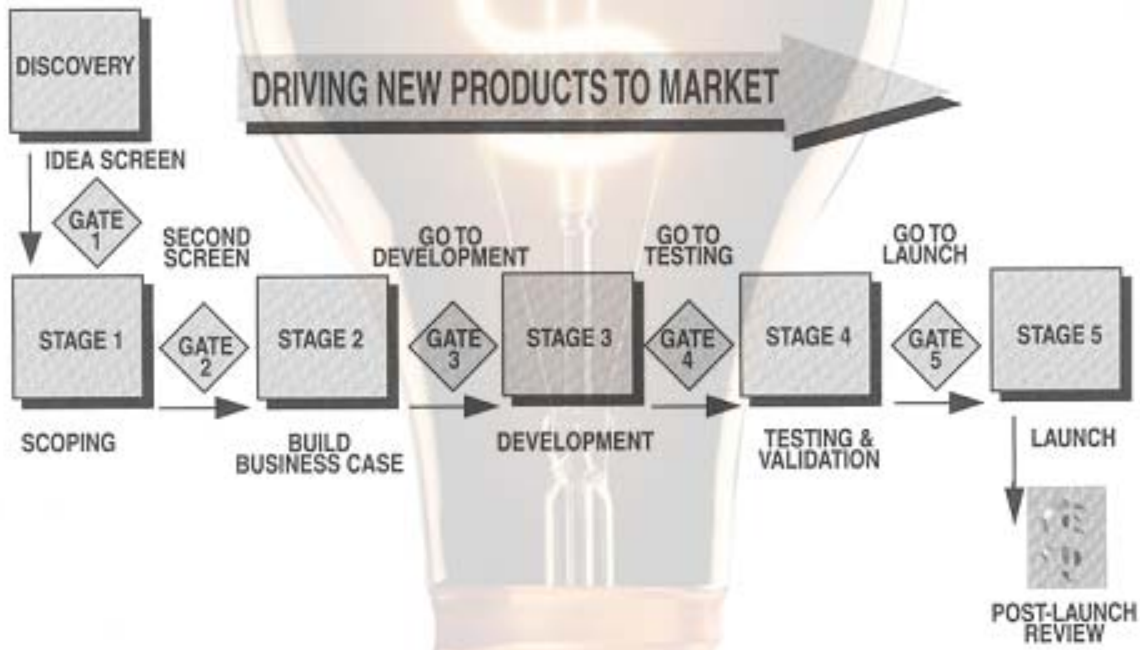
Processes and Activities to Reduce New Product Failure



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Bachelor Thesis, June 2003

Preface

Since January we have been thinking and writing on our bachelor thesis, which is the final course before examination. During this period we have learned about the complexity of product development, and the complexity of writing a thesis on the subject.

We would like to thank our tutor Wayne Strong for his enormous support and patience. We would also like to thank Jan Blomberg for arranging the interviews at Findus, and Bengt Löfstedt at C Technologies for participating.

…….. ……..
Marcus Behrens Jakob Waldemarsson

Ronneby, June 6th 2003

Abstract

Title: Processes and Activities to Reduce New Product Failure

Authors: Marcus Behrens
Jakob Waldemarsson

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Problem: New product development is an imperative for a company's survival. Depending on the definition of failure 80-95 % of all new products fail. Extensive research has been carried out in purpose of reducing new product failure rates, but in general the failure rates have not decreased.

This thesis is focusing on the new product development process, and which activities companies should undertake to reduce their new product failure rates.

Purpose: We intend to compare product development methods and theories with the practice at companies, and investigate whether formal product development processes and failure rates are connected.

Methodology: We have chosen to carry out case studies at Findus and C Technologies. The empirical data was gathered through interviews with key staff.

Conclusions: From our empirical data we cannot find a direct connection between usage of formal new product development processes and reduced failure rates. However we believe that without a formal new product development process the failure rates would be even higher.

Our empirical data gives support for the conclusion that the market should direct product development.

We have caught a glimpse of some problems not related to the new product development process itself. These problems include competition and personal commitment.

Sammanfattning

Titel: Processer och aktiviteter för att minska graden av produktmisslyckanden

Författare: Marcus Behrens
Jakob Waldemarsson

Handledare: Wayne Strong

Problem-formulering: Produktutveckling är vitalt för ett företags överlevnad. 80-95 % av alla nya produkter misslyckas beroende på definitionen av misslyckande. Omfattande forskning har gjorts inom ämnet med syfte att minska graden av produktmisslyckanden. Trots detta har graden av misslyckanden generellt ej minskat.

Denna kandidatuppsats fokuserar på produktutvecklingsprocessen och de aktiviteter som företag bör överväga för att minska graden av produktmisslyckande.

Syfte: Vi har för avsikt att jämföra teorier inom produktutveckling med de metoder som används i praktiken, och därigenom undersöka huruvida det finns ett samband mellan formella utvecklingsprocesser och graden av misslyckande.

Metod: Vi har valt att genomföra fallstudier på Findus och C Technologies. Empirin samlades in genom intervjuer med nyckelpersoner på respektive företag.

Slutsatser: Utifrån empirin kan vi ej finna ett direkt samband mellan formella produktutvecklingsprocesser och graden av misslyckande. Däremot har vi uppfattningen att graden av misslyckande skulle vara ännu högre utan en formell utvecklingsprocess.

Vår empiri ger även stöd för slutsatsen att marknaden skall styra produktutvecklingen.

Vi har skymtat några av de problem som ej är relaterade till produktutvecklingsprocessen i sig. Dessa problem berör bland annat konkurrens och personligt engagemang.

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1. Introduction

Since 80 – 95 % of all new products fail[1], depending on the definition of failure, we find it interesting to investigate how to minimize the risk of failure. Extensive research has been carried out, both on a corporate and an academic level, in purpose of reducing new-product failure rates. Despite this fact the failure rates of new products in general have not decreased.[2]

However, companies such as Procter & Gamble, IBM, and Hewlett Packard have improved their new-product failure rates through disciplined marketing processes, and succeeded over and over again.[3] The common element among these companies is according to Berggren that they have a formal "stage-gate" process for new product development[4].

The importance of new product development can be visualised in a very simple context and formula: Profits = Revenues – Costs. New product development is essential to companies while they make profits from offering products or services to a price that exceeds the costs.[5] The fact that products don't sell forever also adds to the importance of developing new products. Each product has a limited life cycle involving five stages: product development, introduction, growth, maturity and decline. Figure 1 shows a typical product life cycle.[6]

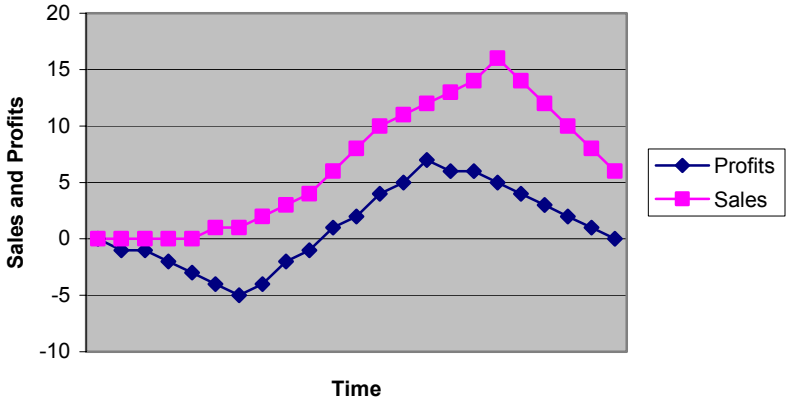

Figure 1. Product Life Cycle

[1] Berggren, E, Feb 2000
[2] Berggren, E, Aug 2001
[3] Berggren, E, Feb 2000
[4] Berggren, E, 2003-05-09
[5] Afuah, A, p. 4-5, 1998
[6] Kotler, P, p. 626-627, 1999

On a company level companies can create economic growth in internal or external ways. Anderton defines internal growth as higher output within a firm, and it could be achieved through increased investments or increased labour force. Merger, amalgamation and takeover are some of the external ways to realize higher growth rates.[7]

Corporate growth leads to economic growth and is therefore important in a macroeconomic point of view. The profits from durable economic growth for a nation are several, for instance economic growth increases government finances, and will give possibilities like better welfare, higher spending on health care and education, or improved infrastructure.[8] In this context it is clear product development is an issue of significance even outside the micro-level.

2. Purpose

The introduction leads us to the following question: What product development processes should a company consider when developing new products to reduce the risk of failure?

We want to compare product development methods and theories with the practices in companies, and investigate whether formal product development processes and failure rates are connected.

[7] Anderton, A, p.414-415, 2000
[8] Parkin, M, p. 512-513, 1998

3. Methodology

This chapter aim to describe our methodological choices during the writing process of our thesis. In the end of this chapter we will discuss validity, reliability, and the ability to generalize our conclusions. The work has been developed through the following process.

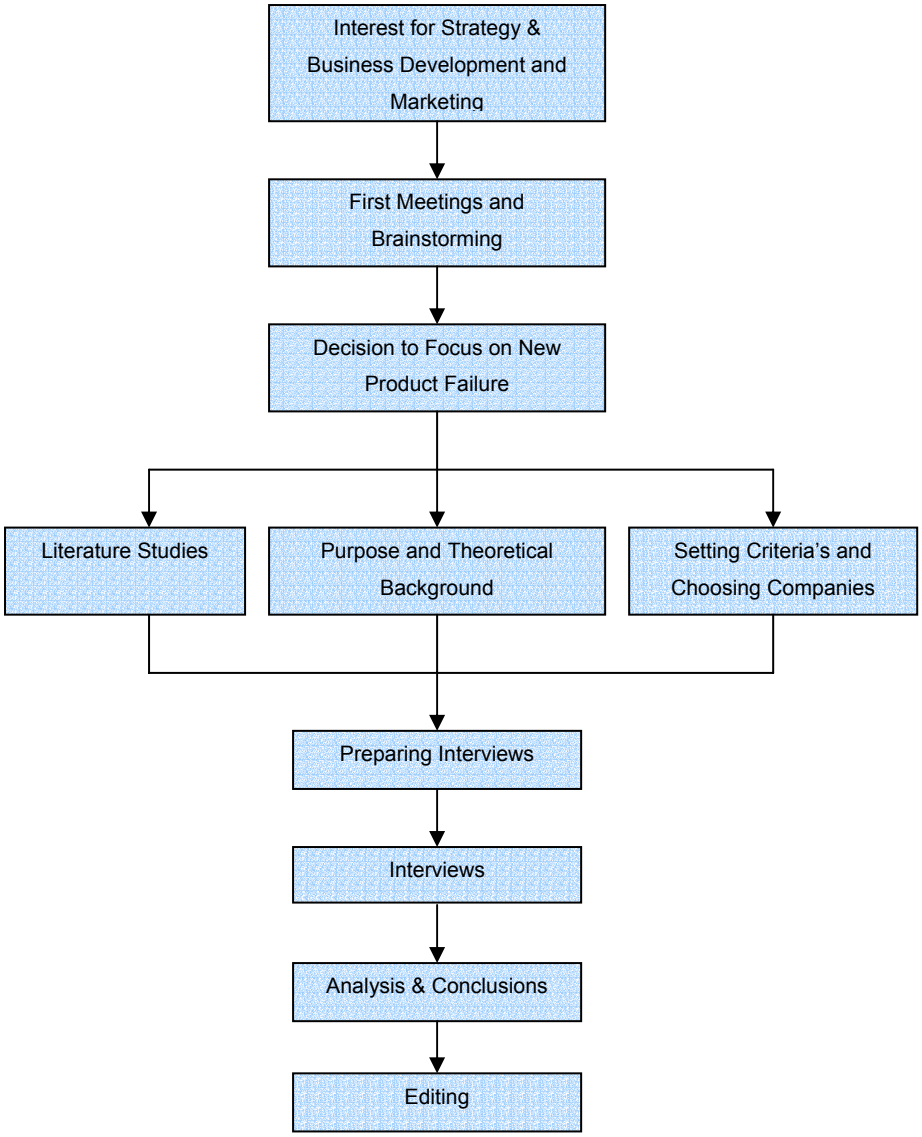

Figure 2. Thesis process

3.1. Background

During our third year of business studies at Blekinge Institute of Technology we took a special interest in strategy and management. During the course Strategy & Business Development, our teacher Wayne Strong discussed the high failure rates of new products. We were already aware of this fact since studying Kotler's well-known Principles of Marketing, but now a particular interest

in finding the reasons why new products fail arose. At our first meetings in January we decided to focus our bachelor thesis on the marketing aspects of why new products fail. In February we met Henrick Gyllberg, responsible for bachelor theses at the Department of Business and Administration. He recommended us to contact Wayne Strong, with ten years of consultancy experience, who at the moment was situated in Melbourne, Australia, too find out if he wanted to tutor our thesis. At the same meeting we decided to write the thesis in English, since Wayne Strong does not master the Swedish language. Wayne was not physically present in Ronneby until May 1st, and until then we communicated via e-mail.

At this point our literature studies focused on marketing, positioning, and innovation management. When we became acquainted with Cooper's research and Harvard Business School's publication Business Fundamentals, our thesis became more focused on the new product development (NPD) process, and its impact on product failure. Marketing aspects were still relevant, but as a part of the NPD process.

3.2. Choice of Methodology

We have chosen to carry through our empirical data collection through a light version of a case study, with the purpose to test the theories presented in our thesis with practice. Lundahl and Skärvad discuss that case studies can have four different purposes, where one of these is to try out theory against practice[9]. Besides the support that Lundahl and Skärvad give for this technique, the reason for using this methodology is based on the subject complexity. We were convinced that case studies was a suitable method to achieve a deeper understanding of what marketing and product development issues companies should consider when developing new products. The method for data collection was face-to-face interviews with key staff at the participating companies' headquarters.

3.2.1. Selecting Criteria's and Arranging Interviews

At an early stage we agreed to the following criteria's of the companies we wanted to investigate. They should:

- Develop their own products
- Have their own R & D department
- Have at least five years experience of product development

[9] Lundahl, U, p.187, 1999

We wanted to compare two companies in different branches that met the set criteria's. This approach was appropriate since we had the opinion that a comparison between theory and two companies in different branches would provide us with a broader perspective of NPD processes used in practice. Lundahl and Skärvad, who state that case studies together should illuminate situations in different branches, since it in a better way illustrates the different situations that companies are working with, support our choice. They also assert the advantage of comparing companies of different size. Further they point at the difficulties in getting the opportunity to carry through interviews at companies, and the choice of companies should therefore be a compromise of what is theoretically desirable and what is possible in practice.[10]

Due to the Department of Business Administration's non-existing budget for our bachelor thesis, we first decided to only investigate companies within Blekinge. But after having trouble finding interested and interesting companies within the region, we consulted our tutor, Wayne Strong. This meeting resulted in us realizing that if the quality of the thesis should be sufficient, thus finding suitable companies for our studies, we needed to set up our own budget for transportation costs. Telephone interviews were not an appropriate alternative since we had the opinion that they would create difficulties building a confidence between the respondent and us. Product Development is an area that could contain sensitive company information, and for that reason we decided to use face-to-face interviews that should give better opportunities to show our credibility. Lundahl and Skärvad emphasize that building a confidence is just as important as the technique used during the interview[11].

For time and cost reasons we decided to look for appropriate companies in southern Sweden. After several contacts with different companies such as Tetra Pak, Skånemejerier, and Unilever, we came in contact with the Findus Group in Bjuv, outside Helsingborg. Our contact was Findus' R & D manager for Europe. He gave us the opportunity to carry through interviews with key staff working with Findus' NPD process. Findus was an interesting company to investigate since they have respectable experience of product development. Their European R & D department is also located in Bjuv. C Technologies was another company that met our criteria's, and since they have changed strategy from marketing own products to developing products for other companies, they where a particularly interesting company to investigate. The Program Director for the area reading technology welcomed us for an interview with him at C Technologies' headquarters in Lund.

[10] Lundahl, U, p.192, 1999
[11] Lundahl, U, p.120, 1999

3.2.2. Preparing and Carrying Through Interviews

When we started preparing for the interviews we agreed upon creating an interview guide based on our theoretical background and purpose. The first interview guide contained a number of carefully formulated questions, specified for each respondent. Kvale supports this method as one of two ways of creating an interview guide. The other way is to approach the interview person with broader questions.[12] After seeking advice from Wayne Strong we changed the contents of our interview guide into broader questions. From his experience of interview situations he convinced us to start the interviews with broad questions and then narrow the questions into certain areas would be a better way to approach the interview persons, and at least give the same amount of information. The reason we first wanted specific questions was a consequence of our fear that wide questions would give us short and insufficient answers.

We prepared our respondents a couple of days before the actual interview by sending a brief e-mail, stating our purpose and what issues we wanted to discuss. This resulted, among other things, in us receiving documents helpful for our research.

The interviews at Findus were conducted on the same occasion on May 20th 2003, at Findus' headquarters in Bjuv. We interviewed the following key staff during the specified time:

Jan Blomberg, Head R & D, Europe	1,5 h
Mari Widov, Product Category Manager	1 h
Mattias Elholm, Nordic Brand Manager	1 h

To give the reader a better understanding of the respondents' position in the organization, we asked Mari Widov compile an organisation chart that we have drawn below.

[12] Kvale, S, p.121, 1997

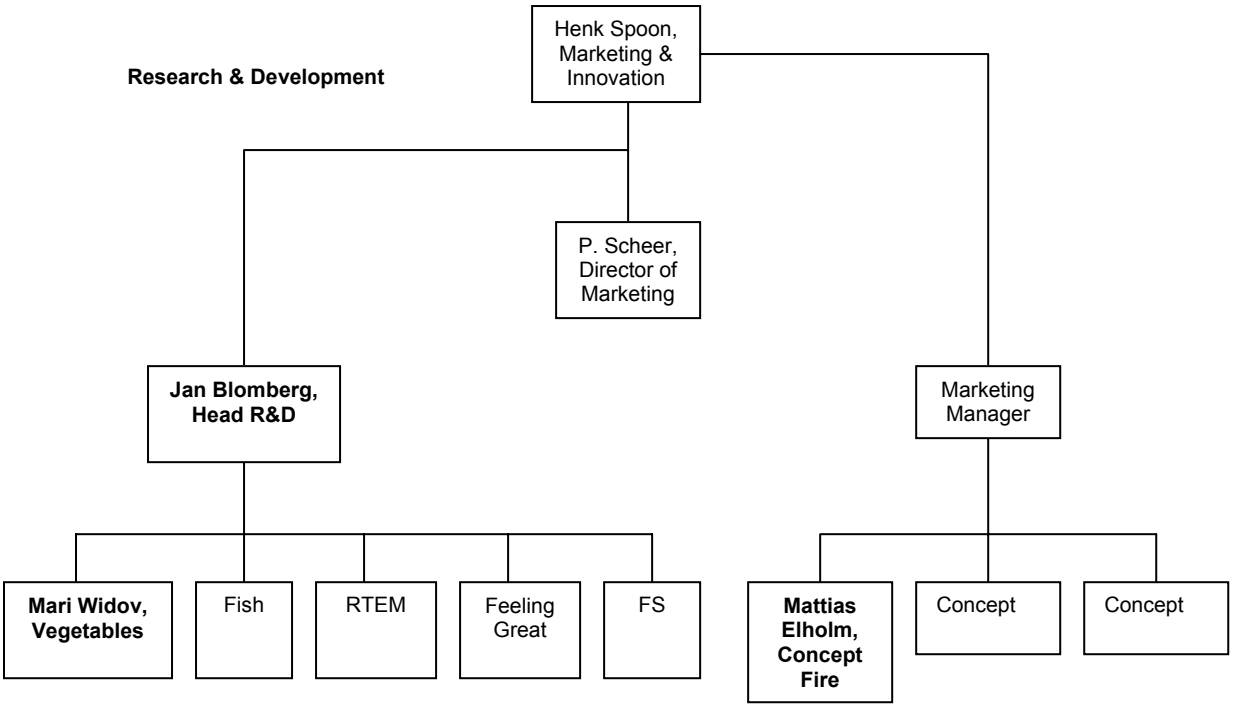

Figure 3. Organisation chart

Our last interview was realized on May 26th 2003 at C Technologies headquarters in Lund with Bengt Löfstedt, Program Director (Reading Technology). The interview lasted for one hour and a half.

All interviews progressed even better than expected and valuable information was gathered. We managed to build a confidence with the respondents, and guided the interviews within the borders of our thesis. Due to technical problems our planned use of a tape-recorder had to be cancelled and replaced by taking notes. On all interview occasions we got enough time to cover relevant questions. Both authors were present at all interviews.

3.2.3. Analysis & Conclusions

As soon as possible after the interview occasions we started to develop our notes from the interviews into a text that described the data in a better way. The empirical data has been put together in chapter 5, while analysis and conclusions are being handled separately in chapter 6. The Conclusions are based on the empirical data presented in chapter 5, and has been formed by an analytical model (presented in chapter 3.5.). In the conclusions we compare theories against

practice in the purpose of seeing new patterns, and creating new theories with existing theories as a reference.

3.3. Validity, Reliability, and Generalization

Validity could be explained as the absence of systematical errors in measuring data. The term is divided into both internal and external validity. Internal validity is when measuring instruments, such as in our case the interview guide, are measuring what they are supposed to measure. Lundahl and Skärvad points out the impossibility of achieving complete internal validity. It is although important with to understand and be aware of the fact that measuring instruments could measure too little, too much, or even measuring the wrong phenomena's. External validity is linked to problems as when the respondents don't remember things, remember the wrong things, don't know what to answer, or when they lie. [13] When preparing our interviews we discussed the problems with getting a high level of validity, together with our tutor, and we simulated a small-scale interview where he played the role as the respondent. This gave us the opportunity to reconsider some questions, and it was to a great help for strengthening our self-esteem before the actual interviews.

Reliability is defined as the absence of random measurement errors. An investigation with satisfactory reliability is characterized by the measurement not being affected by the person carrying out the measurement, or the occurring circumstances. Examples of circumstances are respondents, which are in a hurry, are not focused, or as in optimal conditions when the respondents can give answer to the interviewer's questions in a relaxed manner. Reliability is necessary to secure validity for the study.[14] We didn't take particular action to achieve a high level of reliability in our study. Even so the respondents seemed to give us accurate information. When asking the same questions to different people within Findus' organization we found that they had different perspectives on the same issue, which in fact gave as a more modulated picture.

Conclusions based on data gathered from case studies can normally not be generalized to accord for an entire population. However results from case studies can be used to create new theories, see new patterns, and using already existing theories as a reference for the empirical conclusions

[13] Lundahl, U, p.150-151, 1999
[14] Lundahl, U, p. 152, 1999

to be compared against. This is called analytical ability to generalize.[15] Our conclusions are therefore generalized in the analytical method described above.

[15] Lundahl, U, p.195, 1999

4. Theoretical Background

We have chosen to arrange the theoretical background in four major chapters, where every chapter aims to give the reader better opportunities for understanding the following chapter.

In chapter 4.1 we motivate the importance of successful new product development processes, and quantify the total cost for product development in the G5 countries. Chapter 4.2 is an introduction to definitions of new products, the market perspective of innovations and new products, and how companies can understand their customers. Chapter 4.3 has the purpose of explaining activities, which is a part of the new product development process. Finally in chapter 4.4 we describe the stage-gate process in detail. The stage-gate process is a cornerstone of our thesis, since it is the best model we have found for managing new product development. In the figure below we show the activities linked with the stages and gates in the model.

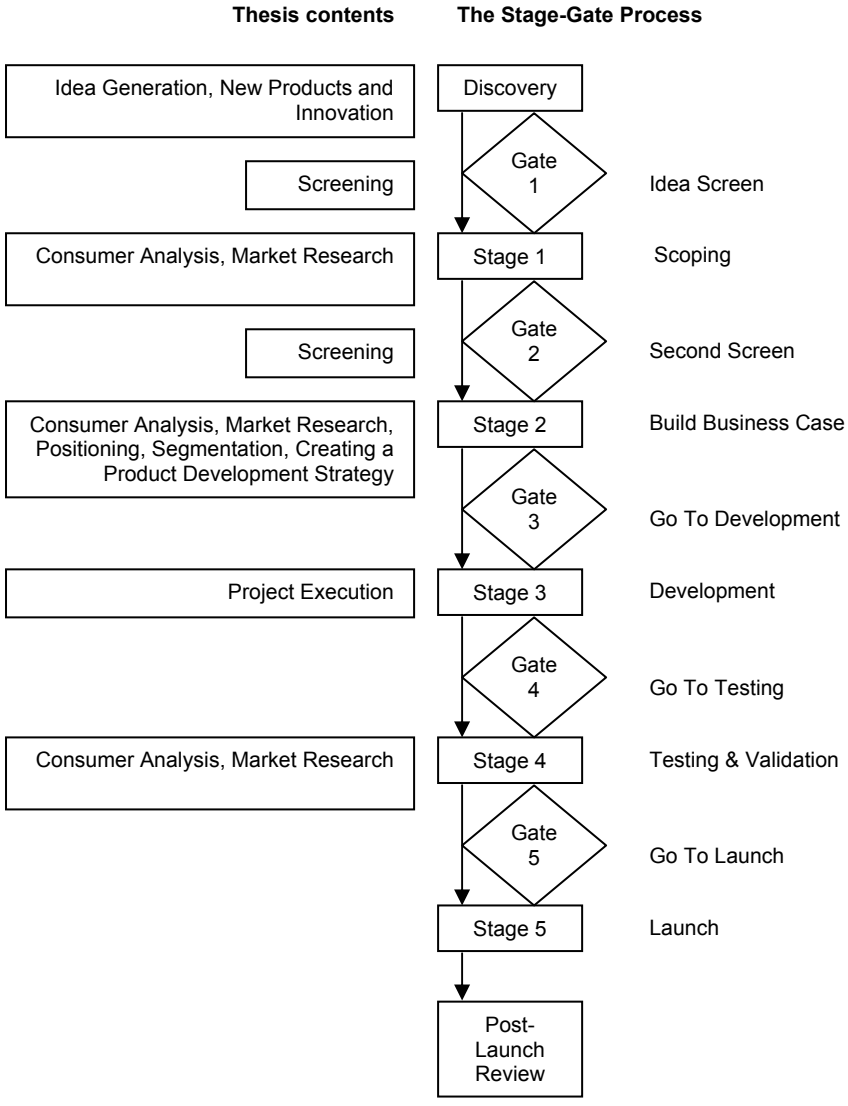

Figure 4. The Stage-gate™ product development process with thesis outline

Before choosing Cooper's stage-gate model as the base of our research, we evaluated other models, among them Kotler's new product development process. Kotler's model is not as sophisticated as Cooper's since it does not include evaluating gates. Cooper is also one of the most quoted authors in new product development articles.

We do not intend to investigate the launch-process since it mainly focuses on promotion activities. We are neither focusing on the production and its technical issues.

4.1. Why Reduced Failure Rates is an Imperative

The costs for product innovation are enormous. In the G5 (Japan, the US, the UK, Germany, and France) countries more money is spent on product innovation per day than was spent in the entire Gulf War in 1991.[16] To put this in perspective the final cost of the Gulf War was about $60 billion.[17]

Costs for R & D can be so high that a product launch delay or failure could destroy a company, regardless of the product's quality. Opportunity costs occur when a product launch is delayed as competitors can penetrate the market first. The importance of being first in a market sometimes makes companies launch products without sufficient testing. Product recalls can although be very expensive and harmful to the company's reputation. Since product life cycles are reducing in time, the need for product replacement's increases. To prevent the risk of being left without a new product to replace an existing one, companies can face higher costs as a result of the faster product life cycles. Product failure also effects company reputation, as customers and suppliers become more cautious in their attitude toward the company and their products. Naturally the trust in a company is reduced when they fail to deliver what you expect from them. Failure will also affect the financial markets, for companies listed on a stock exchange. Share-prices will fall and higher interest rates will be demanded from lenders, as compensation for the higher risk perceived.[18] All together these are aspects that highlight the importance of reducing new product failure rates.

[16] Cooper, R, p.1, 2001
[17] http://www.usatoday.com/news/washington/2003-01-15-war-cost-usat_x.htm, 2003-05-27
[18] Fletcher, K, p.208-209, 1995

4.2. Introduction to New Product Development

4.2.1. New Products and Innovation

Webster classifies innovation as better things to do, or a better ways to do things, in a manner that increases the chances of a company achieving its goals. To meet the criteria of innovation the actual change has to be very perceptible, and at the same time make a long-term effect on the company. Innovations could be both simple and complex solutions; in other terms it could be anything between changes in processes to entirely new products.[19] This classification shows us the strong bond between innovation and new products. The terms are nearly used as synonyms by both Hussey and Webster.

Innovation potentially contains high levels of risk-taking. Completely new products that are unknown to marketplaces have the largest risks, since they don't have an existing market. The uncertainty about the need and demand for the product makes it difficult for companies to develop the right products and succeed. The fax machine is a product that shows the complexity that companies face; the product was invented in the US but was never introduced, since market research did not show an interesting market for the product. Japanese companies launched the fax machine later on, when they saw a potential for the product. Companies do not only face the risk of failing with their product; they also risk the fact that their competitors might introduce a new and similar product to the market. Therefore, the importance of an effective and fast innovation process should not be underestimated. [20]

4.2.2. Innovation from a Market Perspective

Rogers describes a structure where innovation analysis is based on the user's point of view. The field of application is to predict adoption of the product in the future. According to Rogers an innovation could be characterized in five points. These are[21]:

1. Relative advantage
2. Compatibility
3. Complexity
4. Trialability
5. Observability

[19] Hussey, D, p.3, 1997
[20] Hussey, D, p.4, 1997
[21] Fletcher, K, p.201-202, 1995

The criteria *relative advantage* is at which level the product can be perceived as better than the product it is supposed to put back. Price, status and apprehended benefits are examples of advantages for a product in the marketplace. Rogers emphasizes the importance of the fact that relative advantage refers to advantages in the market and not advantages perceived by the manufacturer. Product oriented companies often introduce new products which they believe have a technological advantage, while the majority of the consumers often don't recognize the same technical benefits. It is therefore crucial to define a products relative advantage in a consumer perspective.

Compatibility refers to the extent of which the innovation is perceived to be reliable with current values, experiences and requirements of potential adopters. If an innovation should be successful it is crucial to be compatible with existing values in the consumers lifestyle, or when selling products to companies, compatible with other equipment.

Complexity is simply how difficult it is to use and understand the product.

Trialability aims to explain at which level a product could be tested and experimented with. Could the product be tested in small scale? Increased opportunities to try out and test the product will signify the chances of adoption among consumers.

Observability refers to the level of visibility of the new products that results from the innovation. In some industries visibility is extremely important, for example in the fashion industry where visibility often is the key to consumer adoption.[22]

4.2.3. Consumer Analysis

Consumer demand is basically similar to Kotler's definition of demands: "Demands are human wants that are backed up by buying power."[23]

Human wants and needs are created and formed by the culture surrounding an individual. Human needs are very basic, like food and shelter, while the wants are almost unlimited. Wants and needs do not become demands until they are backed up by the necessary buying power. Consumers are trying to find products that fit their requirements and give them most value and satisfaction for their money. Consumers usually find an abundance of products to cover their

[22] Fletcher, K, p.201-202, 1995
[23] Kotler, P, p.10, 1999

needs and they choose between different products based on the different values that these products will give them, namely customer value.[24]

Dubin gives an explanation to why consumers are prepared to pay higher prices for products with well-known brands than for unbranded alternatives. Insecurity about less known brands and their perceived quality makes consumers hesitate to buy those alternatives despite the price premium present. For the same reason branded products could be sold at a higher price. From the companies point of view a strong brand extends the opportunities to increased market share. Demand analysis is when comparing what price charged for the product with the actual brand, and the price consumers would pay without the brand. The difference is the value of the brand trademark.[25]

For long-term survival it is crucial for organisations to meet customer demands. Bergman defines customers as the most important group that organisations must create value for. He further discusses the customer concept, which basically relies on the fact that the consumers are the most important stakeholders for the organisation, since they are the reason to stay in business.[26]

Companies often fail to understand what the consumers want from a certain product, which directly can result in product failure.[27] Understanding how consumers use the product at different stages is one of the keys to success. Kotler refers to this as the buyer decision process for new products, and defines five stages in this process: awareness, interest, evaluation, trial, and adoption.[28] Gordon Oliver widens this process into eight stages: problem perception, awareness, comprehension, attitude, legitimation, trial, adoption, and dissonance.[29]

Depending on the nature of the product, the consumer spends a different amount of time at each of the stages in the model. This model is general and therefore it is not apply able to all product categories. For instance buying a chewing gum does not require the same decision process as buying a new stereo system.

[24] Kotler, P, p.10-11, 1999
[25] Dubin, J, p. 79, 1998
[26] Bergman, B, p.27, 2003
[27] Berggren, E, Feb 2000
[28] Kotler, P, p. 260, 1999
[29] Oliver, G, p. 67, 1995

After consumer purchases companies should make strong efforts to retain the customer and build a relationship that leads to repurchases. Oliver emphasizes the importance of customer retention, because retaining customers can be far less expensive than finding new ones. Loyal customers may also recommend the products to others.[30]

Consumers also differ in their willingness to adopt innovations. Rogers divides consumers into five groups depending on their acceptability towards innovations: innovators (2,5%), early adopters (13,5%), early majority (34%), late majority (34%) and laggards (16%). Initially the innovators are a very significant and important group. Innovators supply notions of what is fashionable and desirable.[31]

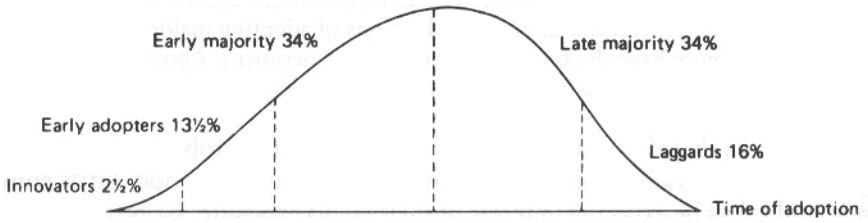

Figure 5. Adopter Categories by Time of Adoption

4.3. Activities during the NPD Process

4.3.1. Idea Generation

A new product can either be a solution to a discovered consumer problem or try to satisfy an already existing need[32]. Fletcher describes Say's Law, created by the well-known economist Jean-Baptiste Say (1767-1832), stating that the supply of a product can create its own demand. He gives a modern example with Sony's launch of their first portable TV, where all marketing research suggested there would not be a demand for the product. Despite the outcomes of the research the portable TV was such a great success that competitors started creating their own models. Thus, needs can be created and new industries can be formed.[33]

There are many different methods for finding new ideas. The most common methods and sources for new product idea generation are: Research & Development, (R&D) internal sales force, copying or learning from competitors, listening to customers, and continuously improving

[30] Oliver, G, p.10, 1995
[31] Oliver, G, p.69-70, 1995
[32] Oliver, G, p. 264-265, 1995
[33] Fletcher, K, p.40-41, 1995

strategies. A company can also appoint a creative group to develop new product development concepts.[34]

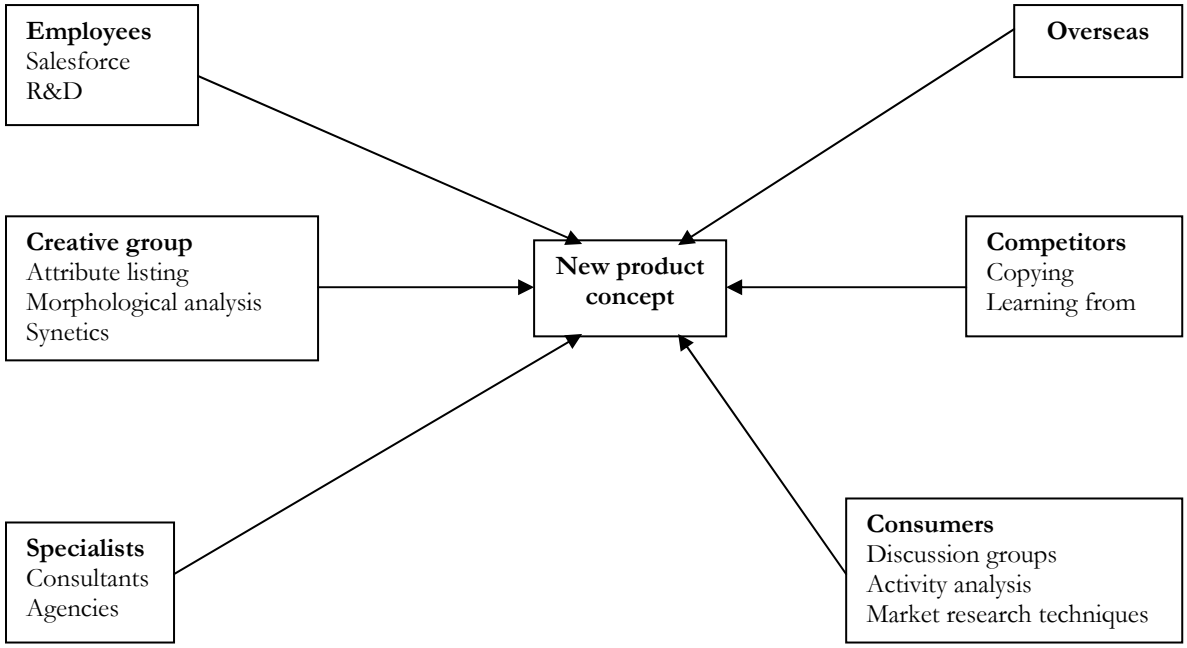

Figure 6. Generating concepts: sources and techniques

[34] Oliver, G, p. 264-267, 1995

4.3.2. Screening

After generating a large number of ideas a process of spotting the good ideas and dropping the bad begin.[35] The idea reducing or idea screening process has two essential features:[36]

1. Evaluation criteria's, list important factors for the future product.
2. Judge how each product meets the criteria's.

Kotler presents a model for a systematic idea screening process:

New-Product Success Factors	(A) Relative Importance	(B) Fit Between Product Idea and Company Capabilities	Idea Rating (A * B)
Company strategy and objectives	0.20	0.8	0.160
Marketing skills and experience	0.20	0.9	0.180
Financial resources	0.15	0.7	0.105
Channels of distribution	0.15	0.8	0.120
Production capabilities	0.10	0.8	0.080
Research and development	0.10	0.7	0.070
Purchasing and supplies	0.05	0.5	0.025
Total	1.00		0.740*
** = Rating scale: 0.00-0.40, poor; 0.50-0.75, good; 0.76-1.00. Minimum acceptance level: 0.70.*			

Figure 7. Screening Chart

There is no universal set of criteria's and this model is not designed to make decisions for company management, but has the purpose to assist the decision-making. [37] According to Oliver a planned and systematic approach in the screening process is wise and the criteria's should always be relative to the company's ultimate goals.[38]

Fletcher claims that screening is a stage where new product concepts should be eliminated (if they don't fulfil the necessary criteria's) before they create huge costs for the company. While new product concepts have a tendency of absorbing company management time and resources, it is sometimes crucial to break off new product development projects before it is to late. Fletcher also views the screening process as a possibility for improving and adjusting concepts to increase their chances of achievement.[39]

[35] Kotler, P, p. 611, 1999
[36] Oliver, G, p. 267, 1995
[37] Kotler, P, p. 612, 1999
[38] Oliver, G, p. 269, 1995
[39] Fletcher, K, p. 221, 1995

4.3.3. Marketing Research

Before introducing new products to the market companies usually have a large number of questions that needs to be answered. Marketing research is a method to give answers to these questions. The issues that companies want to find answers to can be very simple, for example if the consumers will like the new product, or more complex issues like how the consumers will react to a lower price. Marketing research provides companies with logical information to base their marketing plans on, and is for that reason an important tool.

Despite all the advantages of marketing research there are a number of pitfalls when dealing with this kind of research. Poorly formulated questions that are confusing the receiver, reactive errors, prestigious respondents, and interpretation mistakes are all examples of pitfalls that can jeopardize the reliability of the research.

The questions asked could be poorly formulated and therefore confuse the receiver, affect the answer, and the reliability of the research. Depending on which methods used for the actual research different difficulties might appear. Reactive errors can occur when the respondent feels special and selected and for that reason wants to make a good impression. The answers to the questions could contain a sense of prestige and the respondent could give answers that he thinks is socially accepted. Another common error in the field of marketing research is interview-included errors that occur since the social situation of an interview is unique. It is not in all cases that the view of the respondent is correctly rendered. A third common pitfall is interpretative errors, which could be described as errors caused by ambiguity in the questions.[40]

Data collection is essential to answer the questions raised by the company. The major data sources for market researchers are internal sources; including sales records, delivery and stock records, prices and quotations, sales promotion, advertising, reports from sales force, and past studies in marketing research. External data is divided in primary and secondary data. Primary data are surveys, consumer panels, experiments, and intelligence on competition. Secondary data are published information mainly consisted of statistics, for example from governments (family expenditure, national income etc.), trade association data, international statistics or data from other surveys.[41]

[40] Oliver, G, p.128-143, 1995
[41] Oliver, G, p.133, 1995

4.3.4. Positioning

Like Kotler, Trout defines positioning as the way you place a product in the mind of the receiver. Positioning is according to Trout a way to communicate in a society that is crowded with communicative messages and information.[42] Positioning is a method of communication, and is often related to one of the hardest areas to communicate within, namely advertising and commercials[43].

Trout further states that our society today is on the edge of becoming over communicated. In Sweden a regular consumer receives 3000 commercial messages on a normal day. All this communication leads to confusion rather than clarity. To reach and create a position in consumers' minds under these circumstances is what positioning is all about.[44]

By positioning products in detail, the new-product failure rates *can* be improved and thus create revenues for companies. Positioning is about understanding the customers and how to create more value for them.[45]

4.3.5. Segmentation

New products could easily fail if the company focus on the wrong segments of the market. Segmentation is about dividing the market into different groups with different wants, needs, characteristics or behaviour to find the consumer segments that value the new product the highest and serve that group's unique needs. After researching and evaluating the market, a company must find one or more segments to target and enter.

Markets consist of buyers that vary in many ways. They differ in attitudes, economic resources, wants, habits, locations and so on. In an ideal world each product would be designed for specific individuals. In many branches this is not a realistic scenario, but it does not often stop them from trying. Segmenting markets in different ways is an attempt to reach this ideal production in a broader way. The level of market segmentation can be divided into four major groups:[46]

[42] Ries, A, 1985, p. 10-13
[43] Ries, A, 1985, p. 9
[44] Trout, J, 1996, p.3-8
[45] Kotler, P, p. 443, 1999
[46] Kotler, P, p. 379, 1999

1. Mass marketing - When practicing mass marketing companies use almost the same product, promotion, and distribution for the whole market[47].

2. Micro marketing – Is about tailoring products and marketing efforts to suit specific individuals and locations[48].

3. Segment Marketing - Develop products that attract a special market segment[49].

4. Niche marketing – This pursuit is often an opportunity for smaller companies to compete on markets or segments that might be considered unimportant for large companies[50].

For a market segment to be effective it must fulfil the four requirements: measurability, accessibility, substantiality and actionability. One must be able to estimate the segments size, buying power and profits that can be generated in this segment. It must be easy to effectively reach and communicate to the segment. It must have a proper size that will generate enough profits, and one must be able to design effective marketing programmes for the chosen segment.

4.3.6. Creating a Product Development Strategy

Johnson characterizes product development as not only a survival tool for companies but also a great opportunity for success. Product development is essential for the overall strategy of a firm especially when the product has a short life cycle, as for technical products in the field of consumer electronics or software. Companies might face great challenges in developing new competences to maintain a high-level development of their products.[51]

New product development projects vary from small low-cost to revolutionary high-cost. By categorizing the projects, company management can get a better picture of the project portfolio and indicate what management efforts needed in the specific project. Product development projects are generally divided into four categories:[52]

1. Breakthroughs, mostly new projects involving new technology or processes. Can result in new product lines.

[47] Kotler, P, p. 380, 1999
[48] Kotler, P, p. 381-383, 1999
[49] Kotler, P, p. 380-381, 1999
[50] Kotler, P, p. 381, 1999
[51] Johnson, G, p. 368-369, 2002
[52] Wheelwright, S. C., 2001, p. 7-8

2. Platforms, the next generation of a product line.
3. Derivatives, adding new features to an existing platform or improving the manufacturing process.
4. Maintenance, improving existing features on an existing product or manufacturing process.

The size of the development portfolio depends on the firm's strategy but also on the firm's age. New companies tend to focus their development to one major project. This core product will be imperative for the survival of the new firm, but unfortunately all products have a limited lifecycle. By new product development and by improving existing products, the firm can survive and gain a stronger market position and a larger market share. Companies have limited resources and must therefore carefully choose projects that maximize the output from available resources. A planned approach that focuses on the business strategy can help product development to identify and define the most lucrative projects.[53]

Creating a prototype should be a part of a product development plan. A prototype represents a part of the product or the product as a whole. In either case prototypes are used to meet one or more of these goals:[54]

1. Test the feasibility of the product
2. Communicate with consumers and stakeholders
3. Communicate the idea to the company

According to Wheelwright prototyping is often an under-utilized tool in the product development process. He states that prototyping has an exceptional leverage in executing development projects and defines the prototyping process or cycle in three steps: design, build, and test (DBT). The DBT cycle can help companies to determine what design and features which will best meet consumer demands. In this way it can give companies a clearer picture of how to produce and deliver the product. The prototype is also an excellent tool for communication and evaluation that provides a reality check on the project status and indicates how well the project is fulfilling its objectives.[55]

[53] Wheelwright, S. C., 2001, p. 10-11
[54] Iansiti, M, 1996, p. 37
[55] Wheelwright, S. C., 2001, p. 19

4.3.7. Project Execution

One imperative for effective project execution is building a project team matched to the project type. Wheelwright divides project teams into four different types or categories:[56]

1. Functional – A traditional team structure where team members are in a subordinate position to the function head. The team is disbanded after the project is complete. This project type is effective when the project can be divided into functional units or if the project require deep technical knowledge.

2. Lightweight – This is the most common project form with a project manager that is responsible for the entire project. The project manager has little control over resources, deadlines and major decisions.

3. Heavyweight – A heavyweight project leader manages the project and team members report directly to the project leader. Team members are responsible for their various functions. The project leader is a 'heavyweight' in the company with influences over resources, decisions, and goals

.

4. Autonomous – This is the most entrepreneurial type of these four project types. It is designed to handle challenging development projects whose parameters are difficult to define and no matter what deliver the wanted results. The team has a lot of influence on resources and operating procedures.

When choosing team types companies have to consider their strategic direction and current project portfolio. Companies usually have a dominant development focus, for example 60% breakthrough projects, and have therefore an associated dominant project type, in this case probably the autonomous project type.[57]

Effective communications is imperative for both the team and company management to be able to track and monitor the project progress. Dividing the project into phases and milestones can be very useful and give the status of key aspects of the project.[58]

[56] Wheelwright, S. C., 2001, p. 15
[57] Wheelwright, S. C., 2001, p. 16-17
[58] Wheelwright, S. C., 2001, p. 18

4.4. The Stage-Gate Process

Cooper is the creator of the Stage-gate™ process, which is a blueprint for managing new product development. Cooper's research, presented in his book "Winning at New Products" has influenced global companies such as Procter & Gamble, DuPont, and Nortel Networks to approach a stage-gate oriented product development process.[59] The model has the purpose of making the innovation process effective. The process is built around stages and gates. The stages are intended to gather information necessary for transferring the project into the next gate. Each stage encloses a number of activities that people from different parts of the organisation needs to undertake. These activities have the purpose of gathering information and reduce uncertainty. As an idea or innovation passes further on in the process the costs are higher than in the previous stage.

The gates have the function of a quality control. A new product must meet certain criteria's to be approved for further development in the next stage. The criteria's could be measured against a checklist which is designed to filter projects that are less likely to fit with the firms overall strategy. Examples of checklist issues are if the project fits the business strategy or if it meets environmental, health and safety policies of the firm. The degree of product advantage could be evaluated. An important question is if the product has the qualifications that contain the company's core competence. Market attractiveness is also under consideration. The gates do also have the function of an action plan for the next stage, including requirements, time planning and a date for the next gate.[60]

[59] Cooper, R, preface, 2001
[60] Cooper, R, p.130-132, 2001

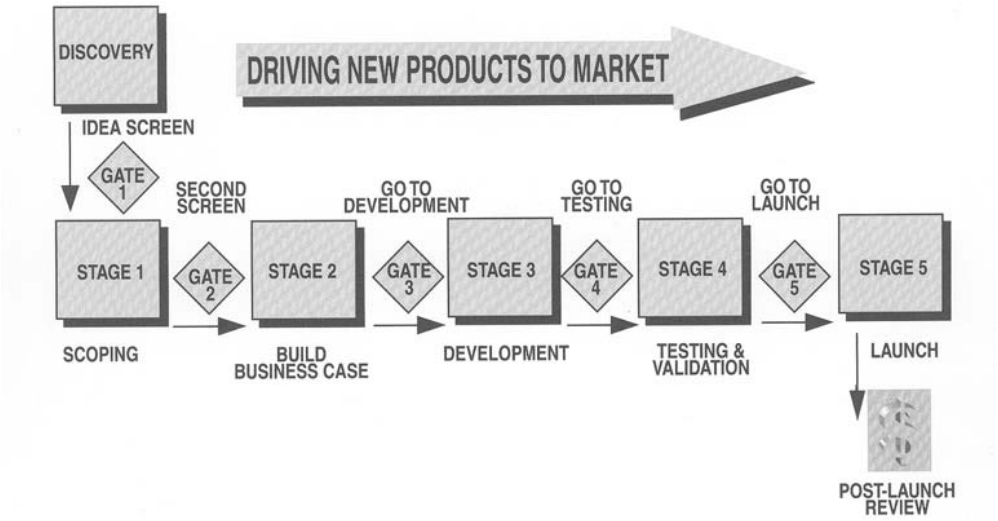

Figure 8. The Stage-gate™ product development process

Discovery

The first step in the Stage-gate™ process is discovery. Ideas are essentially the base for new product development, but are on the other hand no guarantee for new product success. In broad outlines the discovery stage could be distinguished as preparing work with the purpose of discovering opportunities and ideas.

Gate 1: Idea Screen

The first gate is where the decision is made whether the project should get resources to be sent further in the process. Gate 1 is a soft screening process. The criteria's that the product needs to meet are for example issues concerning product advantage, degree of opportunities, market attractiveness, and ability to fit with the company policies and product lines. If company management decides to commit to the project, the project moves into the stage of further investigation namely the Scoping stage.

Stage 1: Scoping

The overall purpose with the scoping stage is to determine the project's merits, both technical and market aspects. It is mainly desk research serving as a preliminary investigation, and is about "doing your homework". Methods used at this stage could be Internet search, library search, focus groups, contacts with key users, and perhaps even a small-scale concept test with potential users. The reason is to gather market intelligence, like market size, potential, and forming the concept around the product. Technical estimations should also be looked into at this level, for instance around technical and manufacturing processes. Time, costs, other risks and roadblocks

should preferably be judged and measured to allocate the right resources for the project. Scoping is often done in less than one month's time, and is an inexpensive stage in the product development process.

Gate 2: Second Screen

The second screening process is obviously more rigorous than gate number 1. The methods are the same as in gate 1, but the new information from the scoping stage are basic data for decision-making. If the project passes this filter it moves into a stage containing higher costs.

Stage 2: Building the Business Case

Building the business case comprise more detailed research, concerning both market- and technical factors. A project plan is set up, the product is defined and validated. This is the stage where companies must do their homework. Poor Market Research could otherwise lead to devastating results. Market investigation with the purpose of settle customer needs, wants, and preferences are crucial at this stage. Competitor analysis is also an important element at stage 2. Consumer needs and wants also need to be transmitted into technical and economic solutions that is feasible. Stage 2 requires appreciable greater resources than stage 1. Stage 2 is therefore preferable to be handled by a project team consisting of members with different functions in the organisation.

Gate 3: Go to development

This is the last gate before the product moves into the development stage, and is therefore the last stage to quit the project before the costs become too high. The methods in this gate are financial analysis, review of the activities in stage 2, and make sure that results are positive. Criteria's that the project was supposed to meet at gate 2 are once again reconsidered.

Stage 3: Development

The focus at this stage is on technical work including lab and in-house tests with the ambition to make sure that the product fulfils the requirements. Potential results from the technical work are for example prototypes or models. Marketing activities as market-analysis and customer feedback are also undertaken parallel to the technical development. The implementation of the development plan takes place at this stage. The financial analysis is updated, and patent and legal issues are investigated.

Gate 4: Go to testing

Gate 4 is a checkpoint for the previous development work, where the quality and consistent with the original definition of the product is monitored. This stage of the new product development process has the overall function of measuring the attractiveness of the product and the project. More accurate data are put in to the financial analysis.

Stage 4: Testing and Validation

Stage 4 tests and validates the product, the production process, customer acceptance, and the projects financial situation. The stage encloses a great number of activities as; in-house product tests, user or field tests of the product, pilot or limited production, market pre-tests, test marketing, or even trial sell. Once again the project's financial analysis is updated with new and accurate data.

Gate 5: Go to launch

Once the project has passed gate 5 it moves into full commercialisation, and for that reason it is the last chance to abrupt the project. This gate focuses on the quality of the results in the testing and validation stage. The criteria's that the project needs to accomplish is mainly focused on financial return. Marketing plans are reviewed and accepted for implementation in stage 5.

Stage 5: Launch

At this stage of the process, the product is commercialised and operations as marketing and sales are fully developed. The launch-stage is mainly about implementing the marketing launch plan and the plans for operation and production. With the right resources and with exception from unexpected incidents the chances of new product success should be great.[61]

[61] Cooper, R, p.130-141, 2001

5. Empirical Analysis

5.1. The Findus Group

5.1.1. Company Background

Findus was founded in 1941 when Marabou acquired a small fruit company in Bjuv, near Helsingborg, Sweden. The name Findus has its origin in *FruitINDUStry*. Findus revolutionized the Swedish food market when introducing the first frozen food products in the country in 1945. Nestle, the worlds largest provision manufacturer, acquired Findus in 1962 and the Findus Group was part of the Nestlé Group until February 1st, 2000.[62] The Findus Group is now owned by EQT, a private equity group in Northern Europe.

The core competence in Findus is around frozen food, which is the major part of the company's sales. The products range from Ready To Eat Meals, (RTEM) to Fish, and stir-fry vegetables. Examples of Findus products are frozen vegetables of various kinds, fish fingers, and ready-cooked (convenience) food, but Findus also manufactures culinary products such as marmalade, mayonnaise, meat sauce, soup, and pasta sauce. Findus has a broad concept portfolio including for example Wok, Findus Feeling Great, and Findus Fire, which is a concept of Ready To Eat Meals with the difference of containing more spices and taste.

The headquarters are located in Bjuv, where a major production facility is located. Production and Sales are located in: Sweden, Norway, UK, France, Spain and Thailand. The Findus group also have sales companies in Finland, Denmark, Germany, Hungary, Czech Republic, Slovakia, and Australia. In Iceland, Ireland, Portugal, Belgium, Austria, Malta, and in Cyprus, the company sell their products through agents.

The Findus Group has a total number of 3000 employees, and in 2002 the company had a turnover of € 626 millions. The Swedish market is naturally the most important one, as Findus has over 60 years experience of food production in Sweden. Half of the Findus Group's sales take place in the Swedish market. Most of the products are sold in grocery stores, but food for restaurants, schools, and hospitals are also produced for the Swedish market.

[62] Facts about Findus, Information Brochure, 2003

Findus has a leading position in the Swedish frozen-food industry, and has the vision to become a leading frozen food company in Europe. They aim to be known for their high quality products that will improve people's quality of life.[63]

In 2000 Findus' result was charged with restructure costs of around 1 billion SEK due to the shift in ownership[64]. The result for 2000 was a loss of approximately 1,15 billion SEK[65]. In 2001 the result was improved but the loss still reached 300 million SEK. The tough times for Findus might continue since everyday commodity companies, such as ICA, Coop, and Axfood are introducing their own brands and in that way are competing with Findus' products. In England and Germany the stores' own brands are already accounting for a third of the market.[66]

5.1.2. The NPD Process

Before Nestlé sold the Findus Group to EQT in 2000, new product development was divided into the three different departments; marketing, R & D, and sales, with marginal co-operation. Today Findus approach new product development in a project-oriented manner. The project teams consist of people from all involved departments. The R & D department obviously play an important role, but marketing, sales, and production departments are also involved in the new product development process.

Findus has developed a formal process for new product development. The model has the same structure and the evaluating characteristics as Cooper's stage-gate model, but Findus R & D department has independently developed their model.

[63] Facts about Findus, Information Brochure, 2003
[64] http://skolan.presstext.prb.se/bin/neta2gate?f=doc&state=8qbc1m.9.4, 2003-05-28
[65] AffärsData, 2003-05-28
[66] http://skolan.presstext.prb.se/bin/neta2gate?f=doc&state=8qbc1m.9.4, 2003-05-28

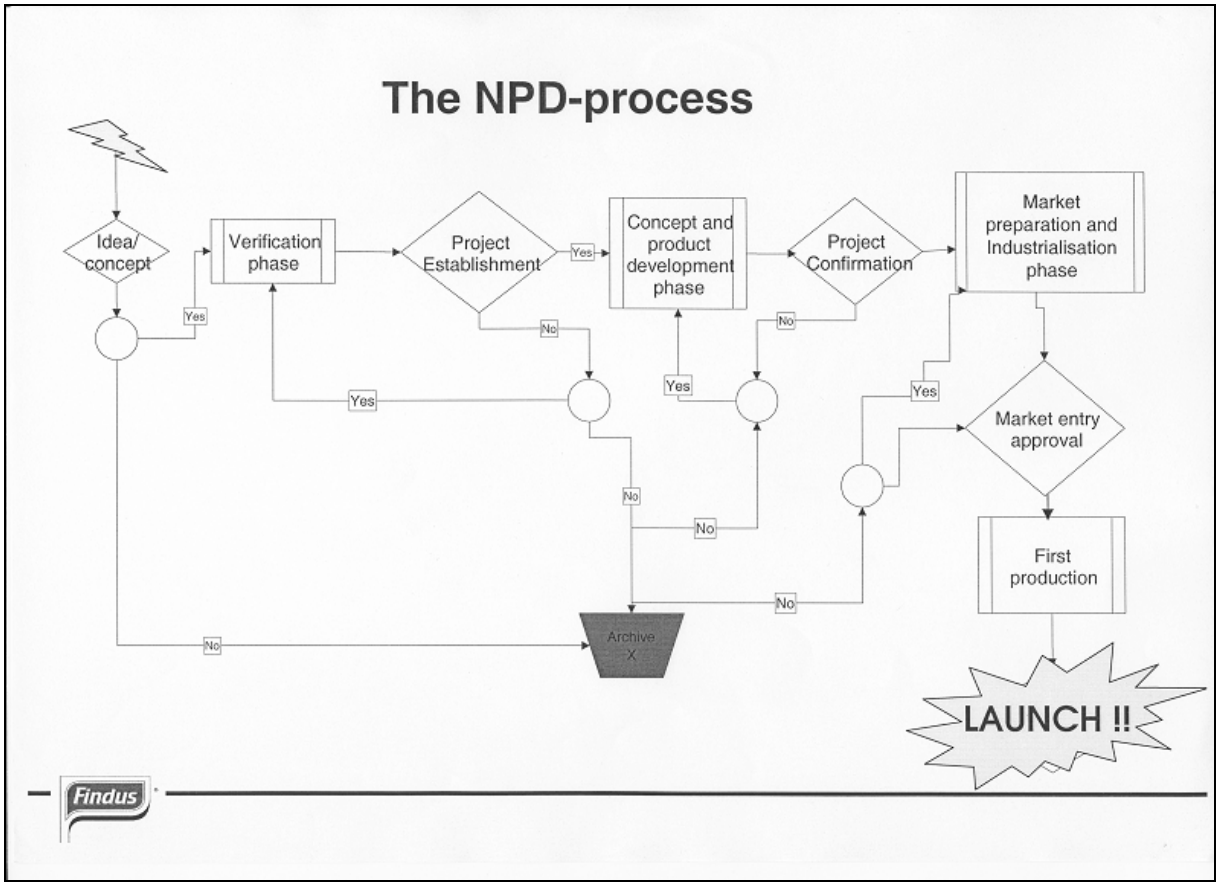

Figure 9. Findus' NPD process

Findus' *idea/concept* and *verification phase* is comparable to the stage-gate model's idea generation and screening. The idea generation for Findus' new product development originally derives from consumer needs and wants, but Findus is also trying to create consumer wants. They monitor trends in cooking and lifestyle through magazines, TV, and restaurants. These activities are done both internally and through external consulting firms. The purpose of monitoring trends is to find new ideas and concepts that will fit the consumers of today and tomorrow. According to Product Category Manager Mari Widov consumers turn to Findus' customer service with complaints and suggestions on product improvements. For that reason she emphasizes that Findus' customer service is an important source for product improvements and new ideas. At the *idea concept* and *verification phase* internal focus groups is a method for discussing new ideas and their compatibility with the company's overall strategy. Twice a year a meeting is arranged to discuss the company's products, including new concepts and ideas.

Before reaching the *verification phase* all ideas are carefully formatted in a standardized document, which is handed over to R & D Management that evaluates the ideas. Oliver and Kotler

recommend this systematic approach where each and every idea must be presented in a standardized document. Jan Blomberg, Head R & D, states that if an idea should pass through the screening process it must meet the following criterions at an early stage:

- Strategic correlation – the product must fit with the company's strategic focus
- Product potential
- Economic potential

Further Blomberg pointed out the importance of rigorous investigations to define the product as soon as possible in the new product development process. This will save both time and energy and help the company to focus on realistic projects.

After the idea has been approved for further development, a project and its team is established. The team is built with people from different departments with complementary competences. Nordic Brand Manager, Mattias Elholm, emphasized the significance of bringing in the right people at the right time to the project. Commitment, balance, and positive personal chemistry amongst the project members are very important issues according to the respondents at Findus.

The *concept and product development phase* is a phase where the actual product development and market validation takes place. Product tests are made with customers and none-customers. Findus use their database containing 2400 customers in Sweden, as a tool to evaluate the market potential of a new product. The database is used for home samples, focus groups, and discussions about the products. Marketing Research is also undertaken in this phase, often performed by marketing agencies and consultants. This phase is comparable with the stage-gate models development stage (stage 3), but it has also similarities with the models testing and validation stage (stage 4).

After the concept and product development phase the project is evaluated in the project confirmation phase. Mattias Elholm considers project confirmation to be the most important phase since it is the last step before the actual production takes place. He considers it to be the last chance of breaking off the project, before it goes into production and launch activities.

The final phases from market preparation to launch is similar to the stage-gate model's launch (stage 5).

5.1.3. Key Success Factors

One of our broad themes during all interviews was to let the respondent define the Key Success Factors for the company's product development. Naturally the answers were different depending the respondents different perspectives and positions within the organization, but there are also some frequent common elements. Jan Blomberg, Head R & D, pointed out Findus' Key Success Factors as:

- Product acceptance in the market
- Working with the right ideas
- Personal commitment
- Well-known and well-accepted NPD process within the company
- Invest a lot of energy in the beginning of the project to define the product or concept

The Idea Concept and Verification phase is the tool for selecting the right ideas, and defining the product or concept. With the expression well-known and well-accepted NPD process Blomberg refers to that the organization must provide the staff with time and resources to work with the different phases in the NPD processes.

He further characterizes an optimal product launch with the following attributes; increased Net Sales, increased corporate image, and an economic surplus that fulfils or exceeds the ambitions.

Mari Widov, product category manager, summarizes the main key success factors as parameters in a trinity. The key to success is a combine of successful R & D, Marketing on European level and local marketing efforts.

Besides from the main success factors, she point at other aspects of a successful product development process. These points are among others concerning personnel issues as having committed team members in the project, having a positive personal chemistry in the project team, and that decisions are made and are being respected by everyone. " A termination of a project must be accepted by everyone." She also discusses the importance of key staff attending to important meetings so that decision could be made when it is necessary. Finally Widov accentuate the fact that the project members must learn from other projects, thus creating a learning cycle.

Mattias Elholm, Nordic Brand Manager, emphasizes the significance of timing and balance in the project team. He also has the opinion that the company is focusing more on problems than on opportunities when handling new ideas, meaning than Findus have a high awareness of what they are good at producing and that new products should be around this competence.

Findus' failure rates are naturally a sensitive subject, and for that reason Jan Blomberg would not like to mention an exact number. He ensured to us that the failure rates were below 80-95%. Mattias Elholm discussed the problems with high failure rates more openly, and quantified product failure rates to be in line with the 80-95% we mentioned.

5.2. C Technologies

5.2.1. Company Background

"C Technologies is a high-tech development company with mobile solutions that connect printed text to the digital world."[67] The company is specialized in developing products that read, process and store text and pictures. The company is most known for their C-Pen, which is the only product that is sold as a consumer product. C Technologies is a subsidiary to the Anoto Group with a total turnover of approximately € 24 million (220 MSEK). C Technologies stands for just about 78 % of the turnover. The Anoto Group is listed on the Stockholm Stock-exchange. The other subsidiaries in the combine are Anoto AB and WeSpot AB. Anoto AB is simply expressed focusing on putting digital communication into pen and paper. WeSpot's core activity is intelligent camera systems, as for smart door openers or face recognition. The founder of all Anoto-companies is the entrepreneur Christer Fåhreus, who is also a main shareholder in Anoto with 4,7% of share capital. Other major shareholders are Ericsson (23,5 %), and Capital Group with 12 % of the share capital.[68]

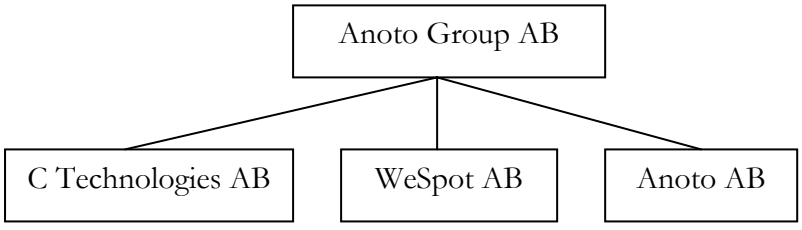

Figure 10. Organisation Chart, Anoto Group

The Anoto Group and its subsidiaries have their headquarters in the same building at Ideon Research Park in Lund.

[67] http://www.anotogroup.com/navigate.asp?PageID=51, 2003-05-27
[68] http://www.anoto.com, 2003-05-27

In 2000, C Technologies changed strategy from mainly developing own products to developing products together with partners. Today, approximately 90 % of C Technologies development is done together with partners and external customers. C Technologies trust in partnerships and does not position it self as a company developing consumer products. Bengt Löfstedt says that "we are too small to market ourselves towards the end consumers" and point out that "it is much more expensive to build a brand than a product".

The subsidiaries in Anoto Group AB are very creative and the group as a whole is the fourth largest patent seeking company in Sweden with over 580 patent requests and 62 approved patents.

5.2.2. C Pen

C Pen is the only consumer product that C Technologies has developed and marketed themselves. C Pen reads, stores and, processes text material that can be sent to a PC, e-mailed, faxed, or sent via SMS. The C Pen can also translate scanned text and read bar codes. When C Pen was introduced in 1998-1999 it drew an enormous attention and created a stir on exhibitions such as CeBit and Comdex. The potential in C Pen was at that time seen as nearly unlimited. Even though C Pen did not sell in the expected volumes, Bengt Löfstedt regards it as a successful product. Despite regarding the C Pen as a successful product he let us know that the complexity of the product has been a problem. He has the opinion that the engineers at C Technologies sometimes make such advanced solutions that consumers cannot apprehend. The latest version of the C Pen is also more consumer/user-oriented. He further emphasize that C Technologies has become a more end consumer oriented company. The end consumer perspective is of high priority, even when developing products to other companies.

5.2.3. The NPD Process

The NPD process follows a specified model, but C Technologies are very flexible towards the partner, which they are developing the product for. The partner, who for example could be SonyEricsson or Nokia are continuously updating their specification of requirements. Bengt Löfstedt defines a successful product development as when the customer is satisfied with the product.

New product ideas come from both internal and external sources. Ideas that derive from internal sources are always developed together with a partner since C Technologies does not undertake a

product development project without a partner. Ideas from external sources are ideas and concepts from partners and customers. The management encourages internal idea generation, since each employee has a certain amount of reserved time for thinking and idea generation. Bengt Löfstedt tells us; "that many ideas have come up during the coffee breaks". Oliver emphasizes that the most common methods for idea generation are through R & D and listening to customers, which is exactly what applies for C Technologies.

C Technologies NPD process contains two screening gates, which is familiar from the stage-gate model. To pass the first gate the pre pilot study must show a positive sales forecast and a pre pilot study is carried out. It also depends on the ongoing projects, and their current development situation. If the results are not satisfying, the idea will end up in the trash can. Before the year 2000, most ideas slipped through the screening gates and prototypes were directly developed without worrying too much about the market potential of the product. Today, only if an idea is genuine and the prospects are promising, resources are allocated to expand the pre pilot study to a full-scale pilot study. If the pilot study shows that it is the technically possible for the company to develop the product, more resources are allocated and a project team is formed. After this last stage almost all ideas become products and there are no more official screening gates involved in the process. Thus, the idea goes from project to product and maintenance.

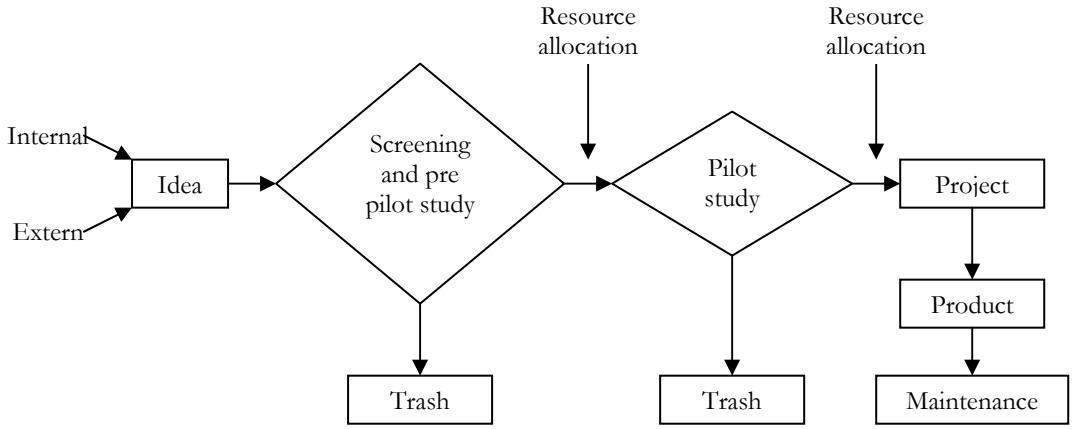

Figure 11. C Technologies' NPD process

The two screening stages in C Technologies' NPD process, *screening and pre pilot study*, and *pilot study* are equivalent to the State-gate models idea screen (Gate 1) and second screen (Gate 2). But the *pilot study* stage is not only a screening stage, since it includes marketing research, segmentation, positioning, understanding whom the customers are, and how they are thinking.

Project teams are consisting of specialized individuals with the competences necessary for developing the idea further. Most of the team members are from the R & D department, but marketers are also part of the NPD-projects. Bengt Löfstedt tells us about the traditional conflict between marketers, business economists, and engineers. This conflict is based on the different time perceptions that these people have. "Marketers tend to focus on seeing results within weeks, business economists are focused on the quarter-reports, and engineers needs one year to develop a product. This different time perspectives could at some occasions be a problem in the product development process.

5.2.4. Key Success Factors

Bengt Löfstedt identifies four key success factors for C Technologies' NPD process:

1. A willingness to change
2. Sensitiveness of hearing
3. Flexibility towards customers and market
4. Experimental environment

All together the key success factors and the NPD processes includes what C Technologies find most important when developing new products. The key success factors are although not concerning a single phase of the NPD process. Key success factors 1, 2, and 3 are all about flexibility towards the partner (who is the customer). C Technologies' key success factors are based on the people in the project teams. As a result of the partnership strategy and their clear focus on product development, Bengt Löfstedt claims that almost all of their products are successful. This statement is difficult to interpret since he is the only person we interviewed at C Technologies. It is possible that if we have had more interviews within the organization the definitions of successful products might have differed.

6. Conclusions

Both Findus and C Technologies are using NPD-models that are simple and evaluating. They have the ambition to sort out bad ideas at an early stage, and as soon as possible start working with the "right" ideas. Their NPD processes contain the activities considered as important in theory, such as screening and market evaluation. Despite the high awareness of methods, techniques, and theories more than 70 % of Findus' new products fail. C Technologies does not seem to fail in the same extent as Findus. We believe that the main reason for the differences in failure rates is a result of C Technologies' partnership strategy. We emphasize that Findus and C Technologies are two companies with very different business strategies. Findus develop, produce, and market their products, while C Technologies only develop products and a partner markets and promotes the product.

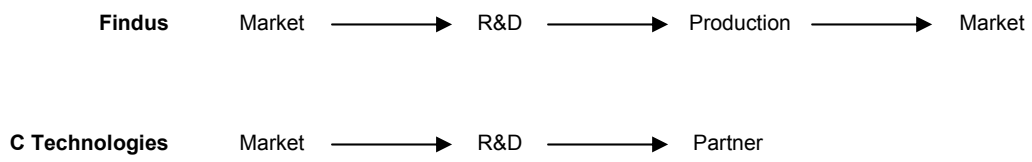

Figure 12. Steps to market

Findus has a much longer process for getting their product to the market and therefore also more obstacles and difficulties might appear along the process.

The NPD processes that we studied at Findus and C Technologies are both in line with the thoughts behind Cooper's stage-gate model. They have ambitious recurring screening processes that evaluate new products' strategic correlation and market potential. Since both companies have similar NPD processes, which are in line with the stage-gate model, and since the companies seem to have totally different failure rates, we cannot draw too many conclusions of what product development processes a company should consider when developing a new product to reduce the risk of failure. The failure rates for Findus and C Technologies cannot be explained by studying their NPD process's alone. We consider Findus' failure rates as not only being a result of internal factors, but also external factors such as extended competition. This aspect was not investigated during our thesis, but with a starting point from the empirical data gathered we cannot ignore this fact. Findus have experienced an increased competition where their own customers such as ICA and Coop are developing and producing competing products.

However we can draw conclusions from Findus' and C Technologies' key success factors in product development. Neither Findus nor C Technologies mention a single stage or process as a key success factor. The key success factors that they do mention are concerning personal commitment, development flexibility, and listening to the market. The NPD processes itself as a process does not seem to be causing any major concerns, instead Findus and C Technologies seems to be struggling with how the project team is handling each activity and its outcome in NPD process.

Despite the difficulties drawing conclusions from our work, we have the opinion that a formal NPD process with stages and gates is imperative in reducing new product failure rates. We also believe that creating a learning cycle to avoid making the same mistakes over and over again can reduce the failure rates. Our final conclusion is that product development should rely on consumer wants and needs; thus, the market should direct the product development.

6.1. Further research

New Product development could be analyzed from a huge amount of angles. For that reason this thesis has opened a number of doors to further research. Further research could focus on:

- Idea generation – Which idea generation techniques result in successful product ideas?
- Screening – How can companies effectively separate bad ideas from good ones?
- Building realistic business cases – How can we build realistic business cases?
- Marketing activities – How can better understanding of the market reduce new product failure rates?
- Launch activities – How does product launch activities correlate with new product failure?
- Learning – How can companies learn from their product development failures?
- Value chain analysis – Is there any relation between the value chain and new product failure rates?

To summarize it is almost impossible to write one thesis that regards all aspects of new product development and the causes for new product failure, which probably is the reason as to why the last 40 years research have not resulted in lower failure rates. Through this work we have learned about the complexity involved in developing successful products.

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7.4. Figures

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Figure 2. Thesis Process, Behrens & Waldemarsson, 2003

Figure 3. Organisation chart, Widov, Mari, Product Category Manager, Findus, 2003

Figure 4. The Stage-gate™ product development process with thesis outline, Cooper, R, p.130, 2001

Figure 5. Adopter Categories by Time of Adoption, Oliver, G, p.69, 1995

Figure 6. Generating concepts: sources and techniques, Oliver, G, p.265, 1995

Figure 7. Screening Chart, Kotler, P, p. 612, 1999

Figure 8. The Stage-Gate™ Product Development Process**,** Cooper, R, p.130, 2001

Figure 9. Findus' NPD process, 2003

Figure 10. Organisation Chart, Anoto Group, 2003

Figure 11. C Technologies' NPD process, Löfstedt, Bengt, Program Director, C Technologies, 2003

Figure 12. Steps to market, Behrens & Waldemarsson, 2003

8. Appendix

8.1. E-mail from Berggren, Eric

RE: Regarding your article: Why good ideas go bust

Jacob & Marcus,

Some companies are good at production innovation and others are good at product commercialization. For example, 3M is known for it's product innovation, but they often have trouble capitalizing on that innovation in the market place.

We were referring to the other group of companies who may not have as much of a flow of innovative new products, but they have more success with the new products that they do have. These companies include Procter & Gamble, Exxon Chemical, Guinness, Hewlett Packard, IBM, and VISA. One common element to these firms is that they have a formal stage-gate process for new product development.

I hope this helps your research.

Best regards,

Eric

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