&D.

Gatekeepers: These human bridges or communicators who frequently bring information messages from sources outside of a project group, linking technical, market and manufacturing sources of information to the potential technical users of that information.

Sponsor or coach: This senior person provides encouragement, psychic support, facilitation to the more junior people involved in the task implementation, often including important help in "boot-legging" the resources needed by those trying to move technological advances forward in an organization.

The roles arise in different stages of the NPD process steps. Some roles, e.g. idea generating, frequently need to be filled by more than one person in a project team in order for the project to be successful. Some individuals fill more than one of these critical roles.⁶⁶

According to the definition it is regarded as one of the main responsibilities that the product manager takes a product from a concept to the market through the development process. The product manager acts as an "inter-departmental coordinator"

⁶⁵ See [Roberts 1987].

⁶⁶ See [Ibid. 1987].

with the involved business functions.⁶⁷ The process is directed, maintained and controlled either directly on a personal basis by the product manager, or indirectly via a product develop manager or a project manager appointed to manage a specific product development program. The product manager has to ensure that the project planning and control process is established, and that the NPD program runs to plan. Within the process there are a number of tasks for the product manager:⁶⁸

- Clear definition of the NPD priorities and relative priorities for improvements in existing products.
- Elaboration of a full statement of objectives as early as possible before significant resources are allocated.
- Development of a master milestone chart incorporating the significant contributions of the various cross-functional parties involved, and ensuring their commitment.
- To monitor progress, often times through a product steering group with e.g. full-time project manager and a part-time product manager.
- To work out a product risk analysis to anticipate problems.

The individual product manager assumes a central role in sensing an opportunity and in mobilizing an informal network to explore the technical feasibility and market potential of the first step: the idea; and is willing to assume significant risk to make possible the successful implementation of the idea.⁶⁹ He or she is the leader who inspires and guides a team toward a common goal and is highly accountable for the achieved results. The leader is the principal player within the team, the human "glue"⁷⁰ that holds the team together. Leadership to the defined roles means in this context that the product manager is the entrepreneurial product champion who acts for the product or product line as the CEO for the whole company.

⁶⁷ See [Katzenbach/Smith 1991], p. 293.

⁶⁸ See [Handscombe 1989], p. 76.

⁶⁹ See [Howell 1990], p. 317.

⁷⁰ See [Whitten 1995], p. 60.

3.2.2. THEORETICAL APPROACHES TO NEW PRODUCT DEVELOPMENT

According to a benchmarking study by Cooper (1996), the three cornerstones of successful product development are process, strategy, and resources. Some of the most pragmatic and operationally useful research on the NPD process has been carried out by Booz, Allen and Hamilton. Success, they suggest, is most likely to occur when organizations adopt a conscious step-by-step approach that begins with the search for possible new product ideas. Organizations have to build an infrastructure that is chartered to listen to, respond to, and anticipate the market. Among others, sales, marketing, applications, customer services or engineering are expected to participate in the creation of market and product concerning ideas and proposals. After the idea creation the process moves through a series of evaluative stages culminating in the launch of the new product. The step-by-step approach consists of eight stages. These are illustrated below, which begins with the statement of the new product development strategy.

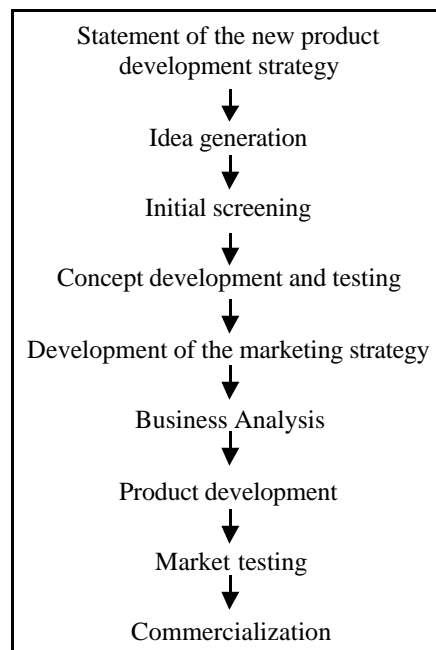


Figure 6: The NPD process

Source: Adapted from Booz, Allen and Hamilton

This step-by-step approach is basis of several NPD process models elaborated by other authors and companies and delivers product management the basic guideline in the discipline of project management for NPD. A more sophisticated approach to NPD suggests Cooper with the stage-gate (or phase-gate) process where each stage of the

NPD is followed by a "move-forward/Go-back/Kill/Recycle"⁷¹ decision node called a gate. As illustrated in figure 6, generally the process can be captured in five phases: idea validation (preliminary investigation), conceptual design (or feasibility), development (specification and design), launch (first release and market testing); and maturity (manufacturing ramp-up). It should be noted that there is a pre-phase 0 stage where idea generation and initial screening occur prior to enter the NPD process. Each phase is followed by a gate review meeting attended by all the stakeholders (i.e. senior management, development leader, marketing manager, manufacturing director, and naturally the product manager) who review according to the defined roles the deliverables and collectively decide to move forward with the project or to stop it. Typically there are four formal gates:⁷² Screen and launch the project (gate 0), approve project implementation (1), release the design(2), begin volume manufacturing(4).⁷³

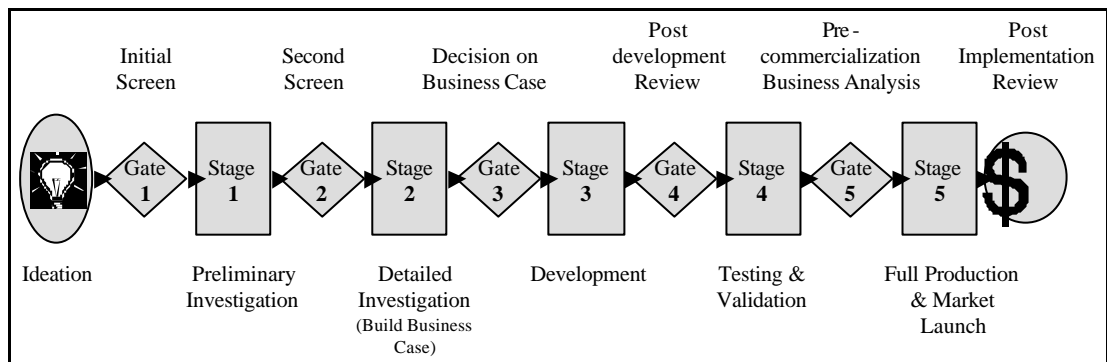


Figure 7: Typical stage-gate NPD process

Source: Adapted from <http://www.stage-gate.dk>

"The stage-gate process system breaks the new product project into discrete and identifiable stages, typically five. Each stage is designed to gather information needed to progress the project to the next grade or decision point. Furthermore, each stage consists of a set of parallel activities undertaken by people from different functional areas within the firm."⁷⁴ The stage-gate process has several advantages:⁷⁵ it achieves discipline and consistency, identifies and reduces risk, resolves development problems, allows for parallel processing in a multi-functional process and empowers the team.

⁷¹ See [<http://www.stage-gate.dk>]

⁷² See [Cooper 1996], p. 478.

⁷³ The two missing gates are marginal.

⁷⁴ [Cooper 1992]

⁷⁵ See [Rosenthal 1992], p. 42.

By establishing processes and practices the stage-gate process provides an easy to understand, flexible method to be followed in the cross-functional team structure for NPD. Many companies have recognized the benefits of developing new products through a stage-gate process. Companies using the stage-gate process for NPD are able to stop a project sooner, rather than later, "saving valuable resources for more viable projects."⁷⁶ These companies use cross-functional teams, encourage the use of process, and communicate at all levels. They are regarded to have set benchmarks by some authors like above mentioned Barone from Lucent Technologies, and is an often cited NPD process of the Product Development and Management Association⁷⁷

However, every model is in use of modifications if it will be implemented to a certain branch or company. The next subchapter tries to define a software development process using an incremental model based on the suggestions of Whitten (1995).

3.2.3 DEFINING A SOFTWARE DEVELOPMENT PROCESS

In rapidly evolving industries like the software business, flexible product development is important to avoid that a rigid, sequential development approach can risk an obsolete product.⁷⁸ Without a disciplined and defined development process, software development organizations usually face a significantly increased risk in predicting and controlling the critical factors of cost, schedule, quality, and function.⁷⁹ A well-defined software development process serves as a roadmap to help ensure that a predictable output will be achieved. It should be made up of a comprehensive set of activities which the members of a new project can select a subset that will best serve the right needs of that project. The process has to allow the development team to suggest changes to improve its usefulness and has to be tailorable to meet the demands of the unique software coding organization. Whitten⁸⁰ promotes eight steps to define a software development project. It comprises:

- Identify the software model.
- Identify the activities.
- Identify the relationships among activities.

⁷⁶ ([Barone 2000] in <http://www.pdma.org/visions>)

⁷⁷ [<http://www.pdma.org>]

⁷⁸ See [Inasiti / MacCormack 1997], p. 113.

⁷⁹ See [Whitten 1995] p. 11.

⁸⁰ See [Ibid. 1995], p. 18.

- Document other useful information on each activity.
- Document how to tailor the process.
- Document how to improve the process.
- Obtain buy-in of the process.
- Continually use and improve the process.

The first step is to decide which best development process the organization should apply. There are numerous models and processes yet defined, often based on the models described in chapter 3.2.2. The incremental model⁸¹ responds to the special demands of software coding by developing the product incrementally, i.e. in pieces. The figure 8 describes the several steps of requirement statement, definition, and design according to a master milestone plan. After these phases each piece is low-level designed, coded and tested, and comes to the system test where it is further integrated and tested as a whole. The advantage of this model is low time-consumption, because of the overlapping manufacturing.

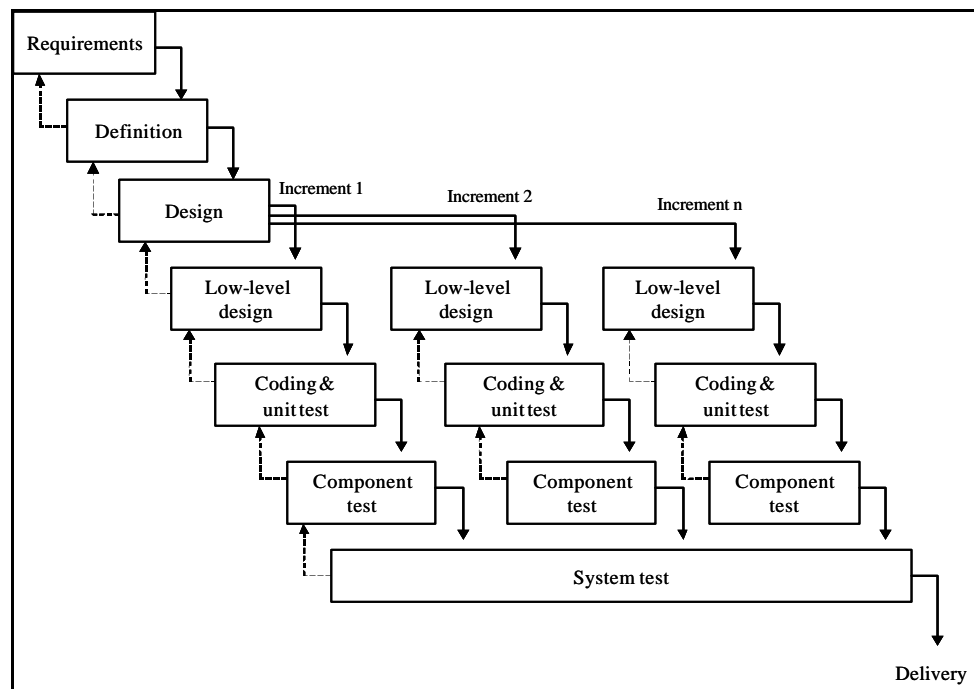


Figure 8: Incremental model for the software development process

Source: [Whitten 1995], p. 21.

⁸¹ See [Whitten 1995], p. 21.

Referring to product complexity or project size every company is free to apply this or similar models for a special project, but it is accepted as very helpful for project members using a model that they understand and have experienced and have improved.

After the selection of the best development model, the next step is to identify the primary activities of any unique new project. These activities are requirements, objectives or specifications of the product to build. The primary activities are documented in the first product and marketing plans the product manager is normally writing. Step 2 and step 3 (Identify the Relationships Among Activities) are nearly equal, but it is important to identify which activity has to perform before the other. Each activity depends naturally on other useful information documented in the next step.

Having done steps 1 - 4 the company is able to document how to tailor the process, i.e. the exact knowing which parts of the model are necessary to perform the new project and which parts are not necessary. Now that the software development process is defined and rules on tailoring the process are documented, the company is in need of a documentation how the process can be continually improved. A process team is formed in which every team member take over the responsibility for one major subject. The documentation controls process improvements by defining change requests, deviation requests and "post-project review" change requests. Step 7 is to ensure that every member of the organization, including all levels of management, commit to use the process, and train the personnel on the use of the process. Once the software development process is approved and used, the notion of improvement is still on-going, because no process is perfect in its original design.

An example and overview of a software development is presented in figure 9 where the different activities are listed in dependency of the chronology, and the time that every activity requires.

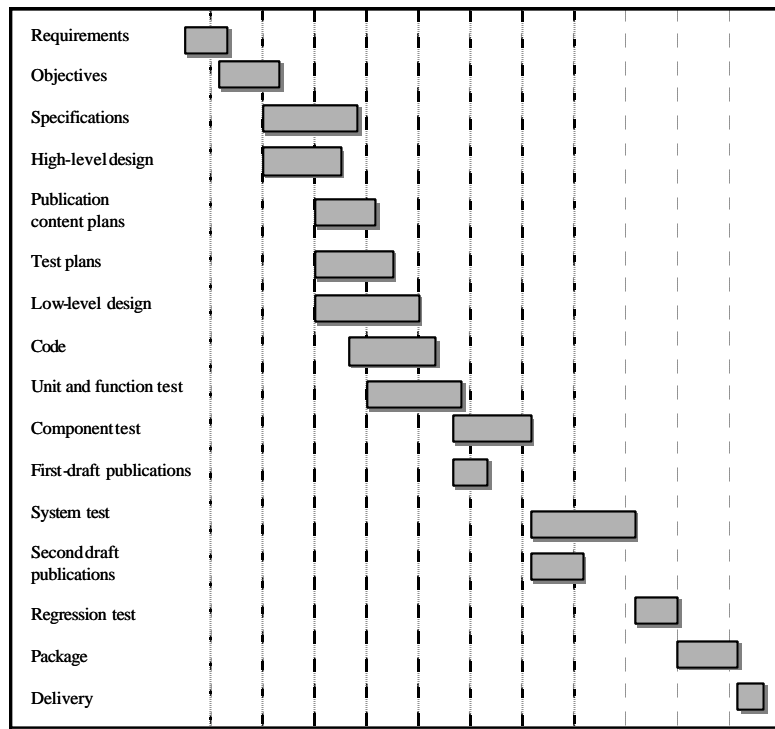


Figure 9: Overview of a software development process

Source: [Whitten 1995], p. 35.

The presented software development process shows that there are slight variations to the first model. It also shows the number of activities to perform. It must be sure that these activities are getting in control. Projects are usually only successful when they are delivered on time. Therefore is the most important plan of a project the project schedule plan. The project scheduling activity can make the difference between profit and loss. A well-defined schedule plan support project members to follow a time-frame in order to achieve their greatest productivity. Milestones have to be identified and communicated. Major reasons for identifying milestones is to avoid losing sight of the big objective, and to report status of the project to higher management. To pursue the milestones it is as well easier within the project schedule plan to allocate the several activities to the responsible people and give every team member a customized project checklist. In status meetings the project checklists are appropriate tools for the supervision of the progress of the project. Schedule plans can be derived from the illustrated figure 9.

3.2.4. MANAGING CONFLICT IN SOFTWARE DEVELOPMENT TEAMS

The marketing - R&D interface has been a persistent and frequently studied problem in NPD. Several studies have shown the adequate integration of these two activities is hard to achieve.⁸² Practitioners from R&D and engineering think that marketing fails to understand the technical trade-offs involved in product management decisions. Conversely, marketing professionals sometimes complain that their technology-oriented colleagues pursue product development initiatives without adequate market awareness. Marketing managers, for example, see features and platform diversity to be the essence of the competitive edge. They are more willing to trade off the time it takes to do comprehensive testing in order to include additional features. They believe that success is tied to market factors such as features, price and company reputation. They expect bug fixes to come out in "dot" releases or to be replaced by functional releases. Engineering managers, on the other hand, although very feature-oriented as a group, are about as likely to decide to drop or postpone features as they are to forego testing, in order to get the product out to the market.

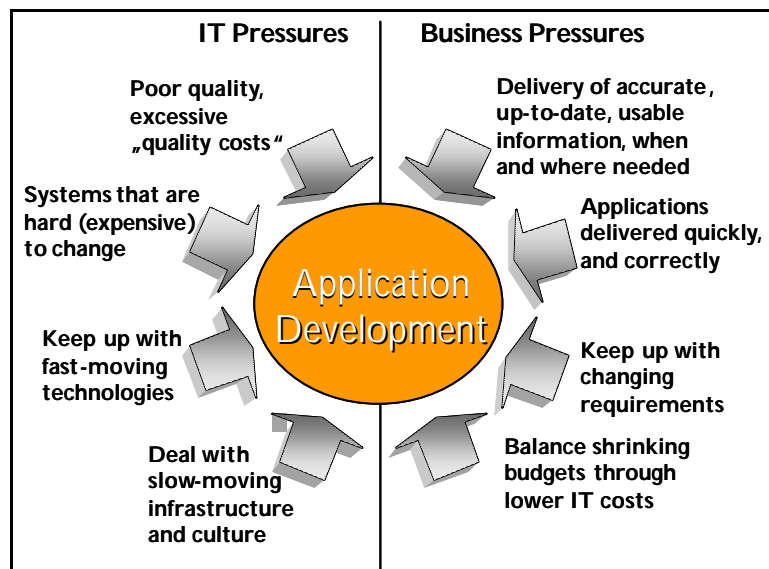


Figure 10: Application Development Pressures

Source: [Stone 1997], p. 7

Generally it is observed that marketing still has a limited role in product development in many high-tech firms.⁸³ Three factors contribute to marketing's marginal role:⁸⁴

⁸² See for example [Souder 1988], pp. 6 – 19.

⁸³ See [Workman 1997], p. 257.

⁸⁴ See [Ibid. 1997], p. 260.

(1) the need for technical expertise to understand business opportunities, (2) the development of technology-oriented organizational structures, and (3) the way in which marketing is defined in many high-tech companies. But also a general finding is that projects where marketing and engineering work together typically have higher success rates than those where they don't. Moreover, while such emphasis on technical skills early in the life cycle of a new firm make sense, there may be a need for a transition to more of a commercial or business perspective as products enter the market. NPD's increasingly important visible and important role in business, and pressures to deliver products that are on time and correct, application development is also subject to IT pressures to produce solutions that can be cheaply changed, and to lower software quality costs. We see that there are several potential conflicting areas.⁸⁵

Software development is characterized by conflict that consequently must be managed to achieve strategic project success. Conflict relevant to organizations can be defined as "[...] the process which begins when one party perceives that the other has frustrated, or is about to frustrate, [...]"⁸⁶ Functional conflict between the two main stakeholders marketing and R& D in NPD has positive as well as negative consequences depending on the context driving the conflict. A study⁸⁷ investigating the problems of designing large software systems for example, indicates that the development of large software systems is mainly a learning, communication, and negotiation process, and that collaborative problem solving is more likely to occur in small, rather than in large, teams. Positive consequences and successful development is therefore possible when the small team conflict shows a "give and take" confrontation. Managing conflict well will increase the chances of success; not managing conflict will worsen the conflict, decreasing the chances of success. Unresolved conflict has a strong, negative effect on overall software product success and customer satisfaction.

Management must ensure that conflict remains on a healthy level. If expected and required, the product manager is the interface in the project choosing an appropriate conflict management style. The literature on conflict management provides some guidelines, but it should be approached with caution. Gobeli et al.⁸⁸ suggest that two conflict management styles have beneficial effects on success at the organization level for software companies. These styles are confronting and give and take. The study

⁸⁵ See [Stone 1997], p. 6.

⁸⁶ [Thomas 1976], p. 891.

⁸⁷ See [Curtis et al. 1988], pp. 1268 – 1287.

⁸⁸ See [Gobeli et al. 1998], p. 433.

indicates that the project level management (product management) should emphasize confrontation over give and take when conflict surfaces. Emphasizing confrontation appears crucial at the project level, even if give and take can be better tolerated at the organization level.

3.2.5. LAUNCH AND COMMERCIALISATION PROCESS

Final step of the new software product development process is the launch of the product. There is often, but not always, a shift in responsibility in product management. This work makes the hypotheses that product management leads the product from birth to death, that includes firmly the launch stage of the product life cycle.

The commercialisation or launch stage of the new product development process is very critical and an important product management activity. It will lead to failure rather than to success to apply normative recommendations about how to launch products of each type in evolving business environments. Even for well-managed new product development processes, there is still an expected failure rate of 30% for new products at launch.⁸⁹ Launching a new product is a costly business, but one that has not been systematically investigated.⁹⁰ Literature has categorized launch decisions into two categories: strategic and tactical launch decisions.⁹¹ Strategic launch decisions include the nature of the new product (product strategy), the nature of the market into which the new product will be launched (market strategy), the competitive position of the product, and the firm's overall orientation towards NPD efforts. One strategy in software firms is to group various features in different releases of the software, with marketing input often being used to decide which features are more important and must be included in the next release and which can wait. A product marketing plan that comprises these strategies must be finalized prior to launch and revised in process. Elements of this plan include a situation analysis, marketing strategies and objectives, the financial summary, tactical plans, control plans, and support requirements.⁹² These strategies are prior to tactical launch decisions which include the classical elements of the marketing mix:⁹³ the level of marketing investments, the breadth of product

⁸⁹ See [Urban / Hauser 1980]

⁹⁰ See [Calantone / Montoya 1993], p. 240.

⁹¹ See [Hultink et al. 1997], pp. 243 – 257.

⁹² See [Calantone / Montoya 1993], p. 245.

⁹³ See chapter 3.1.1.

versions launched, how and where to distribute and promote the new product, and its price.

Fundamental to strategy success seems the knowing of five customer classes of technology adoption in high-tech markets. These five classes model bases on a tool developed by Moore⁹⁴ for marketing strategies. He differentiated potential customers into technology enthusiasts (innovators), visionaries (early adopters), pragmatists (early majority), conservatives (late majority), and skeptics (laggards).

The management and control of the launch and commercialisation process and the elaboration of the strategies are obliged to the product management function. Besides the above mentioned parameters, coordinated timing and carefully planning in communication are the cornerstones of a successful launch. Product management has the vital task of masterminding the planning and implementation of a product launch programme that is timely, has impact and gives the product a chance of survival in the market.

The initial and most actual launch plan defines:⁹⁵

- The target priority potential customers, distribution channels, and people to commit.
- The target audience for a launch event, including end users and customers, and influencers like press and well-known people of the business environment.
- The selected launch date with considerations about the exact timing.
- The style, location and scale of launch which have to fit with corporate style and lifestyle of the planned audience.
- A budget for the expenditure to be incurred.
- A risk analysis simulating a thorough evaluation of the competitive downside risks and an objective response.

Also internal addressees, which all have impact on the success of the product, must be involved in this launch programme. The sales force for instance has to be convinced that this product is worth its effort and time. They must receive a technical training to know what they have to sell. Distribution channels have to be defined, and advertising decisions must be planned together with the other aspects and implemented in a

⁹⁴ See [Moore 1995], pp. 14 – 18.

⁹⁵ See [Handscombe 1989], p. 85.

complementary way with the responsible people inside and outside the company. This coordination requires high levels of cross-functional communication and cooperation. Although launch and commercialisation are the final step in NPD process, it has to be clear that the elements of this level has its roots in many of the earlier steps.

In the software environment, there is often only a small window of opportunity for producers to reach their markets. Software for business markets and high-tech markets are characterized as risky, fast-moving, expensive, and entrepreneurial.⁹⁶ The launch of a product brings the producer face-to-face with the customer. Typically the producer has no second chance to reposition the product, and no second chance to convince the customer. Attention must be given to precisely what information should be released to the market before launch so that sufficient interest in the new product can be aroused without losing a competitive edge in a market where imitation can appear simultaneously. The target markets need to be clearly defined and the positioning strategies are several. Potential benefits and applications of the software are typically so wide-ranging that product positioning is - based upon tangible (i.e., technological) or intangible (e.g., image) - essential. Once defined which target market the software product has, there are several tactics to attack the market. The objectives of the market attack tactics depend on the state of technology, and the awareness the market has of that technology.

The use of these different launch tactics depend on the degree of technological and market maturity, i.e. whether the product is launched into an established market or a new market. Figure 11 shows a matrix describing several tactics the product manager can follow by launching the product.

The launch tactics matrix is based on an investigation⁹⁷ that has been made on the kinds of tactics marketers (product management) use to launch their products. The tactics developed in the study derive directly from industry practice with a few generalizations that can be made.

⁹⁶ See [Beard / Easingwood 1996], p. 88.

⁹⁷ See [Ibid. 1996], pp. 87 – 103.

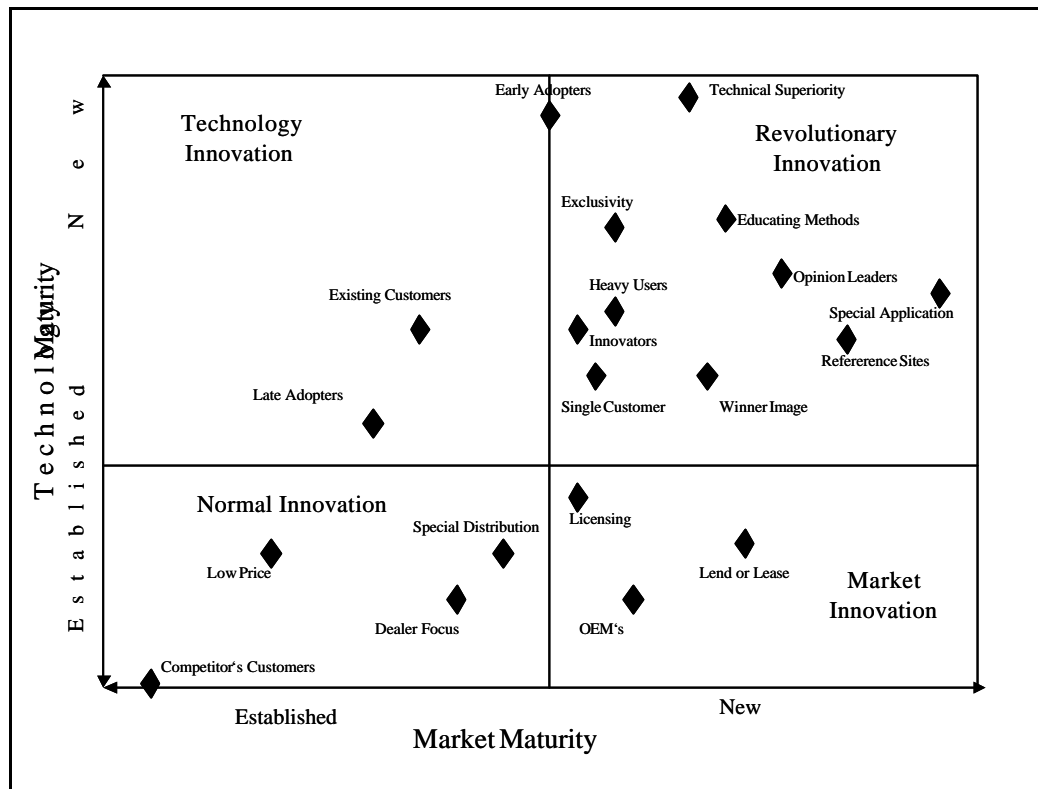


Figure 11: Market and technological maturity and the use of launch tactics
 Source: Adapted from [[Beard / Easingwood 1996], p. 101.

Launching new products into new markets concentrates on positioning the products on the basis of technology and application-specific attributes. In new markets instead there is little significance attached to market preparation and targeting tactics. The tactics associated with revolutionary innovation are highly focused on the new technology.

We see that product management has to be fully aware of different tactics in positioning the product, and follow-on. It has to find the right price of the product, spends the right amount on advertising, or finds the exact organizational aspects of launching a product. It shows strongly which impact the function's work contributes to the success of the product to manage.

3.3. HOW PRODUCT MANAGEMENT IS DEFINED IN SOFTWARE BUSINESSES

Due to the "booming" nature of software product development companies and the relatively "New Economy" in general, it is hardly possible to speak about best practices and blueprints concerning organizational set-up or strategies and tactics. Just as little it seems advisable that the application of success stories like mySAP.com or Microsoft promises a similar success to any other company. However it is even indispensable to benchmark comparable firms. Software product companies typically face the following challenges:⁹⁸

- How to build a new software product while managing the existing products?
- How to manage the cost and delivery in the given window of opportunity?
- How to manage the ramp-up and scale-down of efforts and specific skill requirements that characterize a software product's life cycle?
- How to feel confident to incorporate new technologies?

3.3.1. MARKETING'S LIMITED ROLE IN MANY SOFTWARE FIRMS

It is common for the founders of high-tech start-ups to have technical backgrounds and for marketing and sales to have a secondary status in the early development stages of the firm. And even top managers in established high-tech companies feel a strong identification with their typically engineering profession, although they have to use business administration tools to give the infrastructure to sell products.

We have seen in the previous chapters that product management usually is defined as a marketing function, having technical expertise, but as well the overall business overview concerning the commercial success for the managed products and services. As stated in chapter 3.2.4. marketing has often a limited role in many high-tech respectively software developing companies, because of the missing technical understanding and the traditional technology-oriented organization chart that has grown over the first years or decades of a firm's life. Workman⁹⁹ found out that in many high-tech software firms the product management function is not part of marketing but rather part of the R&D organization.

⁹⁸ See [<http://www.kpit.com/businessareas/prodmgmt2.htm>]

⁹⁹ See [Workman 1997], p. 266.

One reason for having product managers in R&D is the short product life cycle of many software products and the fact that a high percentage of the product managers is devoted to working with R&D in development and introduction. A second reason is that many software products are modular systems which are then adapted to specific applications and types of customers by marketing and sales groups. In this case, product managers can better help R&D make trade-offs of what aspects should be "hard-wired" and common to all market segments and which aspects should be left to be adapted by sales and marketing groups for specific sectors or specific types of applications. In a third case, program or project managers are used rather than product managers, report to R&D or engineering managers. Customer service and support units are typically part of the sales organization and the primary tasks of marketing in those firms consists primarily of marketing communications. The term 'marcom' (marketing communication) is commonly used in high-tech firms and refers to such communication activities as doing trade shows, developing and placing ads in trade journals, coordinating direct mail and lead generation, developing brochures and literature, training the sales force, and doing press relations activities.

But in general marketing does not have as much power over product development decisions as the people in R&D. It is typically necessary for product managers to have technical expertise in order to understand the potential capabilities of their products and to understand how these technologies can be applied in potential customer businesses. Potential customers in the B2B environment typically have a high level of technical knowledge and want to interact with technical personnel on the seller side.¹⁰⁰ Technical expertise is also needed in order to interpret information from the marketplace and to understand the factors affecting the development of the technology, or where new products are interconnected with other products (which is common of software products).

Roberts (1992) have found that more successful firms tend to have a change in emphasis from R&D to marketing as products enter to market or as firms expand beyond their original niche in the market. While these transitions may be necessary, in some cases it can take a very long time to change the technical culture. What marketing and therefore product management as a marketing function should contribute to the important development of products are (1) market assessment and development (2) interpretation of market feedback, (3) adaptations of the products and explanation of

benefits for specific market segments, and (4) often times the overall project management of the NPD respectively the active leadership of the product.

3.3.2. ORGANIZATIONAL APPROACHES TO SOFTWARE PRODUCT MANAGEMENT

As mentioned in chapter 2 the function of product management can be implemented in several different ways depending on an organization's needs, size and growth of stage. There are many factors that must be right to permit software product management to function with full effectiveness. One of the decisive factors influencing the effective work has to do with organizational structure and team structure especially in in the development of new software products, i.e. cross-functional vs. functional teams, politics, culture and reporting hierarchies. Another factor is, that a product usually is a part of larger strategic units. Management of, and organization for products depends on the strategic requirements of the individual products as well as of the larger strategic units. No matter where the product management function is assigned, in its variety of forms it has significant impact on the good quality products, source of sales, margins and profits, and the establishment of a customer orientation throughout the company.

If a company is experiencing actual growth, it may have reached a size where the senior management must be focused on larger institutional matters such as creating an infrastructure and company business plan to allow for further growth. By appointing a responsible person on each major product or product category, an important part of the management responsibility on that line is transferred to the product line level. This is one reason, an another reason is lacking interface management within a company. While start-up firms may have a handful of people that simultaneously handle product development, marketing, manufacturing, and sales, as firms grow they typically expand into a range of environments and allocate these tasks to groups or people that are more specialized. With this tasks across groups, comes the need for leadership, "integration", and communication between the groups. Product management is normally defined to take over the role of the integrator, besides the extremely important responsibility for

¹⁰⁰ See [Workman 1997], p. 261.

its product or product line performance. Typical and representative structures for many companies with a product management organization are presented below.

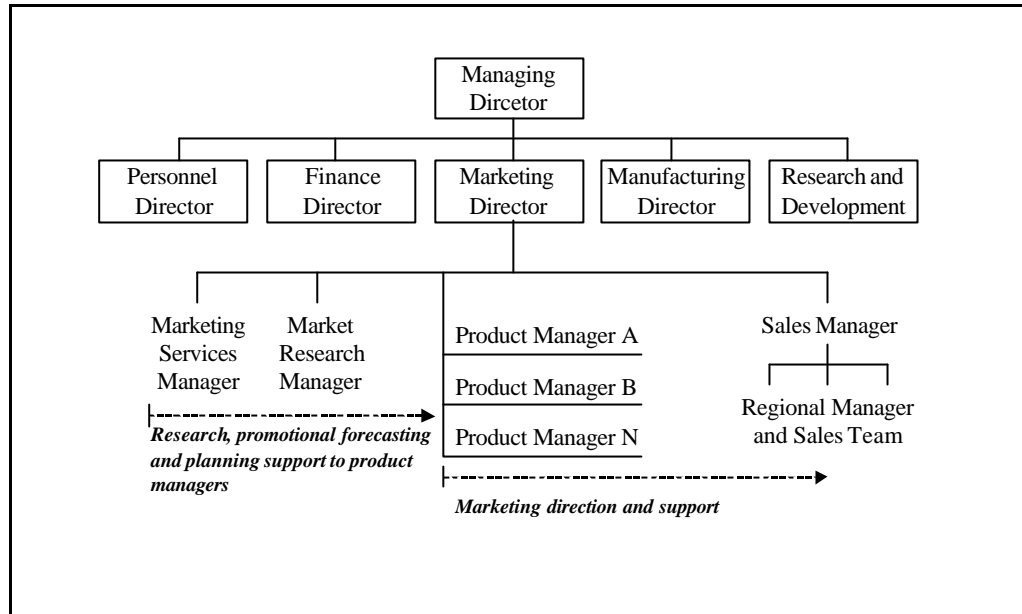


Figure 12: Typical line organization structure for product management
Source: [Handcombe 1989], p. 149.

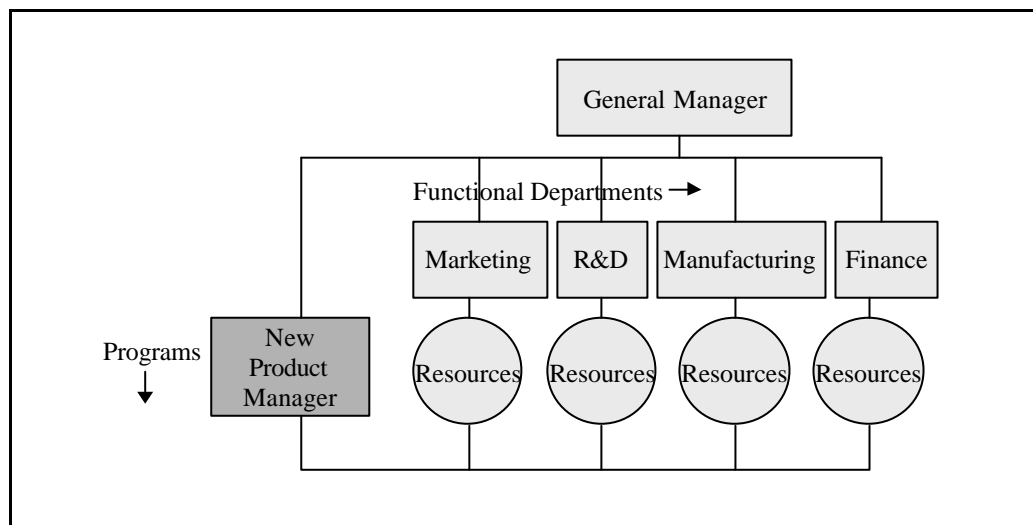


Figure 13: Typical matrix organization structure for product management
Source: [Mahin 1991], p. 295.

Naturally there exist variations in exact reporting relationships in practice, but do not affect the fundamental contribution to company success of the managers illustrated. The structures replace a functional model as the number of product lines increases. It is observed that product managers are introduced to manage products or products lines, as well as to coordinate the employment of corporate resources like technical expertise and working time. Most times product management is found in reporting line to

marketing, because they often have no direct authority over the personnel in other areas whose resources they use to manage their product lines. Hence a matrix organization could result in which multiple reporting relationships and quasi-reporting relationships occur.¹⁰¹

Two key considerations in organizational structure are the extents of formalization (the existence of specific rules and procedures) and centralization (the level in the firm at which decision making is carried out).¹⁰² The literature is mixed in its assessment of the impact of these two elements on the extent of marketing-technical integration. Formalization is generally thought to be an impediment to effective integration, centralization also can work to improve or hinder interaction at the interface. The literature pertaining to organizational issues formed a basis for principles to product management organization:

- Innovative ideas have a greater chance of eventual new product success when there are a fewer participants in the decision system,¹⁰³ fewer opposing factions within the firm,¹⁰⁴ and when decision-making is centralized.
- Key factors that facilitate innovation are the ability to monitor environmental trends, organizational flexibility, and the concentration of power in an organization.
- Once a choice has been made regarding a strategy for resource allocation, firms do best if they concentrate on making those strategies work rather than trying to change the strategy. It is important for a new product to have a product champion who can offer protection from financial and managerial restraints within the firm.
- The success of a new product depends on having the support of the elite power holders within the organization.¹⁰⁵

¹⁰¹ See [Corsten 1995]

¹⁰² See [Zaltman et al. 1973]

¹⁰³ See [Cooper 1994], p. 10.

¹⁰⁴ See [Ibid. 1994].

¹⁰⁵ See [Rosenau 1989), p. 285.

4. BUSINESS CASE: INTRODUCING PRODUCT MANAGEMENT TO THE FINANCIAL IT SOLUTION PROVIDER "DBSCI"

Implementing software product management to a specific firm is actually a strategic organizational decision of senior management which has impact on every sub-unit, department and work routine within the company. This chapter applies a) the findings of general roles and responsibilities the function has in software businesses, and b) the investigated and assessed needs for a management of products within the specific organization.

Processes of product management change when the different techniques are implemented and transitioned into use in a firm. Modification of existing key processes are needed to support the software product management at the line-of-business level. Such changes are pervasive because they change how an organization does business. Having realized all the relevant processes, it is necessary to turn from the strategic and tactical management of products to its administration and organization. Organization and implementation are the means of managing strategy into action.¹⁰⁶ The successful implementation of strategy is neither easy nor widely discussed in literature, especially the establishment of product management concepts is not entirely investigated yet. Introducing product management can be a time-consuming and complex process, but it is well worth the extra effort to do it right the first time.

4.1. PRE-PLANNING AND ASSESSING CORPORATE NEEDS

Adequate pre-planning to organizational matters concerning software product management consists of identifying what are the most corporate competitive problems, in what way product managers could help to resolve these problems, and what would be the most effective role for product managers to play in such areas.

DB Servicios de Consultoría e Informática S. A. ("dbsci")¹⁰⁷ is an information technology (IT) subsidiary of the Deutsche Bank Group. It started in Barcelona, Spain

¹⁰⁶ See [Murray / O'Driscoll 1996], p. 238.

¹⁰⁷ The partner of this study is supposed to be part of a new holding in the future that leads "dbsci" and a German sister IT subsidiary of Deutsche Bank. This new company will receive the name "e-magine" and will be headed by the current CEO of "dbsci". This new name shall help to capture new external clients by avoiding the name Deutsche Bank - a competitor to most clients. But "dbsci" is up to now still operating under its old name and the new structure has no direct impact on this works' goals, because it signifies a strategic decision a level above software product management.

in 1996 with 16 people as a Centre of Competence, focused on IT solutions for the banking and near-banking sector. Today the company is working with more than 350 staff members, and is servicing customers and partners in eight different European countries with own products, services, and solutions in more than 15 financial entities, yet mainly in subsidiaries of Deutsche Bank AG in Europe. The nearly independent company now is in a transition phase with the desire to be market-oriented, but right now it is still very technology-oriented. While such emphasis on technical skills early in the life cycle of a new high-tech start-up firm or a sub-unit of an established organization make sense, there is now the need for a transition to more of a commercial or business perspective as products enter the market. The winning of new and external clients shall help to continue growth and reputation of the company and make it a successful player in the challenging and forward-looking financial IT environment. The corporate auto-defined mission is to provide:¹⁰⁸

- Access solutions to financial institutions and near banks covering existing requirements like front-end solutions for all existing distribution and access channels (e.g., branch, internet, call-centre, WAP, agents, partnership banking, etc.), middleware, and connection to a transactional back-end allowing real-time transactions, inbound and outbound call-centres, workflows in intra- and extranets, or Java-based Thin Client platform.
- Integration services in e-banking and e-brokerage, web branch migrations, multi-channel access solutions, and core banking
- Process solutions to implement its core banking suite or modules to financial institutions including all related services (customisation, localization, integration, migration, maintenance)
- Full coverage e-business IT services (e-business development, e-consulting, e-solution development and integration, hosting, and running services)

Derived from the corporate mission we see that the business fields are several and demanding. But successful products like a core-banking solution covering all traditional transaction banking processes, or CAPA access solutions covering the integration modules for e-brokerage have no market-oriented responsables especially for the commercialisation processes. There are defined product owners who already

¹⁰⁸ Source: Adapted from an internal strategic paper

managed the development of the first releases and already have managed the implementation to some financial entities, but senior management has realized that the products are in need of professional guidance especially for the winning at new and external markets. The on-site interviews and discussions with strategists and solely technology-oriented staff members have shown as well similar results like the findings drawn by senior management. Engineers and practitioners as well are looking for somebody who "champions" the product, who has enough technical expertise to understand opportunities, is able to speak "engineers language", is acting like a centre of competence for the specific product, but also has the knowledge of the 'real' management of the product and is aware of the business impact it has.

Once having realized that there is a need of the product management function, the question and vital task of organizing it in the right way requires a detailed view on the organization as a whole, what resources are present, which people is for what responsible, and who is able to fill the function of product management with life.

The current organization chart¹⁰⁹ shows an almost exclusive technology-oriented focus. Departments and people are missing that have the educational background to master the desired strategy of openness towards external clients. Marginal marketing activities like first press releases are made by the corporate development department. The project sales and delivery department has up to now mainly experience with implementation projects within the Deutsche Bank Group without a thorough customer orientation, and also tends to be very technology-oriented with a lot of experience in project management. Due to the corporate strategic orientation that external clients (i.e., not DB subsidiaries) will contribute half of corporate turnover and profit within the next five years, the responsible department is under-represented in the organization chart. Above that, the responsible are still lacking the important level of seniority and authority essential to perform effectively. That means that the organization as a whole is in need of a strong re-engineering reform in order to achieve the set objectives.

The function of product management should play a crucial role after the reform process. Because of its important work that it has to perform in the future organization, it is essential having built later a function that exercises a leading role for the assigned products. A well implemented product management concept has to help to accomplish

¹⁰⁹ See appendix A.

the set objectives, and provides a customer orientation in a technology-oriented software company.

4.2. PRODUCT-DRIVEN ORGANIZATIONAL SET-UP FOR “DBSCI”

Organizational set-up of the function product management is strongly related to the knowing where it will be found in an organization chart, to whom it will be report, and how it will be embedded in the work routine within the software firm in the future. In the following discussion, we distinguish between a formal and an informal role. Formal organizations are defined by an organization chart, but underneath any formal organization lies an equally strong informal organization, which really determines how well the processes are implemented. A product organization is not complete when a chart is drawn. The informal system of responsibility is defined by various actors play what is valid in the NPD process, as well as for the organization of existing products. Especially the product manager has to recognize the strength and weaknesses of the formal organization and also ensures that the informal roles are filled when the development process is put into effect.

To know where product management can help best the corporate and market requirements of the company, it is necessary to take a look on how the whole organization can be formalized. Organizational principles¹¹⁰ must be applied, so that the reform has the highest impact on future business success. First step is to identify the business segments and core competences of the firm, that can be derived from the corporate mission presented in the previous chapter 4.1. The business segments are used as a basis for the organizational set-up. Step 2 is to set up lines of business in comparable sizes to observe a maximum span of control. Important is, that the business lines enable future growth, and that is established pool knowledge and competencies to satisfy customers' needs. This is to ensure that customers and colleagues should exactly know where questions can be answered.

There are several organizational forms for product focused approaches. Appendix B shows two organizational benchmarks of comparable companies of the high-tech environment and presents business lines charts as well as mixtures of formal matrix organizations with geographical and key account aspects.

¹¹⁰ Source: Arthur D. Little Research

In this thesis we define the derived core competencies from the corporate mission as business areas / lines, although an overly narrow focus on core competencies and technologies may cause a company to miss market opportunities.¹¹¹ Each of these business areas are led by a senior person which is simultaneously member of the Board of Directors. Every business area has the same functional departments and is working for the products and services belonging to the area. Product management is equally one of the departments, but with the extraordinary task the area belonging products and services to manage, i.e. the full responsibility of product line's success.¹¹²

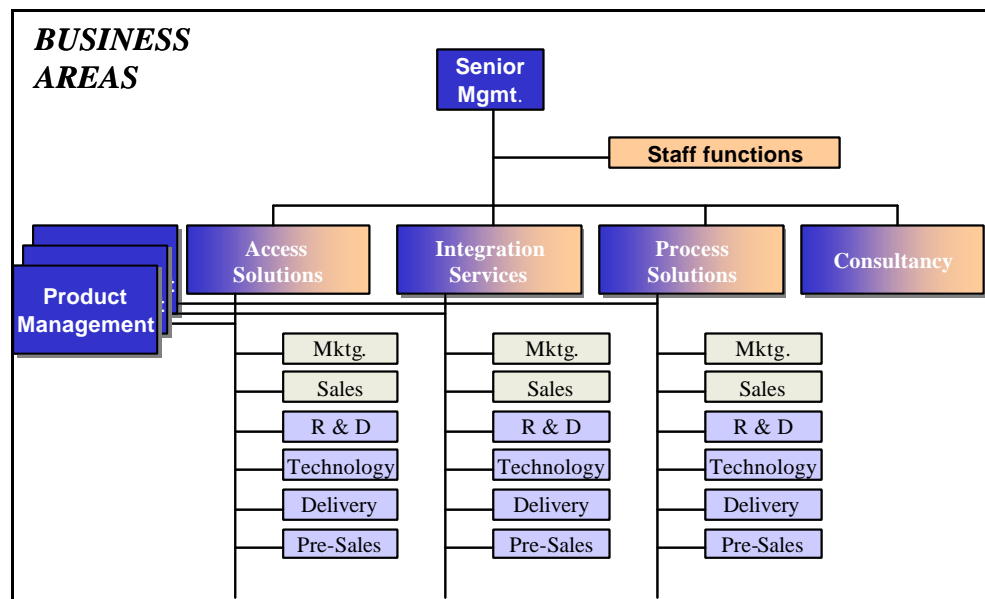


Figure 13: Proposal of new organization chart for "dbsci"

Product management is like the other functional department heads in direct reporting line to the area management, but with the special authority to use the resources the functional departments have to supply for the different NPD's and for the management of existing products and services. Figure 13 explains the informal and secondary product management organization in detail, and reflects the virtual notion of a matrix. The functional departments like sales, delivery and R&D, as well as the staff functions like marketing and finance give product management resources and information, and receive in turn support and direction. Directing the different departments seems very difficult and sensitive, and is only possible in relation with the business area manager. Close relationship between product management and business area manager is decisive.

¹¹¹ See [Meyer / Lopez 1995], p. 295.

¹¹² Notice: Marketing can alternatively be defined as a centralized staff function to establish pool knowledge for the different areas.

The area manager should patronize the appointed product manager with his or her seniority and has to make sure that team-working in this area is essential to success.

The product manager writes for example business plans for a new product to develop or to improve an existing one. These elaborated business plans¹¹³ of products that prove the business viability, or support major investments are given to the area manager requesting final approval to proceed with a project like the development of a new product, improvement of existing ones, or further promotion of a product. The business plans are proposals and are evaluated by the area manager, than approved, rejected, or modified. With the business plan approved and first-level management sending a strong message of support throughout the area, a detailed product definition phase must be implemented. The matrix notion stimulates integration of diverse skills at the working level and require flexibility of the participants. Here it is also important to ensure that the participative informal roles are assumed by appropriate people. Due to the important interface with R&D, product management should not be tempted to tell engineering how to do its work. Product management should define the end result and not the path towards this end result. During this process, product management in relation with the marketing department must continue to monitor the market for any changes in the direction or competitive threats. Both groups must work together and focus on being mutually successful. In other words, the product manager defines what to produce, and the functional department leader how it is produced.

¹¹³ See appendix C.

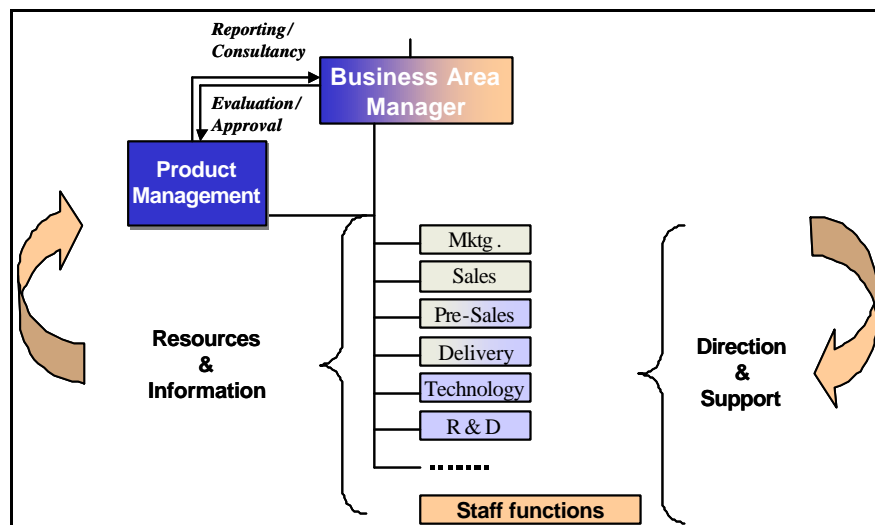


Figure 14: Virtual matrix notion of product management

Furthermore we have to distinguish between the processes for product development and for products on the market during the different stages of the software product life cycle. In the case of product development product manager should be part of a new product committee where every department inclusive the area manager are stakeholders. The committee is a special corporate task form structure of limited duration, respectively a quasi-informal organization for innovation fostering especially idea generation. For the managing of existing products that depends of the nature of market and competition facing the product, it is especially important in the software business with permanent improvements and releases of each product to have somebody who accompanies the line from idea generation to death of the product. Because of that there should not be a shift of responsibility when the product is launched to the market.

The organizational chart reflects both a focus on customers and technology. The IT departments have project managers in charge of monitoring software development, maintenance, system integration, and internal development. Product managers main function lies in the whole responsibility of their own product lines, from product development to revenues, including product definition, pricing, promotion and customer surveys. Product management is supported by marketing providing competitive analysis, and new ideas for the introduction of new products and services based on business plan evaluation. Within the product management function should be several people sharing the different tasks and processes that are necessary for success.

The portrayed tasks do not have an equal emphasis on the work of product management. Figure 15 presents an overview of different key tasks and separates them into daily work, medium-term work, and long-term work.

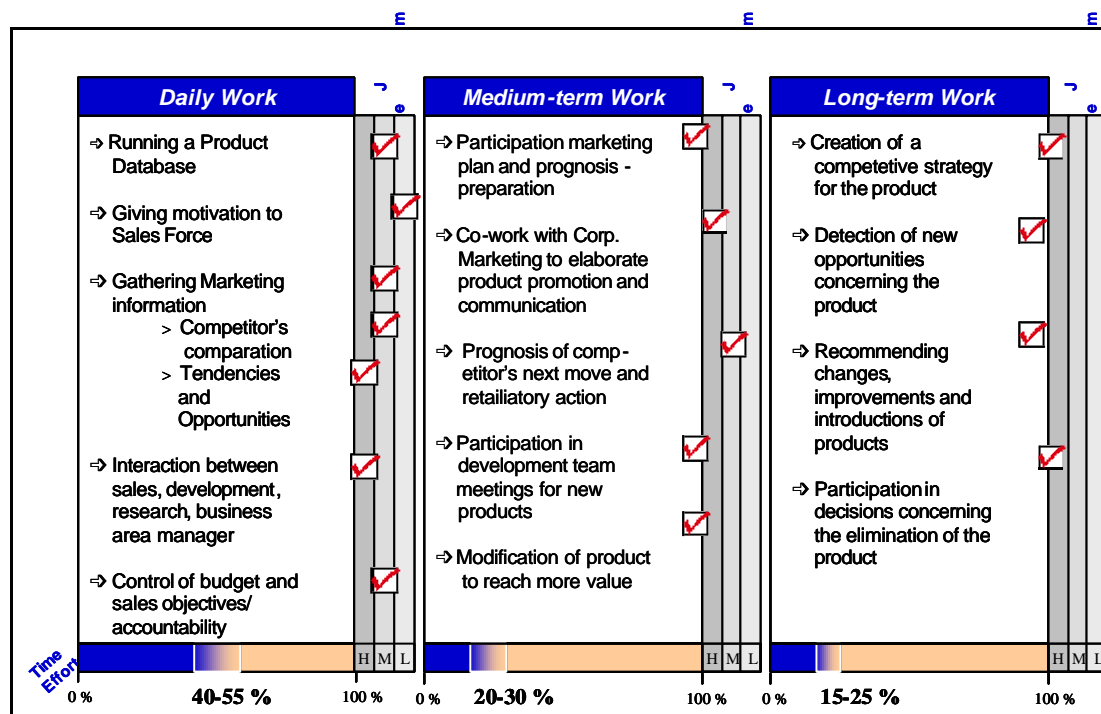


Figure 15: Timely emphasis on some key tasks

What product management actually should dealing with within "dbsci" is presented in the following chapter using a case application to describe the tasks and requirements the product management has to perform according to this organizational recommendation and the found responsibilities in software businesses.

4.3 CASE STUDY: THE MANAGEMENT OF AN E-BROKERAGE SOLUTION

With the online brokerage access solutions CAPA this chapter wants to illustrate the first product that is determined to capture external clients for "dbsci". Therefore it is also the best example for the author to explain the complexity and difficulty the designated product manager has to handle for a yet existing product. This case example excludes therefore the vital role of product management in new product development, but is today the most urgent problem to solve.

4.3.1. THE PRODUCT E-BROKER

Without going into detail, the author gives here a brief presentation of a core product of “dbsci” to give the reader an impression about the complexity of the product. CAPA is a range of software modules which enables every financial entity where it is implemented to offer e-brokerage to the final customer. This offering means for “dbsci's” clients participating in the expected explosive growth of e-brokerage especially in Europe. The e-brokerage market will grow a 400% in the next five years¹¹⁴ and Spain will become one of the fastest growing markets.¹¹⁵ The implementation of e-brokerage implies as well key success factors for every potential customer concerning market presence, broad range of products like options, futures, warrants or derivatives, services and technological leadership (e.g. multi-channel approach, automatic execution of transactions independently from office hours via internet).

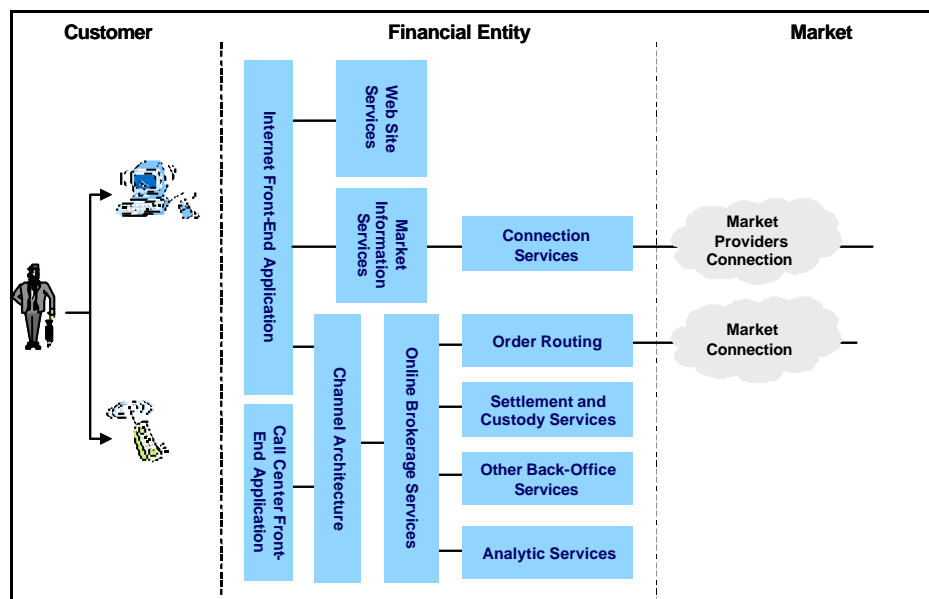


Figure 16: CAPA electronic brokerage architecture overview

Source: Internal presentation

The CAPA e-broker gives access to a great variety of information from national and international information provider, rigorous order execution and the use of ultimate technologies especially concerning security of the transactions. Figure 16 gives a brief overview how CAPA is built and where the interfaces to market and customers are, and how the financial entity as an intermediary acts in connection services or order routing.

¹¹⁴ JP Morgan 1999

¹¹⁵ See [<http://www.baquia.com>]

Easy said the components exist of a front-end, a middleware and a back-end.¹¹⁶ The front-end components are the web site services (WEB manager) with the objective to offer visitors, members and customers a complete set of services to get real-time markets information, get advisory information from business department (analyst research), and to make real-time operations through the internet channel. The middleware is a real-time software, based on open standards, that allows the fast and easy integration of the many distribution channels with different corporate' back-ends. It equips customers with all the necessary tools to fully "e-enable" their businesses. Corporate IT departments can use the middleware to deliver scalable, customer-facing multi-channel applications quickly and reliably. It allows customers to gain a competitive advantage by exploiting existing application logics. At the same time, they can seamlessly develop and integrate new applications and components. Back-end applications deal chiefly with transactional services and order management. Additional components like a customer relationship management integration are easy to integrate and existing ones are highly able to customized to potential clients' needs.



Figure 17: Reference Application for CAPA Access Solutions

Source: [http://www.dbnet24.com]

CAPA access solutions e-broker are integrated into a reference application, namely "dbnet24". The illustrated e-broker web site portal is the front-end result of the product to manage. It offers several functionalities covering the actual requirements and demands of the current e-brokerage market in Spain. With this platform Deutsche Bank Spain participates in the thriving business of brokerage through different distribution channels without that the end-user has to come into a branch of the bank.

¹¹⁶ A more detailed explanation shows the figure in appendix D.

4.3.2. DEFINITION OF TASKS AND REQUIREMENTS

While the reference application dbnet24 is managed by an appointed product manager of Deutsche Bank Spain, servicing the end user in a business-to-consumer (B2C) environment, the management of the product line CAPA with its several modules requires a different approach. It requires the management of a complex system with all its breadth and future opportunities, and the commercialisation of this product in a very narrow market with a limited number of business customers. But this approach includes also the knowledge about markets and potential customers like the dbnet24 product manager, as well as the knowledge about other suppliers of technology integration to financial entities for example.

It is seen that the simplified architecture shown in figure 16 already contains various modules the product manager is in charge of. In the following the designated product manager will find a range of tasks how the e-brokerage product should be managed so that it becomes the first successful product for the external market. Within the product's value chain and the product life cycle the product manager focuses the work from strategic marketing tasks to tactical support orientation. Strategic marketing begins with a market analysis (especially technology assessment) and a quantitative analysis to see what the market needs, what the competition does, whether the product can be profitable, and how big market size is. Analysis is followed by strategic planning and product planning that comprise essential domains like positioning, pricing, and specifications. Of more tactical nature are then sales tools, promotional communications, and channel support after the successful launch. The mentioned tasks are derived from chapter 3 and here presented only as a short guideline of tasks and tools for the appointed product manager.

I. Market Analysis and Quantitative Analysis

Although the product is already developed and yet implemented in a reference application, the analysis of the market is crucial for the first steps in capturing external clients. Fully knowledge of the market is a prerequisite for the product manager to get the product to the market and to maintain the product. Types of customers are segmented by their level of product acceptance and the method of marketing each segment is provided. Without a comprehensive quantitative analysis to product

profitability, it is not possible to determine which product is a winner and which is ready to take off the market. Tasks and topics covered:

- Market research and analysis
- Identifying distinctive competence and uncovering prospect problems
- Market and technology assessment
- Product definition
- Product profitability, sales analysis and win/loss analysis

II. Strategic Planning and Product Planning

Activities associated with this domain are regarded to be the heart of the managerial process. The position statement becomes the basis for communicating both internally and externally. Product manager's managerial support for planning and control purposes is wide-ranging for the product e-broker. Especially the domain of release management is a vital task. In this context the product management deals with:

- Software product change management, innovation, and bug management
- Planning and testing
- Product evaluation and financial effects
- Buy/build analysis and partnerships
- Position statement, product naming, and branding aspects
- Software product life cycle as a whole and in relation to sales process definition
- Team communication

III. Sales Tools, Promotional Communications, and Channel Support

The relationship between the product manager and the sales force is critical to the performance of the company, the success of the product, and the profit-effectiveness and survival of a product management structure. Items of this domain include dealing with the press, lead generation and analysis, and development of clear presentations and demonstrations. The related task keywords are:

- Marketing direction and ongoing market support
- Provision of presentation and demonstration material
- Training and white papers of the product
- Pricing guidelines to sales force
- Provision of product briefings, bulletins and reports
- Advertising expenditures, seminars and tradeshow
- Occasional corporate visits, phone support by "special" calls

The defined tasks in this section are an initial framework for the management of the e-brokerage product and are in need of a permanent improvement and modification process on the part of the participants. It is seen that there are already a multitude of tasks difficult to handle by one single person. Therefore every appointed product manager should work at least with one junior product manager in the different management teams. A senior product manager should be able and authorized to champion the presented processes and responsibilities. That leads to the question what capabilities are required from a designated product manager, because the appointment is a high-risk decision. A wrong appointment can have a negative effect on product profitability, market image of the company, and the corporate support for product management in general. Success characteristics are several and are based chiefly on marketing and technical expertise, and previous experience and accountability. Important are also the personal skills and the personality. A senior product manager should be an 'intrapreneur' and disciplined self-starter with strong abilities of communication, presentation skills, leadership and interpersonal relationship. Other desired characteristics are open-mindedness, diplomacy, organization abilities and the ability to work with people at all corporate levels. The list seems to be unlimited and emphasizes once again the crucial role of the function. Every recruited person in this domain should be therefore inducted effectively, trained entirely, and developed individually.

4.4. MEASURING PERFORMANCE AND KEEPING PRODUCT MANAGEMENT ALIVE

The actual contribution of product management to company success, especially in the context of new product development is difficult to measure. Company success is influenced by both external factors such as differences in administrative barriers or differences in infrastructure, over which the company has little control, and internal factors. Internal factors include various kinds of knowledge, production equipment, buildings, personnel, capital, and other company resources.¹¹⁷ Product management's contribution to company success should first analysed with the help of the assigned product's profitability. Financial objectives defined by market analysis and opportunity assessment are compared with actual results. Actual results could be easily calculated by revenues less costs are profits.

The definition of a profitable product is ambiguous.¹¹⁸ A product can be marginally profitable by not reaching the break-even point, and is fully profitable only above the break-even point.¹¹⁹ But break-even charts are only one option for measuring performance. Product costs, working capital, or product cash flows for example have to be added. The product manager needs to establish a framework of financial plans, budgets and controls which enable the impact of his or her decisions to be evaluated, monitored and controlled. Other participants of product management processes have as well as product managers responsibility to a product's profitability. Product managers need to present financial results in a variety of reports and at a variety of meetings and conferences. They should run a product database with product statistics including all relevant countable results in order to present them immediately by request.

Other efficiency and effectiveness control activities are the examination of which resources are being used in each element of strategy and complete strategy for itself. Performance measures and standards vary by company and situation,¹²⁰ It should cover all product management related tasks in respect to all marketing mix decisions. Problems could be occur in the evaluation of the product development process.

¹¹⁷ See [Harmsen et al. 2000], p. 195.

¹¹⁸ See [South / Oliver 1998], p. 188.

¹¹⁹ See figure 3.

¹²⁰ See [Hutt / Speh 1998], p. 544.

The concept of product management itself requires also a constant audit and improvement. From time to time the product management participants should evaluate in an audit following questions:¹²¹

- Is product management right for the company in the future? What organization structure is most appropriate?
- Is the adopted approach coping with competitive pressures? Do we have improvements?
- What are current attitudes towards product managers? Are they seen as competent and professional?
- What adjustments of changes to the practice should be considered, planned, and implemented?
- Who should have accountability for what? What profile of product managers is required?

Such questions should be continually asked and answered to improve the function of product management within the organization, and keeping product management alive for "dbsci". A formal audit benefits the stakeholders of product management a greater understanding of roles and relationships, and a more in-depth understanding of the nature of the function. Strengths and weaknesses are identified and ensure that the concept contributes the benefits it promises as defined in the definition in the second chapter.

4.5. ADVANTAGES AND DISADVANTAGES OF THE PROPOSED CONCEPT

Implementation of the product management concept into the company's organization promises several advantages for improvement of each product's success. Expertise, leadership, and responsibility of a product, service or product line are concentrated to a single function.

This pool knowledge enables internal personnel as well as customers a direct link to their questions and problems concerning product's features. First level management knows who is accountable and is consulted by product management in questions of strategy. Constant monitoring of the market place permits a quick reaction to new requirements and specifications in NPD, and a concentration on developing a cost-

¹²¹ See [Handscombe 1989], p. 219.

effective application of the marketing mix for mature products. Product managers can become product-market interface experts and bring management focus to problems and opportunities for the product. Committees with more stakeholders in this context could get problems in decision-making. Product management is expected to manage the decisive marketing - R&D interface which is commonly accepted as one of the most critical success factors in high-tech and software building companies. Furthermore the function is an excellent training ground for young executives, because it involves them in almost every area of company operations.¹²²

But product management signifies also some disadvantages. If the appointed product managers are not given enough authority to execute their above defined role and responsibilities effectively the organizational set-up creates some conflict and frustration at least in the product management department, but also in the functional departments. As a consequence they have to go over heads of others to get something done, or competition among different product managers for the share of resources is caused. Bulky plans to justify more resources than the next product manager is the consequence. A fragmentation of the corporation can occur. Second, being neither real member of a marketing department nor the technological departments it seems rather difficult acting as a real expert in both fields. A third disadvantage is, that product management tends to be costly. If the product managers are to be involved in the total business, as they should be, it is virtually impossible for them to do the job without the help of assistants. Junior product managers are recruited and product teams are the result, what have impact on the firm's payroll. Fourth, a strong focus on financial results may lead to short-term profit orientation and reduced willingness for risk taking.

The clear advantage of the proposed concept is the clear structure on core competencies, and that the assigned product managers as a staff function to area management will have the authority to use the resources the functional departments can provide. They will provide excellence for the managed lines and be competent partners for all product-related information and knowledge.

¹²² See [Kotler 2000], p. 685.

Mandatory that the proposed concept works effectively and eliminates the most disadvantages depends on some messages of first-level management. The decision to introduce the product management concept requires a strong patronage on the part of senior management.¹²³ Current product owners must handing over product responsibility, and product management must given authority and seniority to use resources from the functional departments, so that there is a "quasi" - reporting line towards product management level.¹²⁴ Besides the defined area manager must be involved in decisive strategies concerning the products to give project appraisal and approval.

Generally it can be assumed, that the implementation of product management improves corporate planning capabilities, increases the ability of adjustment to market changes, and promotes the cooperation and co-work of the different divisions of the company.¹²⁵ However missing support on part of the involved departments and decision-makers the advantage is easily converted to a lack of motivation and resignation on part of the assigned product managers.

¹²³ See [Handscombe 1989], p. 138.

¹²⁴ See [Corsten 1995]

¹²⁵ See [Nieschlag et al. 1997], p. 998.

5. CONCLUSIONS

Software product management is a business function that manages the definition, development, evaluation, use, maintenance, and evolution of software products over time. It is strategic in nature and typically performed at a level above an individual project organization. Product organizations develop the requirements for product families based upon market needs, and coordinate their timely development through a series of software product releases. Software product management plays a crucial role in these processes by leadership, accountability, decision-making, and interface management. If implemented well, software product management is a major management task within a company and provides the investigated financial IT solution provider for its software product management a promising organizational concept to accomplish the set objectives of external market orientation.

The initial introduction needs to be well planned and implemented to achieve early success. One of the most common reasons for poor acceptance, support and achievement of product management is a lack of understanding is a lack of understanding the firm's interpretation of the concept and implied culture. The several stated patronage on part of senior management seems to be essential.

Apart from top corporate management, members of product management are the only ones of a company who deal with all aspects of the company's business. They have to be generalists who coordinate the activities of specialists. Especially the first appointed product managers should be real experts and senior people with strong 'soft' and 'hard' skills. In any other case, the concept is tends heavily to fail.

This thesis makes contributions to several levels. Most important value for the partner of this thesis is actually the consulting service of recommending in chapter four an appropriate software product management concept, that also affects the company as a whole. But the rather descriptive part of giving an overview of product management and presenting processes in software marketing management provides a value-add, because of the yet missing business impact knowledge throughout the technology-oriented organization. This part is essential to present corporate decision-makers and the readers of this work what product management is and stands for, which processes are needed to manage software products, and why implementation and the keeping alive of the function is actually a difficult task. It is mandatory that the appointed

people for software product management is aware of having a broad range of instruments to fulfil the function.

However, on the basis of the variety of facts concerning different approaches to the role of product managers, and in discordance of product managers' several duties and tasks described in literature, it is hardly feasible to implement a best practice to satisfy "dbsci's" needs and demands. As stated several times, and due to the dynamic nature of software businesses, the most effective software product management concept for any company will only be achieved by constant review on the assigned processes. This work can only give a basic guideline. In general, the appropriate organizational structure is determined by the inter-relationship of several factors. Among them are: corporate culture, number and diversity of product lines, number of sales channels, number and diversity of markets served, and product line or corporate volume of sales.

REFERENCES

(in alphabetical order)

ALONSO, F. / JURISTO, N. / MATÉ, J. L., PAZOS, J., Software Engineering and Knowledge Engineering: Towards a Common Life Cycle, in: *Journal of Systems Software*, Vol. 33 (1996), pp. 65 – 79.

AYMERICH, Jordi / TARRAGÓ, Victor, Dirección de Producto, Apuntes Sintéticos, Universitat de Barcelona y Escuela Superior de Administración y Dirección de Empresas (ESADE), 1997.

BARTON, D. L. / WILSON E. / DOYLE J., *Commercializing Technology: Understanding User Needs, Reading 6 from Business Marketing Strategy* (Concepts and Applications), Irwin, 1994.

BEARD, Charles / EASINGWOOD, Chris, *New Product Launch – Marketing Action and Launch Tactics for High-Technology Products*, in: *Industrial Marketing Management*, Vol. 25, 1996, pp. 87 – 103.

BERTHON, Pierre / HULBERT, James M. PITT, Leyland F., *Brand Management Prognostications*, in: *Sloan Management Review*, pp. 53 - 65, Winter 1999.

BOOZ, ALLEN and HAMILTON, *New Product Management for the 1980s*, Booz, Allen and Hamilton, New York, 1982.

BRANDENBURGER, A. M. / NALEBUFF, B. J., *The Right Game: Use Game Theory to Shape Strategy*, in: *Harvard Business Review*, July – August 1995, pp. 57 – 71.

BUELL, Victor P., *The Changing Role of the Product Manager in Consumer Goods Companies*, in: Kotler / Cox (Ed.): *Marketing Management and Strategy*, pp. 339 - 349, Prentice Hall, Englewood (NJ), 1980.

CALANTONE, Roger J. / DIBENEDETTO, C. Anthony / HAGGBLOM, Ted, *Principles of New Product Development: Exploring the Beliefs of Product Practitioners*, in: *JPIM*, Vol. 12, 1995, 235 – 246.

CALANTONE, Roger / MONTOYA-WEISS, Mitzi, *Product launch and follow-on*, in: *Managing New Technology Development*, William E. Souder and J. Daniel Sherman (eds.), McGraw-Hill, New York, 1994, pp. 217 – 248.

CHERNATONY, Leslie / McDONALD, Malcolm, *Creating Powerful Brands*, Butterworth / Heinemann, Oxford, 1992.

CLARK, K. B., *The Interaction of Design Hierarchies and Market Concepts in Technological Evolution*, in: *Research Policy*, Vol. 14 (1985), pp. 235 – 251.

COOPER, Robert G., *Winning at New Products: Accelerating the Process from Idea to Launch*, 2nd ed. Reading, Mass.: Addison Wesley, 1993.

COOPER, Robert G., *Overhauling the New Product Process*, in: *Industrial Marketing Management*, Vol. 25, 1996, pp. 465 – 482.

COOPER, Robert G. / KLEINSCHMIDT, E. J., *Benchmarking the firm's critical success factors in new project development*, in: *JPIM*, 12, 1995, pp. 374 – 391.

CORSTEN, Hans, *Lexikon der Betriebswirtschaftlehre*, 3rd ed., R. Oldenbourg Verlag, 1995.

DAVIDOW, William H., *High Tech Marketing: Der Kampf um den Kunden - Erfahrungen und Rezepte eines Insiders*, 2. Auflage, Campus Verlag, Frankfurt/Main, 1988.

DIBENEDETTO, C. Anthony, *Identifying the Key Success Factors in New Product Launch*, in: JPIM, Vol 16, (1999), pp. 530 – 544.

DUMAINE, Brian, *Corporate Spies Snoop to Conquer*, Fortune, November 2, 1988, pp. 68 - 76.

FAYAD, Mohamed E. / SCHMIDT, Douglas C. / JOHNSON, Ralph E., *Implementing Application Frameworks – Object-Oriented Frameworks at Work*, John Wiley & Sons, New York, 1999.

FRIES, James A., *Library Support for Industrial Market Research*, Industrial Marketing Management, February 1979.

GARVIN, David A., *The Process of Organization and Management*, in: Sloan Management Review, pp. 33 - 48, Summer 1998.

GOBELI, David H. / KOENIG, Harold F. / BECHINGER, Iris, *Managing Conflict in Software Development Teams: A Multilevel Analysis*, in JPIM, Vol. 15, (1998), pp. 423 – 435.

HAGGBLOM, Ted / CALANTONE, Roger G. / DIBENEDETTO, C. A., *Do new product development managers in large or high-market-share firms perceive marketing – R&D interfaces principles differently?*, Journal of Product Innovation Management 12 (1995), pp. 323 – 333.

HANDSCOMBE, Richard S., *The Product Management Handbook: your practical guide to improving and sustaining results*, McGraw-Hill Book Company, Maidenhead, England, 1989.

HARMSSEN, Hanne / GRUNERT, Klaus G. / BOVE, Karsten, *Company Competencies as a Network: The Role of Product Development*, in: JPIM, Vol. 17 (2000), pp. 194 – 207.

HINLEY, David S., *Software evolution management: a process-oriented perspective*, in: Information and Software Technology, Vol. 38, 1996, pp. 723 – 730.

HOWELL, JANE M., *Champions of Technological Innovation*, Administrative Science Quarterly 35, June 1990, pp. 317 – 341.

HULTINK, Erik Jan / HART, Susan / ROBBEN, Henry S. J. / GRIFFIN, Abbie, *Launch Decisions and New Product Success: An Empirical Comparison of Consumer and Industrial Products*, in: JPIM, Vol. 17 (2000), pp. 5 – 23.

HUTT, Michael D. / SPEH, Thomas W., *Business Marketing Management – A strategic view of industrial and organizational markets*, 6th ed., Dryden Press, Orlando, 1998.

IANSTITI, Marco / MACCORMACK, Alan, *Developing Products in Internet Time*, in: Harvard Business Review, September - October 1997, pp. 108 - 117.

KATZENBACH, JON R. / SMITH, DOUGLAS K., *The Discipline of Teams*, Harvard Business Review 71, March / April 1993, p. 112.

KOTLER, Phillip, *Marketing Management: The Millenium Edition*, Prentice Hall International, Englewood (NJ), 2000.

- LAYZELL / MACAULEY**, *An investigation in software maintenance – perception and practice*, Proceedings Conference on Software Maintenance, San Diego, IEEE Comp. Soc., 1990, pp. 1130 – 1139.
- MACNAMEE, Brian / MCDONNELL, Ray**, *The Marketing Casebase*, Routledge, London, 1995.
- MAHIN, Phillip W.**, *Business-to-Business Marketing: Strategic Resource Management and Cases*, 1991, title out of print.
- MCDONALD, Malcolm H. B.**, *Marketing Plans: How to prepare them, How to use them*, Heinemann, London, 1984.
- MERRILL LYNCH**, *e-banking in Europe: Pan European e-banking Review*, May 2000.
- MEYER, Marc H. / LOPEZ, Luis**, *Technology Strategy in a Software Products Company*, in: JPIM, Vol. 12 (1995), pp. 294 – 306.
- MURRAY / O'DRISCOLL**, *Strategy and Process in Marketing*, Prentice Hall, Englewood (NJ), 1996.
- NIESCHLAG / DICHTL / HÖRSCHGEN**, *Marketing*, 18th ed., Duncker & Humblot, Berlin, 1997.
- O'CONNOR, Paul**, *Implementing a Stage-Gate Process: A Multi-Company Perspective*, in: JPIM, Vol. 11 (1994), pp. 183 - 200.
- RANGAN, V. K. / BARTUS K.**, *New Product Commercialization*, Reading 4 from Business Marketing Strategy (Concepts and Applications), Irwin, 1994.
- ROBERTS, E. B.**, *Generating Technological Innovation*, Oxford University Press, Oxford, 1987.
- ROSENAU, M. D. Jr.**, *From experience: schedule emphasis of new product development personnel*, in: JPIM, Vol. 6 (1989), pp. 282 – 288.
- ROSENTHAL, Stephen R.**, *Effective Product Design and Development: How to Cut Lead Time and Increase Customer Satisfaction*, McGraw-Hill Companies, 1992.
- SCOTT, George M.**, *Critical Technology Management Issues of New product Development in High-Tech Companies*, in: JPIM, Vol. 17 (2000), pp. 57 – 77.
- SELIGER, Robert / MEYER, Marc H.**, *Product Platforms in Software Development*, Sloan Management Review, Fall 1998, pp. 61 - 74.
- SHANKLIN, W. / RYANS, J.**, *Marketing High Technology*, Lexington Books, Toronto, 1984.
- SOUDER, William E.**, *Managing Relations between R&D and Marketing in New Product Development Projects*, Journal of Product Innovation Management 5, 1988.
- SOUDER, Wm. E. / SHERMAN, J. Daniel**, *Managing New Technology Development*, McGraw-Hill, New York, 1994.
- SOUTH, John B. / OLIVER, John E.**, *What is a Profitable Product*, in: Industrial Marketing Management, Vol. 27 (1998), pp. 187 – 195.
- STONE, John A.**, *Developing Software Applications in a Changing Environment – Management Strategies and Techniques*, McGraw – Hill, New York, 1996.
- TESSLER, Shirley / BARR, Avron**, *A Pilot Survey of Software Product Management*, SCIP Software Industry Study, Stanford Computer Industry Project, Stanford, July 31, 1996.

References

URBAN, Glen L. / HAUSER, John R. / DHOLAKIA, Nikhilesh, *Essentials of New Product Management*, Prentice Hall, Englewood Cliffs, 1987

WARD, Scott / LIGHT, Larry / GOLDSTINE, Jonathan, *What High-Tech Managers Need to Know About Brands*, Harvard Business Review, July-August 1999.

WHITTEN, Neal, *Managing Software Development Projects – Formula for Success*, 2nd ed., John Wiley & Son, New York, 1995.

WORKMAN, John P. Jr., *Factors Contributing to Marketing's Limited Role in Product Development in Many High-Tech Firms*, Journal of Market Focused Management, Vol. 2 (1998), pp. 257 – 279.

ZALTMAN, G. / DUNCAN, R. / HOLBECK, J., *Innovations and Organizations*, Wiley, New York, 1973.

INTERNET - SOURCES

AMERICAN MARKETING ASSOCIATION, Glossary, <http://www.ama.org>

ANDERSEN CONSULTING, <http://www.ac.com>

ARTHUR ANDERSEN, *Measuring eBusiness effectiveness in the financial services industry: banking*, in: Financial Services Research papers, Brokerage and Banking, from: <http://www.arthurandersen.com>

BAQUÍA INTERNACIONAL, <http://www.baquia.com>

BROKAT, <http://www.brokat.com>

DEUTSCHE BANK SPAIN,

Main Site: <http://www.deutsche-bank.es>

Reference brokerage application: <http://www.dbnet24.com>

DB SERVICIOS DE CONSULTORÍA E INFORMÁTICA S.A., <http://www.db-sci.com>

IBM, <http://www.ibm.com>

KPIT, <http://www.kpit.com/businessareas/prodmgmt2.html>

MICROSOFT, *MS Solutions Framework: Team Model for Application Development*
<http://www.microsoft.com/technet/Analpln/team.asp>

PRODUCT DEVELOPMENT AND MANAGEMENT ASSOCIATION, PDMA,
<http://www.pdma.org>

Glossary: <http://www.pdma.org/glossary.html>

Barone: <http://www.pdma.org/visions.html>

S1, <http://www.s1.com>

STAGE-GATE Process, <http://ww.stage-gate.dk>

INTERNAL PAPERS AND PRESENTATIONS

- Diverse internal and confidential strategy papers
- DB-intranet resources (Organization Chart)
- Presentation for Organization by Arthur D. Little Research

APPENDIX A

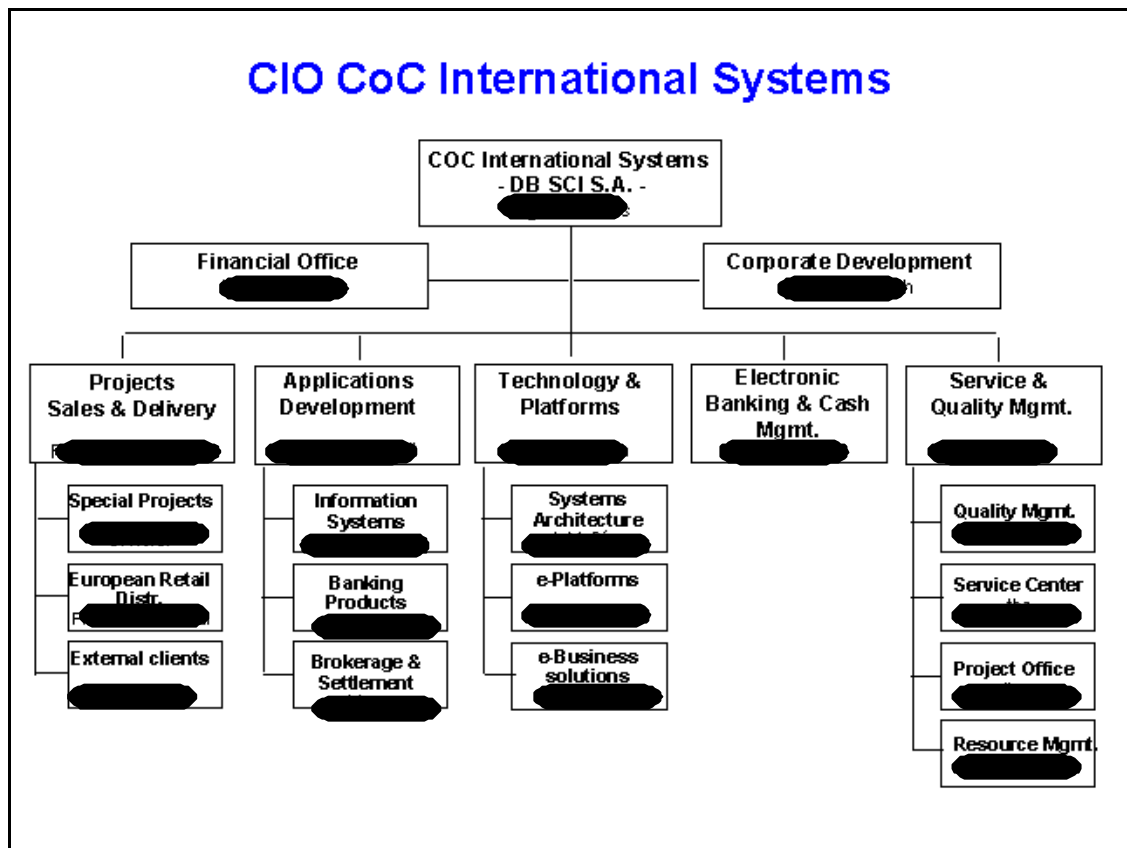


Figure A: Current Organization Chart of "dbsci"

Source: "dbsci" intranet

APPENDIX B

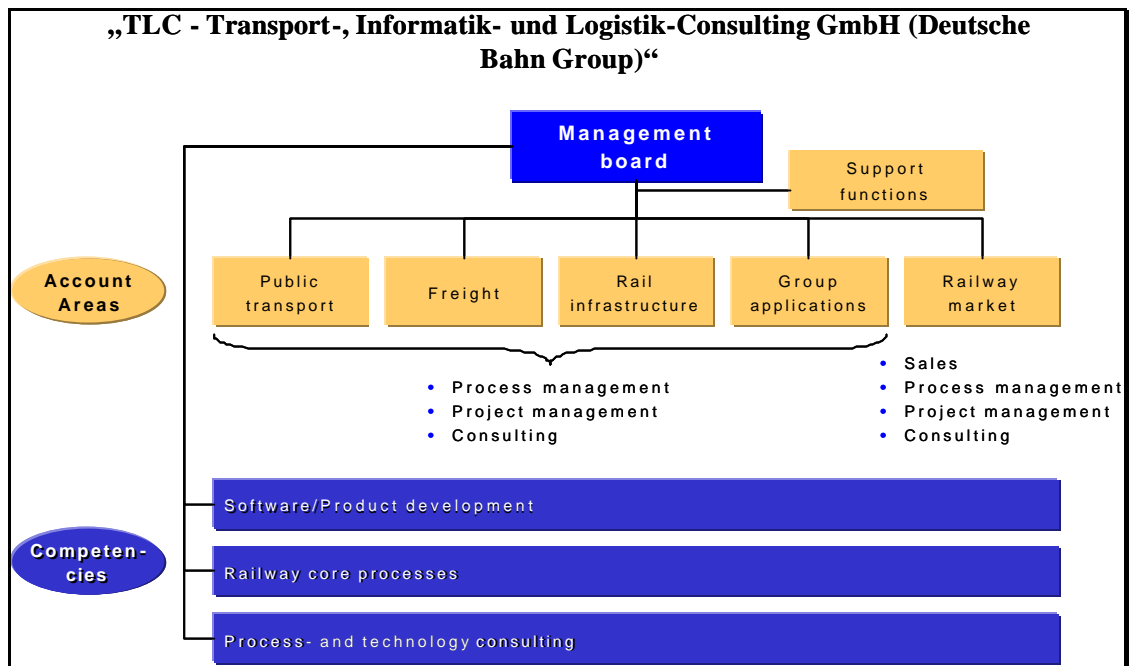


Figure B 1: Organization Chart TLC (Deutsche Bahn)

Source: Arthur D. Little Research

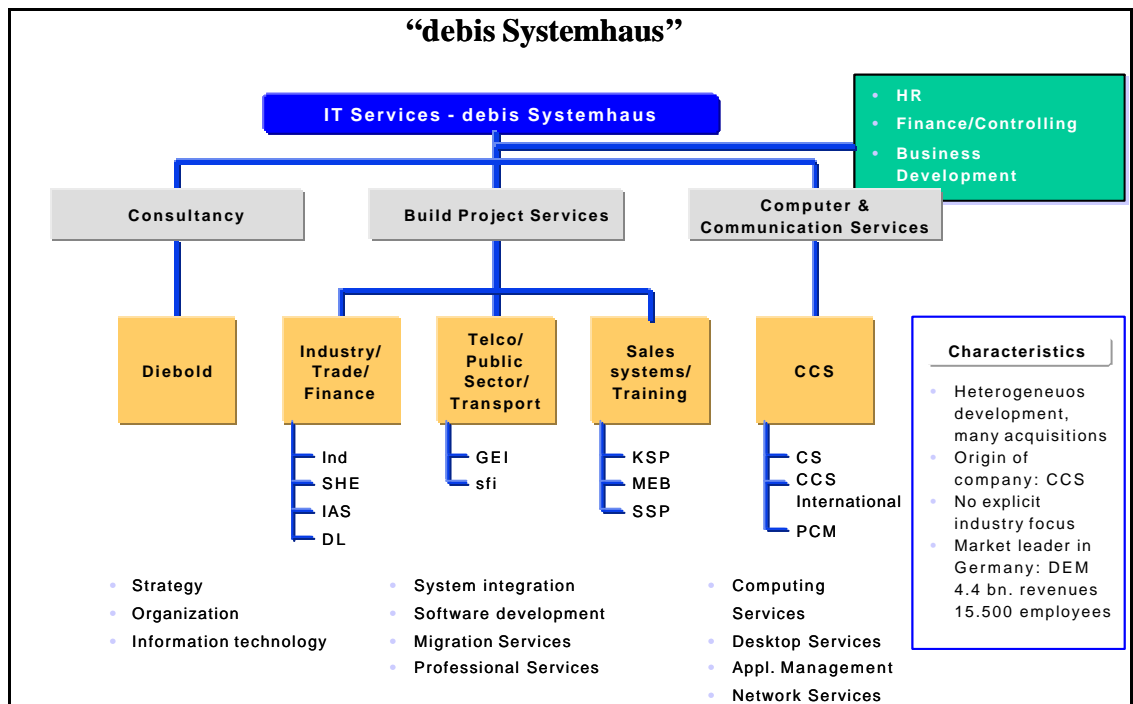


Figure B 2: Organization Chart "debis" Systemhaus - IT Services

Source: Arthur D. Little Research

APPENDIX C

Business Plan Contents

(See [Whitten 1997], p. 154)

Executive Summary

SECTION 1: What are we trying to accomplish?

- Mission Statement
- General background
- Business goals and milestones
- Business case (summary)
- Measures of success

SECTION 2: How we are going to accomplish it?

- Vision and strategy
- Technical approach
- Operational concepts
- Strategic alliances
- Financial plans

SECTION 3: Development Plan

- Product descriptions
- Development approach
 - Work plan / deliverables
 - Schedules and milestones
 - Budgets and controls

SECTION 4: Management Plan

- Management Team
- Management controls
- Supplier management
- Quality control
- Risk management

SECTION 5: Marketing Plan

- Target market and customers
- Marketing strategy
- Producer / consumer model
- Sales and distribution
- Competitive analysis

APPENDIX A	Glossary of terms
APPENDIX B	Benchmarking results
APPENDIX C	Business case details
APPENDIX D	Other backup materials

APPENDIX D

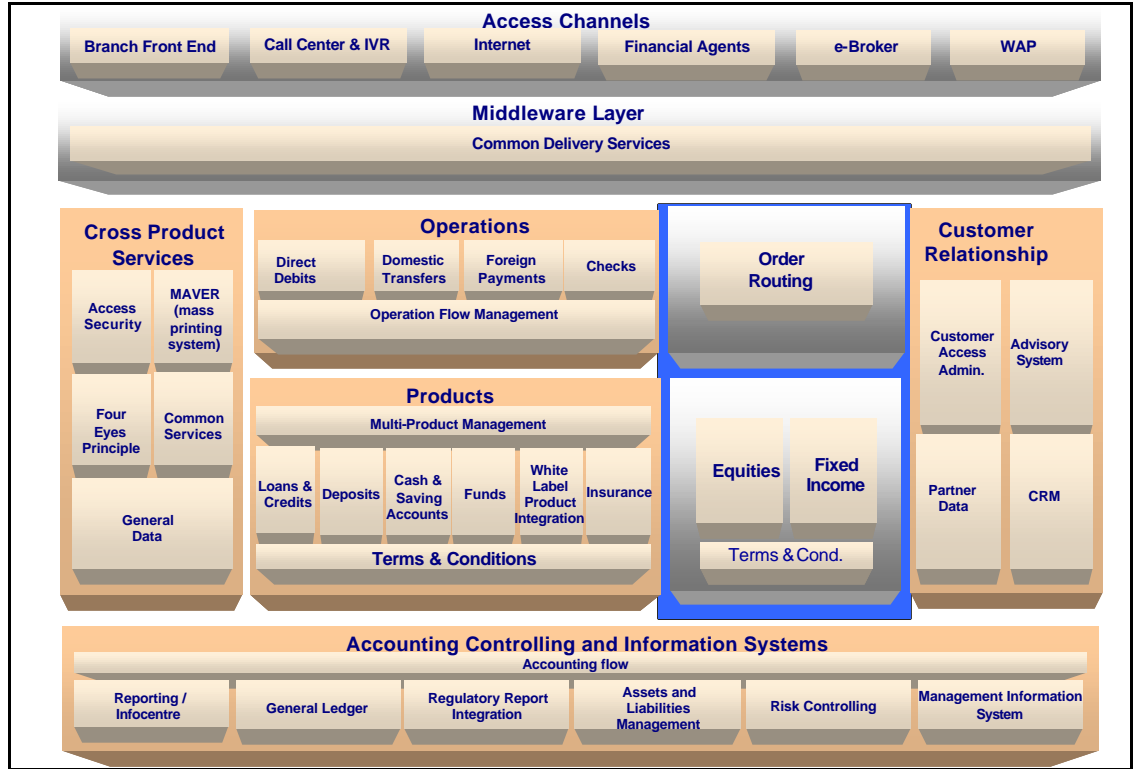


Figure D: Components of CAPA electronic brokerage systems
 Source: "dbsci" internal presentation

EIDESSTATTLICHE ERKLÄRUNG

Ich erkläre hiermit an Eides Statt, daß ich die vorliegende Arbeit selbständig und nur unter Verwendung der angegebenen Hilfsmittel angefertigt habe; die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sind als solche kenntlich gemacht.

Die Arbeit wurde bisher keiner anderen Prüfungsbehörde vorgelegt und auch noch nicht veröffentlicht.

Paderborn, den 27.11.2000

Burkhard Rode