MASTER

Implementing portfolio management
a step-by-step guide

Vergeer, E.L.M.

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Implementing portfolio management: a step-by-step guide

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In partial fulfilment of the requirements for the degree of

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Preface

In 2008 I went from a country girl to a university student in ‘big city’ Eindhoven. My bachelor at Industrial Design has been a creative journey, and my master at Innovation Management has complemented this journey with a more theoretical approach on business. My university learnings all come together in this final master thesis which marks the end of my time as a university student in Eindhoven. Next to academic knowledge, my years in Eindhoven have made me wiser in many different ways. I would therefore like to use this preface to look back on some lessons that I’ve learned in the past 5,5 years ------>

Additionally, I would like to express my gratitude to some people who have made this research project possible.

First of all, I would like to thank Gerben, my company supervisor. He has made it possible for me to graduate on a challenging assignment at company A, and has always made time to discuss my progress. His input has helped me to learn a lot from daily business practices and enabled the creation of a personalised research result. Additionally, I would like to thank the management and employees of company A for receiving me with open arms and thinking along with my project. You have facilitated my graduation project and made me have a pleasant time at company A.

Second of all, I would like to thank my university supervisors, prof. dr. Fred Langerak and Dr. Katrin Eling, who have guided me through the research process, and gave the necessary guidance. Before the start of this research project, Fred Langerak told me; It is your project, your journey, and I will not lead the way because I like independent students. By saying this, he has been of more help then he might realise. Going through the process while being forced to choose my own directions and make my own decisions has helped me to gain confidence in my own capabilities. His feedback and redirections have taught me a lot and helped me to take this project to a higher level.

Finally, I would like to thank my family and friends. My parents gave me the chance to study and have supported me in any decisions I made both in my studies and outside my studies. For this, I am indescribably thankful. Also I would like to thank my sisters. Not only did you listen to my occasional whining, you also cheered me up and were of big support. I was very lucky to have you so nearby during my time in Eindhoven. My friends have given me the necessary distraction and made me fully enjoy my free time. Last but not least I want to thank Leo, who has given me both calmth and courage, and who has loved me at times that I wasn’t too lovable.

Elien Vergeer

Eindhoven, April 2014
Management summary

The subject of this master thesis graduation project is Product Portfolio Management, which can be defined as “the set of activities that allows a firm to select, develop and commercialize a range of new products that will enable the firm to grow profitably over the long term” (Kester, Griffin, Hultink, & Lauche, 2011, p. 641).

The research is performed at a large Fast Moving Consumer Goods producer, and is focused on the successful implementation of portfolio management at this company (company A). The project was a design-focused and theory-based case study with two objectives: 1) To increase the managerial impact of portfolio management by developing a framework for portfolio management which takes the daily practice of portfolio decision making into account. 2) To create a step-by-step guide that enables proficient implementation of the new framework at company A. The first objective will be achieved by means of a theoretical review, whereas the second objective will we accomplished through an empirical analysis at company A.

Introduction

The segment of the Dutch food market that company A operates in, is currently a difficult market for various reasons. There exists a structural overcapacity for production, Private Label products represent a large and growing share of sales, raw material prices are rising considerably. Major retailers, such as Albert Heijn, SuperUnie and Jumbo, are so influential in the product distribution that they exert pressure on the profit margins of their dependent producers.

Given these conditions influencing the market, focus is largely on delivering value to the shareholders and doing more with less. This asks for effective and efficient investment of resources, and puts strain on selecting the right projects to add winning new products to the product portfolio.

Literature independently describes portfolio management tools that can be used to launch winning new products, but the lack of (proficient) portfolio management within organizations shows a discrepancy between theory and practice (Shane & Ulrich, 2004). Insights that resolve the challenges of daily practice of portfolio decision making are scarce, but recent literature provides new insight into the decision making processes that forego successful portfolios (Kester, Griffin, Hultink, & Lauche, 2011). The decision making processes described by Kester et al. (opinion- and evidence-based decisions) are closely connected and have great influence on one another, which makes them highly interdependent. This indicates that the compartmentalized presentation of the portfolio management tools might be troublesome for proficient implementation of portfolio management. However, bad portfolio management can suppress organizational performance in several ways, and therefore the lack of successful implementation deserves attention. In order to contribute to the success of portfolio management in practice, the main research question is; How can practical portfolio management tools be tailored to the interdependent portfolio decision making processes to increase success of the new product portfolio at company A?

Theoretical review

Portfolio management has four main objectives; a high value portfolio, portfolio balance, resource efficiency and strategic alignment. These goals can be achieved by means of effective portfolio decision making (Vergeer, 2013; Kester, Hultink, & Griffin, Forthcoming). The effectiveness of decision making is proven to be highly dependent on the processes which generate the input and on cultural factors. Therefore, in order to achieve effective portfolio decision making and realize the four portfolio management objectives, practical portfolio management tools should positively influence these input processes and cultural factors.
Based on the insights of existing literature, a new conceptual framework is created, which has two practical tools in the lead role; a collectively created scoring model and a strategic bucket tool. These tools have a positive influence on the project selection procedure, cross-functional trust, employee involvement and collaboration (relations (c), (d), (e), (f) and (g) in figure A). This combination of decision making tools allows for effective evidence- and opinion based decision making, since the combination of evidence- and opinion-based decision making allows to select radical and incremental innovation projects, an effective product mix can be created that creates both long- and short-term profits.

**Figure A; Conceptual framework for the proficient implementation of portfolio management**

From this framework, four design propositions originate that help to make a comparison of theoretical results with practice:

1. Evidence- & opinion-based decision making should be combined so that both incremental and radical innovation projects will be selected that enable creation of a high value, strategically aligned portfolio that is balanced and allows resources to work effectively.

2. The different functional areas should collaboratively determine the project selection criteria to increase acceptance and understanding of the decision making process, which will benefit trust in cross-functional input, allowing for more effective decision making.

3. Specific budgets should be assigned to project programs in the form of strategic buckets to ensure that the collective ambition of the program becomes the main platform driving all development activities. This will result in better cross-functional collaboration and thus better input generation for decision making.

4. A collectively created scoring model should be used to analyze projects, and projects should be arranged in programs by assigning strategic buckets. This combination of tools leads to effective decision making thanks to its positive influence on the quality of evidence- and opinion-based decision input (see proposition 2 & 3), creating a harmonized achievement of all four portfolio performance indicators.

**Empirical analysis and Evaluation**

By means of both qualitative and quantitative data collection (studying company documents, interviews, observations, a survey and focus groups), and in line with the case study method (Yin, 2009), the current decision making processes of company A were analysed. Comparison of these processes to the
framework propositions showed multiple deficiencies of the organization of portfolio management at company A. These were the main findings:

- The main product development related problems that are experienced by company A can be assigned to the lack of portfolio management.
- Company A is unable to achieve the four portfolio management goals; a high value portfolio, resource efficiency, portfolio balance and strategic alignment.
- Their inability to achieve these goals is caused by ineffective decision making processes.
- The formalized stage-gate process for project management allows for frequent decision making moments. But the unclear decision making criteria decrease the performance of the stage-gate process, since it is unclear what input is needed for the gate decisions.
- The short-term and output-driven decision making are impeding innovation and strategic alignment of the portfolio.
- The ambiguous program division (a mix of brand a program interests) is creating confused employees and hinders program effectiveness and efficiency.
- The lack of an innovation strategy leads to inefficiency in cross-functional cooperation and project selection.

**Step-by-step guide**

In order for company A to improve its current performance and efficiently react on environmental turbulence, it should implement portfolio management. As a result of this graduation project a guide is developed on how portfolio management could be implemented. This step-by-step guide can be summarized by the following aspects:

- Company A should formulate a clear innovation strategy.
- The resource expenditures should reflect the innovation strategy by means of predestined budgets.
- The budgets should be earmarked to different project types, ensuring that both long- and short-term projects receive attention.
- In addition to its current marketing budgets, company A should introduce development budgets to create awareness of costs related to development effort.
- Based on the earmarked program budgets, the category teams can formulate an executable program strategy.
- Company A needs to formulate clear project selection criteria to allow for focused and profitable new product development.
- Thanks to their expertise and experience, the members of the development departments are most likely to formulate effective selection criteria.
- The scoring model should be used to rank projects within the earmarked budgets, and to select the high-potential projects that fit the budget.

**Conclusion**

Company A’s current portfolio decision making processes do not lead to an effective portfolio. In order to improve the current processes and realise a successful portfolio, changes need to be made both on project, program and portfolio level by means of implementation of a bottom-up scoring model and the top-down strategic bucket tool.

The decision making tools that are suggested in the conceptual framework should be adjusted to the processes and preferences of individual organizations. To increase generalizability and validity of the research results, further research will be necessary.
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# Introduction

This document describes the report of the master thesis graduation project performed at a large organization that is active in the Fast Moving Consumer Goods industry (FMCG). Since this industry is quite competitive, the company (company A) prefers to remain anonymous to safeguard potentially sensitive information. This first chapter will introduce the research project by giving some theoretical and empirical background. Thereafter, the problem is defined, which leads to the research question. Finding an answer to the research question is the driving force behind the remainder of the document. The document setup is described in the last section of this chapter.

## 1.1 Theoretical background

In a world of strong global competition and consumer’s critical product comparisons, organizational survival increasingly requests firms to launch a steady stream of successful new products to the market (Killen, Hunt, & Kleinschmidt, 2007). The total range of products offered by a firm to its market can be referred to as the product portfolio.

In order to realize a stream of new products to be introduced to this portfolio, a firm must have multiple products in development at any point in time. This creates an environment where different projects in a company share common resources; a multi-project environment (Yaghootkar & Gil, 2012). The management of these multi-project environments can be divided into three management areas, each handling different levels of detail; Project management, Program management, and Portfolio management (Figure 1).

The most detailed level is concerning the achievement of individual project goals in a timely manner and within a given budget; project management. Program management in turn deals with multiple projects that together satisfy one objective. Portfolio management represents the most overarching level; it considers all projects and programs that compete for the same resources and aims to allocate the resources to the most profitable combination of projects. **Product portfolio management** can therefore be defined as “the set of activities that allows a firm to select, develop and commercialize a range of new products that will enable the firm to grow profitably over the long term” (Kester, Griffin, Hultink, & Lauche, 2011, p. 641).

Literature describes portfolio management tools that can be used to launch winning new products, but the lack of (proficient) portfolio management within organizations shows a discrepancy between theory and practice (Shane & Ulrich, 2004). Insights that resolve the challenges of daily practice of portfolio decision making are scarce, but recent literature has given new insight into the decision making processes that forego successful portfolios (Kester, Griffin, Hultink, & Lauche, 2011). The decision making processes show to be highly interdependent, which indicates that the compartmentalized presentation of the portfolio management tools might be troublesome for proficient implementation of portfolio management. Bad portfolio management can however suppress organizational performance in several ways (Figure 2), and therefore the lack of successful implementation deserves attention.
1.2 Empirical context

*Company A* is an international food producer in the so called Fast Moving Consumer Goods (FMCG) sector. The Dutch production plant of *company A* locally produces multiple brands on top of which they distribute products from their international production plants. In addition to production and distribution of its own brands, also Private Label (PL) products are produced for a variety of retailers.

The segment of the Dutch food market that *company A* operates in, is currently a difficult market for various reasons. To start with, the market knows many competing producers, resulting in a structural overcapacity for production; more than 20% production capacity is unused. In addition, the Dutch PL products are of high quality and represent a large and growing share of sales, which asks for the brands to be very distinctive for a low price. Moreover, the raw material prices are rising considerably due to decreased supply and increased demand in Asia. On top of that, major retailers such as Albert Heijn, SuperUnie and Jumbo are so influential in the product distribution, that they exert pressure on the profit margin of their dependent producers.

Given these conditions influencing the market, focus is largely on delivering value to the shareholders and doing more with less. This asks for effective and efficient investment of resources, and puts strain on selecting the right projects to produce winning new products.

*Company A* has recognized the need for optimization of its product development, and therefore has paid significant attention to the organization of its product development processes and procedures. A few years ago, it formalized its project management process by introducing the well-known Stage-Gate® method (Cooper, 2008). This method structures the product development process and allows for frequent assessment of project progress and potential. In addition to that, *company A* has introduced category teams to optimize the product offerings to the needs of the retailers.

Despite of the formalized project management process, and the introduction of category programs for program management, *company A* is still facing some problems in managing its multi-project environment. These problems originate from the fact that *company A* misses one management layer; portfolio management (Figure 1). What exact problems the company encounters will be described next.

---

1 (Repenning, 2001), 2 (Kester, Hultink, & Lauche, 2009), 3 (Cooper R. G., 2008), 4 (Loch, 2000), 5 (Cooper, Edgett, & Kleinschmidt, 1998)

Figure 2: Results of poor portfolio management
1.3 Problem definition

Since company A has multiple products in development at one point in time, it deals with a multi-project environment in which multiple projects share common resources. These resources should be allocated to the ‘winning new products’ to ensure maximal value creation. Company A however indicated that they are struggling to allocate the resources to the right combination of projects, and to set clear product development priorities.

Based on exploratory discussions and interviews, an idea was formed about the difficulties experienced within the company. These difficulties together identify the problem mess, which is the first step in Business Problem Solving (BPS) research (Van Aken, Berends, & Van de Bij, 2007).

Since organizational processes are quite complex, it can be difficult to indicate where the organizational problems exactly arise. It is however important to find the core issues since problems will hardly be solved when the symptoms are attacked rather than the core problem. Therefore, a problem analysis was made by following the stream analysis method of Porras (1987). The stream analysis guides the diagnosis of organizational ills and provides a roadmap to track down the core issues.

Following the stream method, problems are grouped together and interconnections are identified. Accuracy of the problem stream is confirmed with senior management, the company supervisor, and the university supervisor. By identifying interconnections between processes, distinction can be made between core problems, problems and symptoms.

For detailed information on the exact interconnections between the identified problems and symptoms, the stream analysis is displayed in Appendix A. What can be concluded from the stream analysis is the following:

The project selection process of company A is output-driven, based on quantitative performance forecasts such as sales volume and profit margin. The quantitative selection criteria create a disadvantage for radical innovation projects as they are harder to express in accurate predictions, and they need more time to pay-off (Kester, Hultink, & Lauche, 2009). Together with the company's dominant short-term focus, this leads to a misbalanced portfolio which is filled with incremental product development projects.

The gate committee doesn’t have an explicit long-term view of where the company wants to be in the future (there is no vision/long-term objective). This means that there is also a lack of strategy, which results in a total absence of focus; all projects that show promising forecasts or ‘intuitively feel right’, are selected for development. In turn, this leads to high pressure on the resources, with significant inefficiencies as a result (Cooper, Edgett, & Kleinschmidt, 1999; Repenning, 2001).

Due to the current organizational structure, different disciplinary subcultures arise with divergent goals and values. The lack of a common objective impedes effective cooperation due to the absence of (in)formal knowledge sharing.

Another problem that is clearly stated by the company employees is the ambiguous management support. Management does not seem to align their viewpoints and communication towards their employees. This leads to insufficient work guidelines, a fluctuating focus and a lack of a common objective throughout all layers of the organization.

Although this framing of the problems experienced by company A might seem extensive, this set of problems is commonly experienced in multiple organizations and researchers appoint these problems as the key problem areas of portfolio management (Chao & Kavadias, 2008; Killen, Hunt & Kleinschmidt, 2007; Cooper, Edgett & Kleinschmidt, 1997). As the stream analysis indicates, the problems are highly
interconnected and they all have the same overarching cause; a lack of (proficient) portfolio management.

**Insight 1; Problem definition**

*Company A* experiences problems to balance their portfolio, to align product development activities to a common objective, to set clear priorities and to spend resources efficiently. All of these problems can be attributed to poor portfolio management. Portfolio management aims to create the optimal portfolio in terms of value, balance, resource efficiency and strategic alignment. Achieving these four portfolio objectives is crucial to ensure (long-term) value creation and organizational survival. Therefore, it is important for *company A* to understand how they can proficiently implement portfolio management. However, the portfolio management tools that are described in literature find little use in practice, which asks for the portfolio management theory to be developed further to take the practice of portfolio management and portfolio decision making into account.

Based on this problem definition, the research objective and research question can be formulated. This will be done in the next paragraph.

1.4 Research question

As the problem definition indicates, *company A* is experiencing multiple deficiencies that result from poor portfolio management. Since they are not the only company that struggles to successfully implement portfolio management theory, the goal of this research is twofold;

First of all, this research aims to **increase the managerial impact of portfolio management theory by developing a conceptual framework for practicing portfolio management** which overcomes the compartmentalized character of prior research. To achieve this, the framework will align the practical portfolio management tools that are described by literature to organizations’ interdependent portfolio decision making processes. This will help organizations to use the appropriate set of management tools, which will ensure effective decision making that can lead to realisation of the portfolio management objectives.

Second of all, the aim is to **develop a step-by-step guide for *company A* to allow for proficient implementation of the framework’s propositions** in order to achieve successful portfolio management. This step-by-step guide will synthesise insights from the theoretical review and empirical analysis, while taking the preferences of the organization into account. Based on these two research goals, the following research question can be formulated:

**Insight 2; Research question**

How can practical portfolio management tools be tailored to the interdependent portfolio decision making processes to increase success of the new product portfolio at *company A*?

In order to find an answer to this research question, eight sub-questions are formulated (Figure 3). The answers to these sub-questions will together serve as a basis to find an answer to the main research question. The first four sub-questions will be answered by means of a theoretical review which will lead to the development of the conceptual framework, whereas the answer to the last four questions will be found by means of an empirical analysis. The empirical analysis will in turn help to evaluate *company A*’s current portfolio decision making practices, and will lead to the creation of the step-by-step guide for proficient implementation of portfolio management.
Theoretical review:

1. What is portfolio management, and when is it successful?
2. What practical tools should be used to achieve portfolio success?
3. How do decision making processes interdependently influence the portfolio outcome?
4. How can portfolio management tools be tailored to the interdependent portfolio decision making process?

Goal: Develop a conceptual framework that aligns practical portfolio management tools to the interdependent portfolio decision making processes.

Empirical analysis

5. How is portfolio decision making currently organized in company A?
6. What are the strengths and weaknesses of the current process?
7. What are the organizational preferences and insights for improving the process?
8. How can company A implement a more proficient portfolio management process?

Goal: Create a step-by-step guide for company A that enables proficient implementation of the framework’s design propositions.

Figure 3; Sub-questions that are formulated to answer the research question

The answers to abovementioned questions, the concluding framework and step-by-step guide will all be presented throughout the remainder of this document. How the document is organized will be discussed in the next paragraph.

1.5 Document setup

To find an answer to the questions stated in the previous paragraph, this document contains a synthesis of portfolio management theory and empirical analysis. The introduction in this first chapter has described the research context and presented the main research question, based on the problem definition. Chapter 2 will describe the methodology for the theoretical review and the empirical analysis. The framework that is developed in the theoretical review section (chapter 3) will guide data collection and empirical analysis (chapter 4). In chapter 5, the empirical processes are evaluated by means of comparison with the newly developed framework. Additionally, the organizational preferences are also evaluated in chapter 5 by means of two focus group sessions. Theoretical insights, insights from empirical analysis and evaluation are all used to create a step-by-step guide for portfolio management, which is described in chapter 6. Chapter 7 will present recommendations for company A on how to proceed with the guide. The report finishes with conclusions in chapter 8, where also the main research question is answered. Figure 4 gives an overview of the report structure and the discussed topics per chapter. Additionally, the figure shows in which chapters the answers to the sub-questions can be found. Throughout the report, insights are presented in distinctive text boxes. These insights provide answers to the sub-questions, and allow for a quick overview of the essence of the report.
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*Figure 4: Document setup and summary of the content*
2 Methodology

The case study method will serve as a guideline for this Business Problem Solving (BPS) project. This method gives structure by dividing the research process into different components so that a clear and rigorous process can be performed. The final solution that is delivered to company A should be aligned with the company’s daily activities. Therefore, to create a realistic advice, the research should focus on real-life, contemporary events and should not take control of these events. This makes the case study method an appropriate method for this research project (Yin, 2009).

The research design of a case study consist of five important components; 1) Research question, 2) research propositions, 3) unit of analysis, 4) the logic linking the data to the propositions, and 5) criteria for interpreting the findings (Yin, 2009). The research question, which is stated in chapter 1 (Insight 2) resulted from analysis of the problem mess and an initial review of existing literature. By means of a structured theoretical review, a framework is developed and design propositions are formulated which will direct empirical data collection, analysis, and evaluation. In the empirical analysis and evaluation, the data will be linked to the propositions, while using clear criteria for interpreting the findings. Thus, the research will comprise both a theoretical- and empirical analysis.

This chapter will first describe the research design for the theoretical review in paragraph 2.1, and second, the research design for the empirical analysis in paragraph 2.2.

2.1 Theoretical review

A sound BPS project is design-oriented, but always theory-based. After all, creating a research design and doing data collection based on theoretical concepts is one of the most important strategies for doing successful case studies (Yin, 2009; Van Aken, Berends, & Van de Bij, 2007). In line with Van Aken et al. (2007), this BPS project aims to use theory in a comprehensive, critical and creative manner.

Theory was used to conceptualize the stream analysis that resulted from initial empirical research (Appendix A). Conceptualization of the stream analysis helped to name and frame the business problem, which enabled a guided analysis of existing literature.

Analysis of existing literature focused on the portfolio management process, and the practical tools that could be used to support this process. This helped to answer sub-question 1 and 2 (Figure 3). Additionally, a model for decision making processes that underlie successful portfolio management is investigated, which provides an answer to sub-question 3 (Figure 3). This model formed a good basis for guiding portfolio success, but remained a bit abstract in comparison with the practical portfolio management tools. Therefore, the theoretical model of portfolio decision making is elaborated and complemented with practical portfolio management tools (sub-question 4, Figure 3). This leads to the creation of a new conceptual framework that guides the daily practice of portfolio management. The framework satisfies the first research goal: ‘Develop a conceptual framework that aligns practical portfolio management tools to the interdependent portfolio decision making processes’. This framework enables the formulation of design propositions that form the basis for further empirical analysis and evaluation.

2.1.1 Search method and source validity

For the systematic review of existing literature, two search strategies were used; the keyword strategy and the snowballing technique. By reading some articles of field experts Cooper and Kleinschmidt, an initial idea could be formed on what keywords would be relevant in the portfolio management literature (Appendix B). These keywords were used in the ABI Inform retrieval system to find related articles. In order to select only the most relevant articles, the search engine was constrained to find the keywords in
the title or abstract of the article. A manageable number of search results was strived for, so that the articles could personally be analysed on relevance. When a particular keyword resulted in too many articles to screen appropriately, the keyword was specified in more detail or accompanied by another keyword (Appendix B). Article titles, abstracts and conclusions were used to judge whether the article would be of use. Through this iterative search process, an initial number of useful articles was selected. To ensure that only high quality articles were used, the journal impact factor and the ABS 2010 ranking were used to check the journal quality (Harvey, Kelly, Morris, & Rowlinson, 2010).

In order to identify additional related research and go into the subject more thoroughly, the selected articles were read, and when they referred to a potentially interesting finding, the referenced article was tracked down. This snowballing technique led to additional articles that were again checked on their quality using the impact factor and ABS ranking (see Appendix C).

2.2 Empirical analysis

For a case study, it is essential to analyse the contemporary problem in its real-life context by means of an empirical analysis (Yin, 2009). The first step of the empirical analysis is the mapping of the current business processes, after which a business problem can be identified and validated, along with the causes of this problem (Van Aken, Berends, & Van de Bij, 2007). In order to keep the gathered input within feasible limits, it is important to establish the unit of analysis, the data that needs to be collected, and the methods to be used for data analysis and evaluation. To deal with some reliability and validity issues upfront, the empirical analysis has been carefully designed, for instance by using triangulating methods and data sources, paragraph 2.2.4 will further illustrate how research quality is safeguarded. First, The unit of analysis, data collection method, and data analysis will be discussed.

2.2.1 Unit of analysis

In line with the research question, the overall unit of analysis is the organization of the new product development (NPD) portfolio management process. Since the development department of company A has to deal with many different projects that ask for their development effort, it has been defined upfront which of these projects would lie within the scope of this research (Appendix D). Given that the portfolio management process is closely related to program- and project management processes, this overarching unit of analysis can be subdivided into smaller units of analysis. The development departments, the project teams, the category teams, the gate committee, etc. The insights gained by analysing these smaller units, including their activities, meeting notes, roles, etc., will allow to form an impression on the total organization of the NPD portfolio management process.

2.2.2 Data collection

In order to maximize reliability and validity of the data collection procedure, a multi-method approach is used. In total, five data collection methods were used: studying company documents, conducting semi-structured interviews, observing portfolio decision-making meetings, distribution of a cross-functional survey and discussion in focus groups (Table 1).

By studying company documents, an idea could be formed about the formal processes and protocols that are in place for portfolio decision making. Additionally, this data collection method allowed to get familiar with the organizational goals, organizational structure, the degree of information sharing, often-used terminology, etc. The information from the company documents provided good input for preparing the semi-structured interviews; the interviewee’s job description was known and by looking into meeting minutes it became clear what meetings he/she attended, and how these meetings were structured.
Interviews were arranged with management and executive staff from multiple disciplines (operations, marketing, sales, Research & Development (R&D)). This was considered to be important for gathering different perspectives, for instance on how the formal processes are put into practice, what informal factors play a role, and what problems arise. Interviews are easily subject to reactivity bias (Maxwell, 2005). To minimize this effect, leading questions were avoided and a small interview guide was used to keep the interview on topic, but leave room for the informant to elaborate on topics that he/she considered important, without guiding the answers (Appendix E).

To triangulate the interview data and company documents, some portfolio decision making meetings were observed as they allowed to see whether the practice corresponded with what the interview informants and company documents had indicated. Observations are less subject to reactivity bias (Maxwell, 2005), and therefore complement the interview data well. By means of these three data collection methods, the current business process and the business problem could be identified and validated, which helped to answer sub-question 5 (Figure 3), and presented the starting point for the theoretical review.

Table 1: Data collection methods and analysis

<table>
<thead>
<tr>
<th>Data collected to validate the current business processes and problem (before theoretical review)</th>
<th>Collection methods</th>
<th>Resources</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validate the business processes and problem (before theoretical review)</td>
<td>Company documents, semi-structured interviews, observations</td>
<td>Annual report, meeting minutes, website, project documentation, etc., 11 interviews; 5 higher management, 6 cross-functional employees, category meeting and product development meeting</td>
<td>Porras stream analysis (1987).</td>
</tr>
</tbody>
</table>

| Validate the causes of the business problem (after theoretical review) | Cross-functional survey, input sessions with focus groups | Survey send to R&D, Marketing and Sales departments, including their higher management. With respectively 80%, 100%, 52% and 100% response. One session with higher management of the development related departments. One session with cross-functional representatives of the development related departments. | Calculation of average factor scores and their standard deviations. Transcribed meeting recordings and debriefing with company supervisor. |

| Personalise the implementation guide | Input sessions with focus groups | Resources |

In order to validate the causes of the business problem, a survey was send out to the development departments of company A (R&D, Marketing and Sales) in addition to its higher management. The questions were based on the conceptualized problem analysis (Appendix A), and propositions of the causes that resulted from the newly created framework. The survey outcomes served as an input for evaluation of the business processes and therewith helped to answer sub-question 6; ‘What are the strengths and weaknesses of the current process?’ (Figure 3). To maximize validity of the survey outcome, the survey is a synthesis of surveys that have been used and validated in previous research (Appendix E).

Last but not least, input was collected by means of two focus group sessions. One session was organised with company A’s higher management. In the other session, cross-functional employees attended who are closely involved in the product development processes. Based on these sessions, an answer could be found to sub-question 7: ‘What are the organizational preferences and insights for improving the process?’ (Figure 3). Thanks to the input from the functional experts the sessions helped to personalise
the step-by-step portfolio management guide so that its applicability could be increased and the second research objective could be realised.

Resource selection

In order to yield representative results, data was gathered from different sources and multiple points of view (Table 1). This means that the survey, the focus groups and the interview included informants from different organizational levels (directors-management-executives), from different departments (R&D, marketing, operations and sales), and with different responsibilities and expertises (brand representatives, category managers, analysts, account managers, etc).

The respondents from higher management included the sales director, marketing director, operations director, business integration director, and the R&D manager. This higher management team is involved in the portfolio decision making, or directly experiences the effects of these decisions. Therefore, they have important insights on the current processes, and they will play a crucial role in changing these processes by means of the step-by-step guide. That is why this management team (MT) is asked for input by means of interviews, the survey and the focus group session.

In addition to higher management, members of the cross-functional departments were invited for interviews and for participation in a focus group. Input from cross-functional employees allowed to supplement the management input with operational insights. Here again, input was gathered from multiple points of view. Not only did informants work in different development departments (2 from R&D, 2 from marketing and 2 from sales), also their responsibilities and expertises differed. In order to talk to key opinion leaders whose combined input would be representative for the opinion of the full departments, management was asked for advice on who would be willing to talk openly about the current business processes, and company documentation was looked into to select different expertises and standpoints (representatives from the different brands, from different categories, and different departments were combined).

The survey allowed to attain input from a larger amount of respondents. Given the daily involvement of the R&D, marketing and sales departments in the new product development processes, all employees from these departments were asked to give their opinion on the current affairs.

2.2.3 Data analysis and evaluation

The company documents, interviews and observations result in high amounts of information, and the complexity of organizational processes makes it hard to interpret this information mess. Therefore, the stream analysis was used to organize the data and analyse the underlying processes (Porras, 1987). The stream analysis guides the diagnosis of organizational ills and provides a roadmap to track down the core issues. Following the stream method, problems are grouped together and interconnections are identified (Appendix A). When additional information was needed to confirm process interconnections, interview informants were contacted via mail, telephone or face-to-face. The stream analysis was checked for accuracy with senior management, the company supervisor, and the university supervisor, and was complemented when new information came to the surface. The stream analysis, which indicated flaws in the portfolio management processes, served as a basis for the theoretical review and the remaining empirical analysis (Table 1).

The propositions that were developed in the theoretical review were used as input for testing the causes of the business problem. The survey data that provided input for this validation was analysed by calculating average factor scores and standard deviations. Furthermore, distinctions were made between answers of higher management and executive staff to analyse differences in opinion.
To evaluate the organization of company A’s portfolio management process, the results of the data analysis were compared with the conceptual framework and propositions that resulted from the framework. The strengths and weaknesses of company A’s organization of the portfolio management process are identified based on similarities and differences with the conceptual framework and propositions.

Implementation of the theoretical framework can be dealt with in several ways. Therefore, based on the framework, some concept solutions to deal with company A’s deficiencies were formulated. What exact solution would work best for company A is very personal; it depends on their own preferences and insights on how the solutions could fit in the daily activities (Martinsuo, 2012). Therefore, company input is collected by means of two focus group sessions. These discussions provided important input to personalize the step-by-step guide for company A and deliver an optimal solution. How these sessions were organized will be further explained in chapter 5.3.

2.2.4 Data validity and reliability

To establish the quality of empirical research, four commonly used validity and reliability tests can be identified; construct validity, internal validity, external validity and reliability. To ensure the quality of this research, these quality indicators are guarded by implementing some predefined research tactics. The tactics that have been used are summarized in Table 2.

<table>
<thead>
<tr>
<th>Test</th>
<th>Case study tactic</th>
<th>Method</th>
<th>Research stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct validity</td>
<td>• Use validated measurement instruments</td>
<td>• Existing survey questions, ProMES meeting for focus group, Porras problem analysis, etc.</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td>• Instruments evaluated by expert</td>
<td>• University supervisor checked survey design, selection and meeting setup of focus group</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td>• Triangulation: Use multiple measurement instruments</td>
<td>• Company documents, interviews, observations, survey and focus groups</td>
<td>Empirical data collection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Research design</td>
</tr>
<tr>
<td>Internal validity</td>
<td>• View problem from multiple theoretical angles</td>
<td>• Portfolio management tools, decision making processes, Performance management</td>
<td>Theoretical review</td>
</tr>
<tr>
<td></td>
<td>• Pattern matching of predicted and actual measurements</td>
<td>• Framework suggests causes for successful portfolio management. Company A was expected to score low on these KPI’s</td>
<td>Data analysis; evaluation</td>
</tr>
<tr>
<td>External validity</td>
<td>• Find extensive support in theory</td>
<td>• Conceptualisation of empirical findings</td>
<td>Theoretical review</td>
</tr>
<tr>
<td>Reliability</td>
<td>• Use predefined research methods</td>
<td>• Research according to case-study method</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td>• Carefully document procedures</td>
<td>• Predefined theory search method, Filed interview minutes, focus group recordings, transcriptions, etc.</td>
<td>Empirical data collection</td>
</tr>
</tbody>
</table>

Construct validity is the extent to which a measuring instrument measures what it is supposed to measure (Van Aken, Berends, & Van de Bij, 2007). To ensure construct validity in this case study, multiple tactics were used. Firstly, when possible, existing and validated measurement instruments have been used (such as the survey model, interview guide and ProMES method for the cross-functional focus group). Secondly, the measuring instruments are evaluated by the university supervisor to filter out potential flaws. And lastly, a multi-method approach is taken to gather data (Table 1). The triangulation of data collection methods plays an important part in the validity of this research. By using several research methodologies for studying the same phenomenon, the collected data was triangulated to facilitate validation of the data trough cross-verification from multiple sources (Bogdan & Biklen, 2006). Triangulation was realised by means of a iterative approach to the qualitative data collection; when one of the data collection methods (interview, observations or company documents) indicated a problem,
strength or weakness of company A’s portfolio management processes, the phenomenon was relativized or confirmed by means of the other qualitative methods. This iterative process led to the conclusion that the problems that company A is facing are related to poor portfolio management. To further triangulate the data, a survey was used to validate this qualitative conclusion and reveal its causes. The input sessions in turn helped to measure how recognizable the survey results were for the organization, and whether the advice could be designed in such a way that it would fit the daily practice of company A. This constant checking and matching of data from different sources helped to get a thorough view on the situation, and therewith increased validity of the analysis and research outcome.

Internal validity is achieved when conclusions about relationships are adequate and complete. In order to detect the most complete list of possible causes of the business problem, the theoretical review therefore studies the problem area from multiple perspectives. Viewing the problem from multiple theoretical angles widens the perspective and therewith increases the chances of internal validity (Van Aken, Berends, & Van de Bij, 2007). The conceptual framework that was created in the theoretical review suggests some measurements that could indicate proficient portfolio management. Since the conceptualized problem analysis of company A indicated that it has problems with portfolio management, it was predicted that company A would score low on the portfolio performance indicators of the framework. Given that the empirical results coincided with the predicted results, internal validity of the framework is increased.

External validity refers to the generalizability of the research results to other situations and organizations. Although the direct aim of a BPS project is not to generate generalizable results, the external validity is safeguarded in this study by using extensive theoretic support for the practical advice.

Reliability is achieved when the results of the study are independent of the particular study characteristics, and thus can be replicated in other studies. To allow for replication of the research, the used methods and procedures are therefore carefully documented.

2.3 Conclusion

This chapter presented the methodology that is used to perform a rigorous case study. The case study comprises a theoretical review, and an empirical analysis and evaluation. The initial naming and framing the business problem by means of a stream analysis (Porras, 1987), allowed for a guided analysis of the existing literature. The theoretical review (discussed in chapter 3) will lead to the creation of a conceptual framework for proficient portfolio management, and therewith answers the first four sub-questions. This framework and its underlying propositions form the basis for further empirical analysis and evaluation.

The empirical analysis (discussed in chapter 4) includes analysis of organizational documents, semi-structured interviews, observations, survey results regarding the portfolio management process, and discussion in focus groups. To safeguard the quality of the research, much attention is paid to the reliability and validity of the empirical analysis. The empirical analysis and evaluation will answer the last four sub-questions and concludes with a step-by-step guide for the proficient implementation of portfolio management at company A.
3 Theoretical review

This chapter will give an overview of the theoretical review. The theoretical review is performed to name and frame the business problem and guide data collection, empirical analysis and evaluation. This chapter is organized as follows: Paragraph 3.1 goes into the concept of portfolio development and its objectives, therewith answering the first sub-question; ‘What is portfolio management and when is it successful?’. Additionally, this paragraph will discuss the use of portfolio management tools to answer the question ‘What practical tools should be used to achieve portfolio success?’. Paragraph 3.2 illustrates the portfolio decision making processes and finds an answer to the question ‘How do decision making processes interdependently influence the portfolio outcome?’. Based on these insights, a new conceptual framework will be developed, along with design propositions that will answer question 4: How can portfolio management tools be tailored to the interdependent portfolio decision making process?’. The newly developed framework will be discussed in paragraph 3.3.

3.1 Portfolio management

The first sub-question is ‘What is portfolio management and when is it successful?’. In order to answer this question, portfolio management will first be defined, after which its objectives and prerequisites for success will be discussed.

Portfolio management helps to maintain overview over all projects that make use of the same resources, and can be defined as “the set of activities that allows a firm to select, develop and commercialize a range of new products that will enable the firm to grow profitably over the long term” (Kester, Griffin, Hultink, & Lauche, 2011, p. 641). The objective of implementing portfolio management is fourfold (Cooper & Edgett, 2001):

1) Maximize the portfolio value – Most companies are judged on the value they create for their shareholders. For this reason, a high return on investment should be achieved by selecting today’s projects that will become tomorrow’s new product winners (Cooper & Edgett, 2001). Therefore, portfolio management aims to allocate resources to the most valuable combination of projects.

2) Ensure portfolio balance – The goal of a balanced portfolio is to have a harmonized combination of projects in terms of long- and short-term projects, higher-risk and lower-risk projects, across a variety of markets, project types and project categories. This balance is desirable as it ensures efforts to be distributed amongst different fields of attention. A misbalanced portfolio can incur multiple organizational problems such as resource inefficiency due to high work pressure, low portfolio value as the high-potential projects are supplied with insufficient resources, and inability to align the portfolio to the long-term strategy of the firm. Kester et al. (Forthcoming) have therefore established that when a firm’s portfolio is not appropriately balanced, it could be challenging to achieve the other portfolio goals. Balance thus plays an important role in achieving portfolio success. Therefore, portfolio management processes keep track of the projects in the portfolio pipeline and aim to (re)direct activities to maintain a balanced combination of projects.

3) Achieve strategic alignment – aligning the NPD efforts with the innovation strategy allows for a strong and distinctive competitive position, which will last on the long- and short-term. The lack of focus that results from poor strategic alignment would lead to the inability to select the right projects as the short-term reasoning makes companies feel the pressure to get just anything on the market, they have a sunk cost reasoning, they have nothing better to work on, and portfolios are overfull with short-term, low-risk projects (Cooper & Edgett, 2003). Portfolio management therefore aims to select projects guided by a focused NPD strategy.

4) Realize resource efficiency – High resource utilization increases organizational efficiency, unless the process reaches its tipping point. When this happens, for example by overloading employees with work
pressure, the NPD process will go into firefighting mode. Firefighting refers to the unplanned allocation of resources to solve problems at a late stage of the project, while this unplanned allocation incurs new problems at other projects. Due to this vicious circle, the assignment of an extra project this year will reduce the number of products released for multiple years to come (Repenning, 2001). Therefore, a successful portfolio can only be achieved when the right number of projects is in the portfolio pipeline.

Optimally, portfolio management enables simultaneous achievement of these four portfolio goals. However, this optimal performance can only be pursued when all different management processes in the multi-project context are aligned to achieve the portfolio management goals.

3.1.1 Contextual preconditions for successful portfolio management

To achieve optimal performance of the portfolio, the issues that are relevant for success in portfolio management should also be built into the way projects and programs are managed. First, this paragraph will describe how project management can be organized in order to contribute to portfolio management success. Second, it will be discussed how program management can be organized in order to contribute to this same goal.

*Project management* - A project can be seen as a ‘temporary organization’ which is founded for a specified period with the goal to contribute to the long-term performance of the permanent organization (Teller, Unger, Kock, & Gemünden, 2012). The projects can thus be regarded as the building blocks of a portfolio. This makes that effectively organized projects could deliver substantial value to the portfolio.

Empirical evidence shows that project success is positively influenced by project management formalization (Milosevic & Patanakul, 2005). Each project then has a reproducible and shared core process and follows an established combination of project phases, gates, milestones, activities and major deliverables (Milosevic & Patanakul, 2005).

An example of a project formalization tool is the well-known and often-used Stage-Gate® process, which provides a playbook for moving new product projects from idea to launch (Cooper, 2008). In the Stage-Gate® model, the project is divided into related stages in which the project team performs the necessary tasks such as data collection, analysis, development etc. After each stage, a gate follows where go/kill decisions are made to continue investment in the project (Figure 5).

![Figure 5](image)

*Figure 5; A typical Stage-Gate system for new product development (based on Cooper, 2001)*

For portfolio management, the main advantage of a formalized project process is that comparison between different processes becomes possible. Therefore, one can easier learn from processes, coordination between different projects becomes simpler, processes become more reliable and can be performed in a shorter time (Teller, Unger, Kock, & Gemünden, 2012). Furthermore, the frequently scheduled go/kill moments at the gates allow for a continuous revision of the current portfolio, ensuring that resources are only allocated to the truly deserving projects.
Program management - Thanks to the clear and well-defined scope of projects, project managers are able to pursue a specific goal and plan activities that will step-by-step lead to the achievement of this goal. However, portfolio success depends on the mutual impact of, and synergies between, these projects. Therefore, the fragmentation caused by the autonomous projects can lead to inefficiency (Figure 6) (Buuren, Buijs, & Teisman, 2010).

![Figure 6; Scattered focus without program management (a), increased efficiency with program management (b)](image)

Program management can be seen as a tool to overcome this fragmentation by monitoring the aggregated effect of the single projects that are set up to satisfy one common objective; the program strategy. This program strategy provides the program managers with an actionable handheld that bridges the gap between the strategic nature of the portfolio and the operational nature of development projects (Milosevic, Martinelli, & Waddell, 2007).

Strategic alignment of the programs with the portfolio is best achieved when the projects in one program have shared resources at their disposal, since it forces program managers to consider the interdependency between the projects, and preselect projects to which resources should be allocated (Buuren, Buijs, & Teisman, 2010).

Thus, by aligning projects and resources, program management aims to accomplish strategic objectives that would not be taken into consideration by separately working project managers.

Insight 3; What is portfolio management and when is it successful?

Portfolio management can be defined as “the set of activities that allows a firm to select, develop and commercialize a range of new products that will enable the firm to grow profitably over the long term” (Kester, Griffin, Hultink, & Lauche, 2011, p. 641). It can be considered successful when it enables harmonious achievement of the four main portfolio goals; a high value portfolio, portfolio balance, strategic alignment and resource efficiency. Achievement of these four goals asks for the issues relevant for portfolio management to be built into the way projects and programs are managed. Project management is therefore advised to be formalized and programs should be managed with shared resources at their disposal.

In order to realise achievement of the four portfolio management objectives, literature describes some practical tools. The most frequently used tools will be discussed in the next paragraph.
3.1.2 Portfolio management tools

For each of the portfolio management objectives, literature presents some practical portfolio management tools. In this paragraph, an answer will be sought to the question ‘What practical tools should be used to achieve portfolio success?’ Figure 7 presents an overview of the most frequently used tools. This paragraph illustrates some of these tools and their effects in practice.

<table>
<thead>
<tr>
<th>Portfolio value</th>
<th>Financial models (NPV, Productivity Index) Real Options, and Scoring models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio balance</td>
<td>Portfolio mapping (Bubble diagram, Pie-chart, Project funnel)</td>
</tr>
<tr>
<td>Resource efficiency</td>
<td>Resource limits, focus</td>
</tr>
<tr>
<td>Strategic alignment</td>
<td>Top-down; Strategic buckets &amp; roadmap, Bottom-up: scoring model</td>
</tr>
</tbody>
</table>

Figure 7; Suitable tools to achieve portfolio goals as described in literature

**Portfolio value** – Portfolio value can be measured by traditional financial models such as Net Present Value (NPV), Internal Rate of Return (IRR) and the Productivity Index (PI) which divides the NPV by the constraining resource (for instance NPV/ R&D-hours spend on the project) to find the projects that generate most value per resource used (Cooper, Edgett, & Kleinschmidt, 1999). More elaborated methods include Real Options and scoring models. The scoring model determines the value of the project beyond just financial measures, but also incorporates value producing factors such as market attractiveness and technical feasibility. The different scoring factors are added to come to a total project attractiveness score, and projects are prioritized based on this attractiveness score (Cooper & Edgett, 2001). Since the scoring model can also score the project on strategic alignment, this tool can also contribute to achievement of that portfolio objective.

**Portfolio balance** – For Portfolio balance mainly visualization tools are used to describe the current state of the portfolio. Based on this visualization, decisions can be made on how the resources should be (re)allocated to achieve the desired portfolio balance (Cooper & Edgett, 2001).

**Resource efficiency** – In order to safeguard resource efficiency, the gates in the project Stage-Gate® model could ask for the project teams to specify their resource requirements in terms of who is needed, and how many working-hours there would be needed. The gate committee can then rank the projects until all the resources are allocated – the projects that are not selected due to resource limits, are put on hold. When the project teams are not able to perfectly forecast the required resources, slack should be built into the resources to serve as a buffer against firefighting (Repenninig, 2001).

**Strategic alignment** – Strategic alignment can be realized by means of top-down and bottom-up portfolio methods. One of the often used top-down methods is the implementation of strategic buckets. This method is based on the fact that once the allocation of development resources reflects the innovation strategy, the resulting project portfolio will be aligned to the strategy (Chao & Kavadias, 2008). Resources are therefore split into proportional buckets of money or person-days to be spent on a specific development program in order to realize its attack plan; programs that play a central role in achieving the new product goals get more resources than strategic programs that play less important roles in achieving the goals. The projects that share the same bucket(budget) are then prioritized within that specific bucket. Another top-down approach also uses the innovation strategy as a basis, but instead of strategic resource buckets, this method results in a product roadmap. In this approach, major development initiatives that need to be performed in order to achieve the new product goals are mapped onto a timeline (Cooper & Edgett, 2001). Strategic alignment of the product portfolio could also be achieved by guided selection of single projects; the bottom-up approach. In this approach, the formalized gates in the project process are made sure to select the good and kill the poor projects (Figure 5). As mentioned earlier, the scoring model creates the possibility to judge project value beyond
financial measures. By implementing strategic criteria into these gate decisions, the selected projects can be strategically aligned (Cooper & Edgett, 2001).

All portfolio management tools that are presented in Figure 7 have advantages and disadvantages. To indicate benefits and struggles that the different tools encompass, Table 3 shortly summarizes these advantages and disadvantages.

Table 3; Advantages and disadvantages of portfolio management tools

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial methods Clear and easy to use</td>
<td>Disfavour high risk projects(^2). Hard to estimate in the first project stages</td>
</tr>
<tr>
<td>Options thinking Allows to see uncertainty as possible gain(^3)</td>
<td>Takes time. Hard to estimate in the first project stages</td>
</tr>
<tr>
<td>Scoring model Rates projects on non-economic factors, achieve strategic alignment(^4)</td>
<td>Hard to find right scoring factors and to score objectively</td>
</tr>
<tr>
<td>Portfolio mapping Clear visualization of current projects and resource allocation</td>
<td>Not a predictive tool, rather descriptive information display(^3)</td>
</tr>
<tr>
<td>Resource limits Allows resources to work efficiently and produce quality(^5)</td>
<td>Hard to estimate a project’s resource requirements on forehand</td>
</tr>
<tr>
<td>Strategic buckets Strategic alignment and inclusion of longer-term, higher-risk project(^6)</td>
<td>Which projects should be put into one bucket to share resources?</td>
</tr>
<tr>
<td>Product roadmap Clear step-by-step future plan</td>
<td>Results in a fairly rough overview that leaves too much room for adjustments</td>
</tr>
</tbody>
</table>

\(^1\) (Kester, Hultink, & Lauche, 2009) \(^2\) (Faulkner, 1996) \(^3\) (Cooper & Edgett, 2003) \(^4\) (Cooper & Edgett, 2001) \(^5\) (Repenning, 2001) \(^6\) (Chao & Kavadias, 2008)

Although literature describes the portfolio management tools clearly and in practical detail, research has shown that none of these tools is able to independently achieve portfolio success; the top performing businesses therefore use multiple portfolio management tools (Cooper, Edgett, & Kleinschmidt, 1998). The optimal result will be achieved when the management tools are aligned and the disadvantages of one tool are sufficiently covered by the other’s advantages. But then the question arises: when are the tools aligned?

The decision to follow through with a project idea should simultaneously consider the value that it brings to the company, whether it retains portfolio balance, if the resources can handle the initiation of jet another project, and if it aligns with the organizational strategy. Therefore, other than the compartmentalized presentation of portfolio management tools in literature suggests, portfolio management should not be about independent achievement of the four portfolio goals, it should be about making effective decisions on what project to start, continue or discontinue in order to achieve a harmonized combination of all four goals (Figure 8).

![Decision making](image)

**Figure 8; Effective decision making should result in a harmonized achievement of all performance metrics**
Insight 4: What practical tools should be used to achieve portfolio success?

Multiple tools have been described in literature that can help achievement of the portfolio objectives. Since individual tools do not generate optimal results, the top performing business use multiple portfolio management tools (Cooper, Edgett, & Kleinschmidt, 1998). What combination of tools should be used to generate the optimal result is however unclear.

In order to understand when portfolio management tools are sufficiently aligned to harmoniously achieve the four portfolio objectives, it is important to look into the decision making processes that are needed for successful portfolio management and answer the question: ‘How do decision making processes interdependently influence the portfolio outcome?’ This question will be addressed in the next paragraph.

3.2 Effective portfolio decision making processes

The previous paragraph concluded that portfolio decision making effectiveness is mostly achieved by using multiple decision making tools. Thus, in order to know how to put portfolio management into practice successfully, an idea has to be formed on how the different decision making processes interact. Therefore, this chapter will describe the model of Kester et al. (2011) which approaches portfolio management as an interdependent decision making process rather than a compartmentalized achievement of the different portfolio objectives. This will lead to an answer to sub-question 3: ‘How do decision making processes interdependently influence the portfolio outcome?’

3.2.1 KPI for effective decision making

The model shows that portfolio decision making effectiveness can be recognized by three main performance indicators (Figure 9): Portfolio mind-set (the decisions made and actions undertaken are based on a complete understanding of all the NPD projects and their interrelatedness within the portfolio), Focus (short-term actions are performed to generate longer-term success), and Agility (the ability to quickly make decisions on project initiation and termination).

![Figure 9: A general model for portfolio decision making, (by Kester et al., 2011)](image_url)
The decision-making effectiveness results from the combined use of three decision-making processes; evidence-based, power-based and opinion-based.

Evidence-based decision making is mostly quantitative; the decisions are based on detailed assumptions supported by factual information from technical, financial and market analysis. The evidence-based decision making tends to favour incremental development projects over radical innovation, since major innovation opportunities are inherently riskier and thus harder to express in quantitative data.

Power-based decisions exist when people or even company goals are dominated by other people in the company. Here, the individuals or subgroups might use their power to manipulate the decisions in their interest, for instance by tweaking the numbers in the financial evaluation to come to their desired outcome. Decision making based on power is about individual interest and it may not take the best interest of the firm into account. This kind of decision making should therefore be avoided.

Opinion-based decision making is based on experience and feelings rather than on facts. The effectiveness of opinion-based decision making is dependent on who delivers the input to make the decision. When the decision is made by an expert, intuition can lead to making the right decision in a short time. However, when the decision is made by someone who is less experienced, intuition might lead to making the wrong decision (Kester, Griffin, Hultink, & Lauche, 2011). Decisions thus result from these three decision making processes. The type of process or combination of processes that are used influences decision making effectiveness (Table 4).

<table>
<thead>
<tr>
<th>Decision process</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence</td>
<td>Objective judgement, clear selection criteria,</td>
<td>Hard to achieve strategic alignment, mainly</td>
</tr>
<tr>
<td></td>
<td>easily judged</td>
<td>incremental projects are selected</td>
</tr>
<tr>
<td>Power</td>
<td>Quick decision making</td>
<td>Often not in best interest of the firm</td>
</tr>
<tr>
<td>Opinion</td>
<td>Quick decision making, allows for selection of</td>
<td>Can lead to inappropriate decisions when</td>
</tr>
<tr>
<td></td>
<td>longer-term and higher-risk projects</td>
<td>decision-maker is not an expert</td>
</tr>
<tr>
<td>Power &amp; Opinion</td>
<td>Quick decision making, innovative projects not</td>
<td>Overfull portfolios, not likely to lead to</td>
</tr>
<tr>
<td></td>
<td>necessarily disadvantaged</td>
<td>strategic alignment</td>
</tr>
<tr>
<td>Evidence &amp; Opinion</td>
<td>Includes both innovative and incremental</td>
<td>Time consuming, could still overstretch the</td>
</tr>
<tr>
<td></td>
<td>projects, enables strategic alignment</td>
<td>resources</td>
</tr>
</tbody>
</table>

In the empirical context of this research, innovation represents medium to high importance to achieve the organizational strategy (Vergeer, 2013). Therefore, a successful portfolio is most likely to be achieved by the combined use of opinion-based decision processes and evidence-based processes, because this combination uses objective criteria when possible, but doesn’t leave out the radical innovations when the opportunities are harder to quantify (Table 4) (Miles & Snow, 1978; Kester, Hultink & Lauche, 2009).

3.2.2 The influence of cultural factors

Previous paragraph established that effective portfolio decision making should avoid power-based decisions, and rather can be achieved by the combined use of evidence- and opinion-based decision making processes, provided that they are based on sound decision making input. The fact that opinion based decisions only lead to effective decisions when the input is based on an expert’s intuition, illustrates the importance of the input generating process. The input process that influences power-based decisions is politics, whereas evidence-based decisions are influenced by cross-functional collaboration, practices of critical thinking and practices of market immersion.

Kester et al. (2011) identify three main cultural factors that influence the way that decision input is generated; trust, collective ambition and transformational leadership (Figure 9). Since input generation
plays a major part in the effectiveness of the decision making process, the cultural factors have an indirect, yet important influence on decision making effectiveness. Therefore, these three cultural factors will be shortly addressed, along with the way they exert influence on the decision making input.

Trust refers to the extent to which people are comfortable with inputs from other functions. When people have trust in each others’ inputs, it will naturally benefit cross-functional collaboration. Also critical thinking will be positively influenced by trust as people will be more comfortable with answering critical questions. Politics are negatively influenced by trust as trust will allow people to have a common problem-solving attitude instead of having their own agenda (Kester, Griffin, Hultink, & Lauche, 2011).

When people share common goals and work towards the same objective, one can speak of a collective ambition. Collective ambition is needed to enable cross-functional collaboration and will reduce politics since everyone strives for a shared objective rather than having their own agenda.

Transformational leadership is in place when managers are accessible and approachable, encourage people to think strategically and to develop their expertises. This cultural factor plays a big role in the decision making effectiveness as it influences all five input generating processes; ensuring that managers do not function from an ivory tower will increase collaboration, decrease politics and ensures that experts can influence the decision making which benefits the value of intuitive input. Additionally, incorporating a transparent decision making process enables the input for evidence-based decision making to be better tailored to the input required for the analysis.

**Insight 5: How do decision making processes interdependently influence the portfolio outcome?**

Effective portfolio decision making can be achieved by the combined use of evidence- and opinion-based decision making processes. By means of the cultural factors that influence both the quality of evidence-and opinion-based decision making processes, the portfolio decision making effectiveness is shown to result from an interdependent process (Figure 9).

While previous research has described the portfolio decision making tools independently (Figure 7), Kester et al. (2011) have managed to model the interaction between the decision making processes and show how they interdependently influence the portfolio outcome. The model of Kester et al. (2011) however stays a bit abstract whereas the independent tools in literature are described in quite practical detail. It would therefore be interesting to see how the practical tools described in paragraph 3.1 could fit into the interrelated process of decision making (paragraph 3.2) so that managers know through what mechanisms they can improve the decision making effectiveness and thus successfully implement portfolio management. The next section will therefore present a new conceptual framework.
3.3 A conceptual framework for practicing portfolio management

Based on insights from previous paragraphs, a conceptual framework is developed that combines the abstract model of decision making and the practical decision making tools to practically describe through what mechanisms the decision making effectiveness can be approved. The model is composed of a top-down and a bottom-up decision making tool to ensure sound decision making throughout the different management layers of the multi-project environment.

In this chapter, the different aspects of the framework will be described. First, it is explained that decision making effectiveness is related to the four portfolio goals. Second, the top-down portfolio management tool is described, which is selected to positively influence the decision making process. Paragraph 3.3.2 will explain why this tool is selected. Third, the bottom-up tool is described along with reasoning behind its selection in paragraph 3.3.3. This finally results in a new conceptual framework that answers sub-question 4: ‘How can portfolio management tools be tailored to the interdependent portfolio decision-making process?’. This section will end with some design propositions, based on this conceptual framework.

3.3.1 Effective decision making to achieve portfolio objectives

The relation between effective decision making and achievement of the portfolio management objectives has been predicted and explained by Vergeer (2013). Kester et al. have confirmed these relationships in their follow-up research (Forthcoming). From this, it can be concluded that; if an effective decision making process can be realized by means of a combination of portfolio management tools, the portfolio can become successful.

In paragraph 3.2 it has already been mentioned that a combination of evidence-based and opinion-based decision making should be used to assure an optimal composition of company A’s portfolio. Effective decision making is primarily dependent on the input generated and the cultural factors that influence the decision making process. In order to develop a practical framework that allows for proficient portfolio management, input generation processes and cultural factors should thus be positively influenced by the portfolio management tools.

As paragraph 3.2.2 explains, transformational leadership plays a central role in portfolio decision making, as it influences all 5 input generating processes. This cultural factor is therefore chosen as the starting point of the conceptual portfolio management framework (Figure 10), which means that the portfolio management tools should encourage people to think strategically and to develop their expertise, incorporate a transparent decision making process, etc.

Figure 10; A theoretical framework on how to practice portfolio management
With transformational leadership as a prerequisite, two tools have been selected that express transformational leadership (Figure 10, (a) & (b)) and proved suitable for fostering the other cultural factors; trust and a collective ambition. These tools are 1) a collectively created scoring model and 2) strategic buckets that are assigned to project programs. Why these two tools are selected will be explained next.

3.3.2 Strategic buckets for programs

The first tool that is selected is the strategic bucket tool. With the strategic bucket tool, organizational budgets are allocated to programs in such a way that the distribution reflects the strategic priorities; when one program is more important in realising the innovation strategy, this program should receive more budget than the other. The buckets therewith present a good opportunity to align expenditures with the strategic aspirations of the firm. The program budget is then further subdivided into buckets through which new product goals can be achieved (Figure 11). Dependent on the size of the program budget and the proportional size of the buckets, programs can then create their own plan of attack. This tool is a top-down tool through which higher management can guide development efforts to be in line with the innovation strategy. Additionally, by means of the predefined resource allocation that is realized by creating strategic buckets, balance across markets and innovation types can be achieved, which is a major target in portfolio management. The top-down tool is mostly about the collective effect of the budget decisions; when resources are spend this way, would the resulting portfolio composition be as we want it to be?

One of the reasons why this tool is selected is because of its positive influence on one of the cultural factors; collective ambition (g). Managing projects within programs allows for alignment of efforts by means of a clearly specified objective (Milosevic, Martinelli, & Waddell, 2007). The introduction of programs allows the programs to formulate a program strategy which will be more executable than the main innovation strategy thanks to its increased level of detail. The executable strategy allows the program team to have an unambiguous common goal, which increases the chance of successful collaboration. The shared resources for the projects within the programs further stimulate this desired effect; instead of the functional areas deciding for themselves how they want to spend their own budget, the program becomes the main platform in which the budget expenditures are decided cross-functionally. Shared resources will also decrease competition between the programs and therefore allows programs to focus on putting their own plans into practice without direct interference with the other plans. Moreover, dividing the resources ensures that programs preselect competing projects that would benefit program goal achievement, and that they plan them realistically (Buuren, Buijs, & Teisman, 2010). To conclude, the collective ambition stimulates cross-functional collaboration and therewith positively influences evidence-based decision making, since different expertises can be combined into an extensive basis for making informed decisions (l).

Even though management predefines the budgets that are available for certain program activities, the program teams still receive much freedom to determine the program strategy and action plan. The program teams are involved in the realization of the innovation strategy by formulating how they would
contribute to achievement of the innovation strategy (f). When management hands the program teams with the responsibility to create their own program action-plan, employees are expected to feel empowered and more involved. This might lead them to actively search and communicate new product ideas and opportunities to improve practices, which will increase organizational wide practices of market immersion. When (higher) management shows openness to these ideas and undertakes actions in reaction to good ideas, the level of market immersion is expected to rise within the company, which positively influences the evidence-based decision making process (k).

3.3.3 Collectively created scoring model
The second tool that is selected is the scoring model. As explained before, the scoring model evaluates individual projects on some predefined criteria such as market attractiveness, technological feasibility and strategic alignment. This bottom-up approach includes decision making on a more operational level by considering individual project potentials. In combination with the top-down bucket tool, a thorough decision making process is created since goal achievement is assured both by top-down and bottom-up processes. The collectively created scoring model will benefit the decision making process in four ways (Figure 10):

Firstly, the scoring model is advised to be collectively created by a delegation of the development departments. Because for employees to understand and appreciate the necessity of their colleagues’ input, agreement on what input is required should be achieved first. The different functional departments should therefore come to an agreement on what criteria should be used to analyse projects, and what functional departments can best deliver the input needed to judge these criteria, based on their expertise. This approach is based on the concept of acceptance and cognitive understanding of the work requirements, in this case, the input required. Pritchard et al. (2002) showed that people will perform better when they feel that the assessment of their work is based on the right criteria, and the criteria are scored and weighed fairly (acceptance). Thus, when the members of a project team agree on the criteria that the project has to meet, they are likely to perform better on delivering the input needed to judge these criteria. On top of that, when the employees participate in setting these criteria, they are shown to increasingly recognize their importance and express increased commitment to achieve them (cognitive understanding) (Kleingeld, Van Tuijl, & Algera, 2004). Letting employees cooperate in the creation of a scoring model for project assessment is thus expected to positively influence acceptance and understanding of cross-functional input, and therefore enhances trust in each other’s input (d). Whether or not people trust input from other functions is an important cultural factor for evidence-based decision making; it influences cross-functional collaboration and practices of critical thinking (i).

Secondly, the introduction of a scoring model allows for project evaluation based on both qualitative (strategic fit, competitive advantage, etc.) and quantitative criteria (sales forecast, risk-reward expectations, etc.). The qualitative criteria allow for opinion-based decision making which benefits the innovative nature of the portfolio (j) (Kester, Hultink, & Lauche, 2009). Opinion-based decisions make use of intuition as an input. This input will only be effective when the decision is made by experts, therefore, the qualitative factors that are included in the scoring model should be scored by the employees that can base their decision on previous experiences and expertise (e). During the collective creation of the model, the development departments should therefore decide who will be best able to score what qualitative factor.

Thirdly, the scoring model that results from the cross-functional dialogue is based on summarized experiences and expertise and can serve as a thorough selection tool for the gate decisions, leading to gates with teeth (c). Since gates with teeth will filter out low-potential projects and the poorly supported
ones, a critical attitude towards the input gathered will be needed to increase chances of passing the
gates. Increased input quality will lead to more effective evidence-based decision making (h).

Fourthly, just like the bucket tool, the scoring model tool encourages employee involvement in the
realization of the innovation strategy (f). Thanks to this increased involvement and empowerment of the
employees, employees are triggered to actively search for and communicate opportunities. This is
expected to positively affect practices of market immersion and therefore benefits evidence-based
decision making (k).

3.3.4 Optimization of the decision making tools

As Figure 10 explains, the scoring model and the strategic buckets will most probably lead to effective
decision making. However, it is important that the factors in the scoring model and the weights of these
factors indeed reflect the organizational interests and priorities. Furthermore, the portfolio outcomes
should be monitored regularly to see if the bucket distribution generates the desired effect. To make
sure that the decision making tools are optimized for the organizational needs, some feedback loops are
implemented in the model which enable coordination of the decision making tools to the portfolio
management goals (Figure 12).

As can be seen in Figure 12, the feedback loops could make use of the other decision making tools
discussed earlier (Figure 7). These ‘feedback’ tools are used to measure the overall portfolio
performance, rather than measuring the potential of single projects. When the portfolio value turns out
to be dissatisfactory, it could be that the financial factors in the scoring model have too little influence on
the total attractiveness score of a project. Therefore, it is advised to regularly review the scoring model
and fine tune it to the needs of the organization. Feedback loop [A] can be used to analyse the overall
portfolio and optimize the weights in the scoring model by means of financial models.

Given the long-lasting negative impact of resources that work in firefighting mode, also resource
efficiency requires a feedback loop. When resources are experiencing too much pressure, it could be that
the estimation of work load isn’t sufficiently influencing the portfolio decision making. Feedback loop [B]
therefore ensures that the level of resource occupation influences the gate decisions, so that the gates
select projects until resources are running out, and sufficient slack is incorporated when the resource
requirements are harder to estimate (Repenning, 2001).

Portfolio balance, as explained, is a crucial factor for portfolio success. It is therefore important for
higher management to constantly keep track of the state of the portfolio in terms of this balance.
Mapping the portfolio state by means of bubble charts, pie charts or the funnel process, will help to
identify discrepancies between the current and the desired state of the portfolio. When discrepancies
indeed occur, management could consider changing the distribution of the resources over the different
buckets. When we take the buckets in Figure 11 as an example, management could for instance
reallocate budget from the ‘improvements and modifications’ bucket to the ‘advanced technologies’
bucket when the portfolio contains too many short-term projects. Likewise, resource allocation amongst
the buckets should be monitored to ensure that the organizational spending reflects its strategy. It
should therefore distinguish NPD spending between the development programs and the buckets within
these programs; if one program plays a big role in the innovation strategy, it should receive more NPD
resources than another program that is mainly aimed at harvesting past investments. Also, when one
development bucket within these programs plays an important role, the spending ratio should reflect
that by having increased budget assigned to this bucket (Figure 11).

With these feedback loops, the theoretical framework for successful portfolio management is
completed. The next paragraph will present some design propositions that will help to put the
framework into practice.
A substantial body of research has been focused on the question of which innovation project to pursue. Surveys have however shown that the recommended project selection tools have so far found very little use in practice (Shane & Ulrich, 2004). This might be because few companies have been able to find the optimal combination of tools due to the compartmentalized presentation and use of these tools, while they actually interact by means of interdependent portfolio decision making processes. This research therefore aimed to find how practical portfolio management tools can be tailored to the interdependent decision making processes to increase portfolio management success.

From this literature review can be concluded that practical decision making tools can be tailored to the interdependent portfolio management processes by selecting a set of tools that positively influence the cultural factors and input generating processes that result in decision making success. The framework presented in Figure 12 shows what set of tools are expected to have this positive influence on decision making effectiveness. From this framework, some design propositions can be derived. The design propositions will be formulated according to the CIMO-logic, developed by Denyer et al. (2008). The CIMO-logic describes a problematic Context (C), for which the design proposition suggests a certain Intervention type (I), so that through specified generative Mechanisms (M), the intended Outcome can be achieved (O).

The context for all these design propositions is the multi-project environment of the FMCG industry where management experiences difficulties to allocate its scarce resources to an effective mix of projects. In these firms, innovation plays a moderate to big role in its business strategy. They however struggle to realize this strategy since mainly incremental development projects are selected by their current decision-making processes. With this context in mind, several interventions can be derived from the framework in Figure 12;
Insight 6; How can portfolio management tools be tailored to the interdependent decision-making process?

Practical decision making tools can be tailored to the interdependent portfolio management processes by selecting a set of tools that positively influence the cultural factors and input generating processes that result in decision making success. A bottom-up collectively created scoring model in combination with the top-down strategic bucket tool are selected to realise the optimal portfolio decision making, and therewith achieve a successful portfolio.

As these design propositions help to link the existing theoretic research base to practical situations in the field, they serve as a good starting point to compare the theoretical framework with real-life situations. These propositions therefore serve as input for data collection and empirical analysis at company A, which will be discussed in chapter 4. Chapter 5 will evaluate the empirical findings and find how the conceptual framework can be used to generate positive portfolio results at company A.

3.4 Conclusion

This chapter described the theoretical review, which helped to answer the sub-questions ‘What is portfolio management, and when is it successful?’ ‘What practical tools should be used to achieve portfolio success?’ ‘How do decision making processes interdependently influence the portfolio outcome?’ and ‘How can portfolio management tools be tailored to the interdependent portfolio decision making process?’. This led to the achievement of the first research goal; the development of a conceptual framework for the organization of the decision making process to achieve proficient portfolio management. The conceptual model results in propositions to consider in the empirical analysis of company A. This empirical analysis is described in chapter 4.

1. Evidence- & opinion-based decision making should be combined (I) so that both incremental and radical innovation projects will be selected (M) that enable creation of a high value, strategically aligned portfolio that is balanced and allows resources to work effectively (O).

2. The different functional areas should collaboratively determine the project selection criteria (I) to increase acceptance and understanding of the decision making process, which will benefit trust in cross-functional input (M) allowing for more effective decision making (O).

3. Specific budgets should be assigned to project programs in the form of strategic buckets (I) to ensure that the collective ambition of the program becomes the main platform driving all development activities (M). This will result in better cross-functional collaboration and thus better input generation for decision making (O).

4. A collectively created scoring model should be used to analyze projects, and projects should be arranged in programs by assigning strategic buckets (I), as this combination of tools leads to effective decision making thanks to its positive influence on the quality of evidence- and opinion-based decision input (see CIMO 2&3) (M), creating a harmonized achievement of all four portfolio performance indicators (O).
4 Empirical analysis

In order to create a suiting advice for company A, an empirical analysis is performed which answers sub-question 5: ‘How is portfolio decision making currently organized in company A?’. The empirical analysis was performed using two different approaches, both a qualitative and a quantitative approach. The qualitative approach yields valuable information from company documentation, interviews with company A’s employees, and observations. The insights from the qualitative analysis are used to map company A’s current decision making processes (paragraph 4.1) and to analyse and validate the business problem (paragraph 4.2).

In order to validate the causes of the business problem, the theoretical framework and its propositions are used to design a quantitative survey. The survey allowed to include the opinions of a larger group of employees, and helped to confirm the qualitative conclusion (paragraph 4.3).

4.1 Established decision making processes and protocols

Three data collection methods were used to map the current processes and evaluate its bottlenecks. The decision making processes and protocols were established by looking into company documents, conducting semi-structured interviews, and observing decision making meetings. Since project- and program management are closely related to portfolio management in a multi-project environment, the processes of all three management levels have been analysed. The current decision making processes and protocols, and its current participants are highly important for the selection of focus groups, discussed in paragraph 2.2.2.

4.1.1 Project management

At company A, a formalized project management process has recently been introduced. Their project management is organized according to the Stage-Gate® method. This means that every product development project passes through a consistent sequence of gates, and after each stage, a decision moment (gate) is planned to determine whether the project will receive resources to enter the next stage. Company A has defined the following stages; 1) idea, 2) definition, 3) Feasibility, 4) Development, 5) Launch.

In the project teams, the brand managers function as project managers. Together with their team, they ensure that the required actions are performed in each stage, and that a completed gate-document is handed to the gate-committee. In the first stages of development, the project teams mainly consist of Marketing and R&D representatives, sales is mainly involved in the later stages.

The gate committee mostly consists of the marketing director and the sales director. With the exception of projects that require production investments; in that case the full MT functions as the gate committee. At the gates, the project’s success is measured in terms of (expected) sales volume, sales contribution and intuition.

4.1.2 Program management

Company A has always been organized in brand teams. Projects were clustered in these brands and aimed to realise the brand promise. In that sense, company A has always had brand programs. In order to better meet retailer needs and align internal activities, a few years back company A introduced category teams. In these category teams, the marketing and sales departments cooperate and determine how the brand budgets can best be spend. These teams are subordinate to the brand teams, and seek to align the different brand plans within one category. Employees indicate that the category teams never received full support from higher management, and therefore there are no clear guidelines for the
activities and responsibilities of the category teams. Nevertheless, the teams have a positive influence on the marketing-sales cooperation.

4.1.3 Portfolio management

The company documents, interviews and meeting observations did not explicitly describe any portfolio management activities. The gate committee deals with decision making on an individual project level, and assumes that the brand and category teams have an overview and idea of the collective effect that is created by their project activities. The brand and category teams in turn indicate that higher management doesn’t give a clear strategic plan that they can follow.

In this decision making process, there seems to be nobody that monitors the collective effect of all projects together, and tracks whether the project development activities will help to bring the company closer to realising its objectives.

The R&D manager of company A does however keep an overview of the projects that are under development, and discusses his insights with the brand managers. This overview gives an idea of the work pressure and priorities, in addition to the relative resource allocation over the different projects. The activities of the R&D manager could be seen as a form of portfolio management, since an overview is kept over all development projects. Nevertheless, the insights from the R&D manager, and the overview he has, is not used for portfolio decision making on an organizational level.

With these decision making processes in place, company A indicates that they struggle to allocate their resources to the right combination of projects, and to set clear priorities in their product development activities. In order to ensure that the problem that will be addressed is indeed the main business problem rather than a perception problem or symptom, the company’s bottlenecks will be analysed and validated in the next paragraph.

4.2 Validation of the business problem

While mapping the current decision making processes, some bottlenecks of these processes came to light. In order to get a grip on the problems that company A is facing, a problem analysis was performed according to the stream analysis of Porras (1987). To start with, all problems that were mentioned in the interviews were transcribed all together (summarized in Appendix G). Following the stream method, these problems were grouped and interconnections were identified.

Based on the stream analysis, some problem stories can be described;

1. The decision making process of company A is very quantitative and output-driven, and decisions are made with a short-term reasoning. The focus on short-term output and quantitative factors, creates a portfolio that is overfull of incremental development projects and lacks highly innovative opportunities.

2. Company A does not have a clearly formulated innovation strategy that guides project selection. This makes that projects are not really filtered (all projects pass the gates), and priorities between projects are not clear. The lack of project filtering puts high work pressure on the human resources.

3. Company A has a complex organizational structure with many different contact points, decision making parties, and collaborations. The development departments have therefore developed different disciplinary subcultures. In combination with the lack of an overarching strategy, this makes that the departments pursue divergent goals and values. The lack of a collective ambition harms knowledge sharing and fosters an over-the-fence attitude. The result from this is that the development departments fail to collaborate effectively, which leads to rework in later stages of development, and can cause resources to go into firefighting mode.
4. Last but not least, the ambiguous communication and support from management is often mentioned as a bottleneck (mostly in relation to the category teams). Since management doesn’t seem to agree on important decisions, the employees do not receive clear guidelines that help them coordinate and focus their activities. An example is the category teams; the teams have been introduced, but category management has never been fully implemented in the organization since management couldn’t agree whether this was desirable. Company A therefore hangs in between brand and category management and employees are confused; should we pursue an objective and optimal category plan, or should we focus on building strong brands. The brands receive the budget, but the category should make the decisions? This phenomenon either leads to subjective category plans, or wounded brand plans, and will not help optimal performance the of brand nor the category.

To start with, the accuracy and recognisability of the problem stream was confirmed with senior management, the company supervisor, and the university supervisor. After that, the problem analysis was conceptualized by means of the literature review. From conceptualisation of the problem stream, it became apparent that the problems experienced by company A are frequently described in literature, and related to the lack of (proficient) portfolio management. Table 5 summarizes the problems and links the interview quotes (appendix G) to these problems. Additionally, some of the articles that describe similar problems are included in the table, and the organizational problems are related to the four portfolio objectives.

\[\text{Table 5: The problem stream related to interview quotes, existing literature & portfolio management objectives}\]

<table>
<thead>
<tr>
<th>Problem</th>
<th>Quotes</th>
<th>Described in literature</th>
<th>Problem mainly related to</th>
</tr>
</thead>
</table>
| 1. quantitative, short-term focus, mostly incremental development | 1,7,8,13,16,29, 31,49,58,59,63 | • Portfolio decision making genres: (Kester, Hultink, & Lauche, 2009)  
• Short-term vs long-term benefits: (Chao & Kavadias, 2008) | • Portfolio balance  
• Strategic alignment  
• Portfolio value |
| 2. Lack of strategy implementation, no focus, high workload for available resources | 2,3,4,5,6,14,15, 18,28,30,38,39, 42,43,44,46,48, 50,57,60 | • Overloaded resources lead to inefficiency: (Cooper, Edgett, & Kleinschmidt, 1999)  
• Lack of focus disables sound decision making: (Kester, Griffin, Hultink, & Lauche, 2011) | • Resource efficiency  
• Strategic alignment |
| 3. No collective ambition, rework and firefighting | 9,10,19,20,24, 25,27,32,36,47, 51,53,56,61,62 | • Firefighting resources: (Repenning, 2001) | • Resource efficiency  
• Strategic alignment  
• Portfolio value |
| 4. ambiguous management support and program management, subjective category plans | 11,12,15,17,23, 28,33,34,37,40, 41,44,45,54,55 | • Management support; a challenge for portfolio management: (Killen, Hunt, & Kleinschmidt, 2007)  
• Problems with subjective category plans: (Gruen & Shah, 2000) | • Portfolio value  
• Strategic alignment |

As the last column of Table 5 already indicates, the problems that company A experiences can be appointed to one overarching problem; poor portfolio management.

The literature review of chapter 3 presents a conceptual framework that can be used to proficiently implement portfolio management. Based on this framework, quantitative data is collected by means of a survey, to validate the causes for the lack of proficient portfolio management within company A. This validation of causes is discussed in paragraph 4.3.
4.3 Situation I; validation of causes

According to the conceptual framework that resulted from the theoretical review (Figure 12), the four portfolio objectives can be achieved by means of effective decision making. Since the qualitative analysis from previous paragraph concludes that the problem of company A is poor portfolio management, they are likely to score low on the achievement of the portfolio objectives. Based on the conceptual framework, it can be reasoned that this problem is caused by ineffective portfolio decision making.

In order to validate the causes of poor portfolio management at company A, a survey method is used which helped to attain a larger amount of input. The survey measured the opinion of the respondents by means of a five-point likert-scale; 1) I totally agree with this statements, 5) I totally disagree with this statement. Since the departments that are involved in the product development projects will have a founded opinion about the current decision making processes and the portfolio performance, the survey was send to all R&D, marketing and sales employees, including the higher management of these departments.

From 30 completed questionnaires and a response rate of 75%, the following average (factor) scores and standard deviations result:

<table>
<thead>
<tr>
<th>Table 6: Average scores and standard deviations that result from the survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio management objectives</td>
</tr>
<tr>
<td>High value portfolio</td>
</tr>
<tr>
<td>Strategic alignment</td>
</tr>
<tr>
<td>Resource efficiency</td>
</tr>
<tr>
<td>Portfolio balance</td>
</tr>
<tr>
<td>Decision making effectiveness</td>
</tr>
<tr>
<td>Portfolio mind set</td>
</tr>
<tr>
<td>Focus</td>
</tr>
<tr>
<td>Agility</td>
</tr>
</tbody>
</table>

Previous research has shown that best performing businesses score an average of 4 on similar 5-point likert scales (PDMA, 2012). However, none of the scores of company A get close to four. From this can be concluded that company A performs weakly on the four portfolio objectives, which confirms the qualitative conclusion; company A has a problem with portfolio management. Interesting to see is that management opinion differs quite a bit from that of the cross-functional employees, and that standard deviations are high. This indicates some confusion on whether the objectives are met. Additionally, management scores the strategic alignment of the portfolio quite high, while the portfolio value and balance are scored very low. This could indicate that the current strategy is not the right strategy (as is impedes achievement of other organizational objectives).

Also, in line with expectations from the conceptual framework, Table 6 shows low scores for the KPI of effective decision making (portfolio mindset, focus and agility) (Kester, Griffin, Hultink, & Lauche, 2011). Based on these low scores of decision making effectiveness, it is concluded that the lack of decision making effectiveness is the cause of the portfolio management problems.
4.3.1 Additional insights from the survey

In order to gain additional insight into the established project selection process of company A, the survey included questions on the project selection process. Moreover, respondents were asked to give their opinion on the cross-functional collaboration.

Table 7: Average scores and standard deviations on the project selection process and cooperation

<table>
<thead>
<tr>
<th>Project selection process</th>
<th>Average</th>
<th>St. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arla’s project selection method has clearly defined rules &amp; procedures</td>
<td>2,8</td>
<td>0,7</td>
</tr>
<tr>
<td>This method is consistently applied to all appropriate projects</td>
<td>2,6</td>
<td>0,8</td>
</tr>
<tr>
<td>Our current method is efficient</td>
<td>2,6</td>
<td>0,7</td>
</tr>
<tr>
<td>Our current method is effective</td>
<td>2,6</td>
<td>0,7</td>
</tr>
<tr>
<td>All projects are considered together (we compare them against each other)</td>
<td>2,8</td>
<td>0,8</td>
</tr>
<tr>
<td>I would recommend our project selection method to others</td>
<td>2,4</td>
<td>0,7</td>
</tr>
<tr>
<td>Arla uses a predefined set of criteria to evaluate and select product concepts</td>
<td>17% Yes, 48% No, 35% Don’t know</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross-functional cooperation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with our working relationship</td>
<td>3,0</td>
<td>0,9</td>
</tr>
<tr>
<td>The other departments fully carry out their responsibilities and commitments</td>
<td>3,2</td>
<td>0,8</td>
</tr>
<tr>
<td>The other departments respond well to feedback and advice from myself</td>
<td>3,3</td>
<td>0,7</td>
</tr>
<tr>
<td>The different departments cooperate efficiently to get the work done</td>
<td>2,9</td>
<td>0,9</td>
</tr>
<tr>
<td>Overall, our working relationship is successful</td>
<td>3,1</td>
<td>0,8</td>
</tr>
</tbody>
</table>

As can be seen in Table 7, the answers to these questions showed confusion about the current project selection method; nobody seems to have a clear idea whether company A uses a consistent method to select the projects, and whether predefined criteria are used. This shows that management doesn’t incorporate a transparent decision making process that enables employees to think along; transformational leadership doesn’t seem to be put into practice.

Employees clearly indicated to be dissatisfied with these project selection methods; they do not consider the method effective or efficient, and nobody would recommend the project selection method to others. The cross-functional collaboration, which is one of the important input generating processes for quantitative decision making (Figure 9), is also scored low by the survey respondents.

Given that company A scores low on cross-functional collaboration, transformational leadership, and collective ambition, the conceptual framework of chapter 3 seems to be applicable for improving portfolio management practices at company A. The next chapter will therefore evaluate how organizational practices should be changed according to the framework, and how the solution could be further personalized to the preferences of the company.
4.4 Conclusion

The empirical analysis that is described in this chapter answered the sub question ‘How is portfolio decision making currently organized in company A?’ Both qualitative and quantitative analysis show that company A experiences challenges to achieve the four portfolio management goals: high portfolio value, portfolio balance, strategic alignment and resource efficiency (Cooper, Edgett, & Kleinschmidt, 1998). The achievement of these goals seems to be impeded by the ineffective decision making process that is currently in place at company A. For example, projects are selected based on quantitative and short-term oriented decisions which mostly leads to incremental new product development. And company A lacks strategic focus in its decision making, which exerts pressure on the resources. The ineffective decision making seems to be nurtured by the absence of a collective ambition, transformational leadership, and good cross-functional collaboration.

In chapter 5, the evaluation of the empirical analysis will be discussed, where the current organization of portfolio management will be compared to the propositions of the new conceptual framework.
5 Evaluation

From the empirical analysis it became clear that the struggles that company A experiences with its portfolio management are caused by ineffective portfolio decision making processes. To find out how company A can improve its processes, the current organizational processes are evaluated by comparing them to the design propositions which resulted from the conceptual framework in chapter 3. This comparison is discussed in paragraph 5.1, which results in answering the question: ‘what are the strengths and weaknesses of the current process?’ The strengths and weaknesses of the current process help to articulate suggestions to adjust company A’s processes (paragraph 5.2). In order to maximize usability of the final solution, these suggestions were discussed within company A. The results of this discussion are presented in paragraph 5.3, which answers the sub question: ‘what are the organizational preferences and insights for improving the process?’

5.1 Strengths and weaknesses of the current process

To find out how company A can improve its processes, it is evaluated how the current processes differ from the conceptual framework’s design propositions (Table 8).

<table>
<thead>
<tr>
<th>Area</th>
<th>Framework proposition</th>
<th>Current process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decision making process</td>
<td>Combine evidence- &amp; opinion based decision making.</td>
<td>Quantitative/power-based decision making.</td>
</tr>
<tr>
<td></td>
<td>&gt; Result: Both incremental and radical innovations can be selected.</td>
<td>&gt; Result: Misbalanced portfolio, overloaded with incremental projects, and a total lack of focus.</td>
</tr>
<tr>
<td>2. Cross-functional trust &amp; collaboration</td>
<td>Development departments collaboratively determine the project selection criteria.</td>
<td>Different disciplinary goals.</td>
</tr>
<tr>
<td></td>
<td>&gt; Result: Increased acceptance and understanding why each other’s input is important, will benefit trust and collaboration.</td>
<td>&gt; Result: Under-average collaboration which leads to inefficient work and incomplete input for decision making.</td>
</tr>
<tr>
<td>3. Program management</td>
<td>Assign specific budgets to the project programs in the form of strategic buckets.</td>
<td>Ambiguous program organization; try to implement category management, but there is a lack of guidelines and company A sends mixed messages by assigning brand budgets.</td>
</tr>
<tr>
<td></td>
<td>&gt; Result: The program becomes the main platform that influences all decisions. Resource expenses are aligned with strategy. Focused effort will increase performance.</td>
<td>&gt; Result: Confused employees. Compromised plans lead to the inability to flourish on brand nor category plans.</td>
</tr>
<tr>
<td>4. Transformational leadership</td>
<td>The decision making tools should express transformational leadership by encouraging people to think strategically and incorporating a transparent decision making process.</td>
<td>No clear selection method or selection criteria.</td>
</tr>
<tr>
<td></td>
<td>&gt; Result: The quality of decision making input for both evidence- and opinion based decision making will increase. Lower chances of politics.</td>
<td>&gt; Result: Confusion about the input that is required for the gate committee. Gate committee receives gate documents that contain too much information which is not used for decision making. Nobody is satisfied with the current project selection process.</td>
</tr>
</tbody>
</table>
As becomes apparent from Table 8, there are quite some differences between company A’s processes and the optimal processes outlined by the framework propositions. Next, these differences and weaknesses will be evaluated in more detail, and strengths will be described.

5.1.1 Decision making process
The first design proposition that resulted from the conceptual framework indicates that a successful portfolio asks for a combined use of evidence- and opinion-based decision making processes, so that both incremental and radical innovation opportunities can be selected. However, the outcomes of the empirical analysis show that the decision making process of company A is typified by quantitative- and sometimes even power-based decision making; projects are selected based on their sales volume and profit margin, or as one of the members of the gate committee said, based on ‘a feeling’. This is a weakness of the current portfolio management process of company A; in order to achieve a successful portfolio, company A should incorporate more opinion-based decision making processes in addition to its existing evidence-based processes.

5.1.2 Cross-functional collaboration and trust
The second design proposition states that development departments should collaboratively determine the project selection criteria to increase acceptance and understanding of the decision making process, which will benefit trust in cross-functional input allowing for more effective decision making (Pritchard et al. 2002; Kleingeld et al. 2004; Kester et al, 2011). To start with, the survey results of company A showed that the development departments do not accept nor understand the current project selection method, and it is unclear for them what input is required to foster sound decision making. Additionally, the collaboration between the departments isn’t perceived to be good. This lack of good collaboration and trust in each other’s input impedes company A from realising effective decision making (Kester, Griffin, Hultink, & Lauche, 2011).

5.1.3 Program management
The conceptual model also proposes that specific budgets should be assigned to project programs in the form of strategic buckets to align expenses to the strategy and ensure that the collective ambition of the program becomes the main platform driving all development activities. In line with this proposition, Company A introduced category programs. However, due to low management support the program teams receive too little guidelines. In addition, company A sends mixed messages by assigning brand budgets to the category programs, which creates confusion about who or what should lead the development activities.

5.1.4 Transformational leadership
The conceptual framework indicated that transformational leadership could be seen as a prerequisite for achieving portfolio success. The decision making tools should therefore express transformational leadership by encouraging people to think strategically and incorporating a transparent decision making process. The quality of decision making input for both evidence- and opinion based decision making will then increase, while lowering chances of political influences (Kester, Griffin, Hultink, & Lauche, 2011).

The processes of company A show a weak spot in this area: the current decision making process of company A does not include a clear selection method or selection criteria. This creates confusion about the input that is required for the decision moment at the gates. The gate committee therefore receives superfluous information in the gate documents which are used as input for the decision making. The current project selection process is unable to satisfy any of company A’s employees.
5.15 **Strengths**

The evaluation in Table 8 indicates multiple weaknesses of *company A*’s current processes, but also some strengths of the current process can be identified. First of all, *company A* has incorporated a formalized project management process by following the Stage-Gate® method. The regular scheduling of the gates allow for consistent and frequent revision of the portfolio (by means of the collectively created scoring model), and therefore forms a strong basis for implementing the suggested portfolio management tools. Second of all, *company A* has introduced category teams through which the company aims to align its product offerings to the needs of the retailer and its shoppers. Although the program management of categories is not consistently implemented and thereby the functionality of these category teams is somewhat inhibited, the existence of the category teams forms a good basis for portfolio management by implementing the strategic bucket tool.

_Insight 8: What are the strengths and weaknesses of the current process?_

The formalized project management process allows for frequent and consistent revision of the portfolio composition. However, the decision making process at the gates is too much reliant on evidence-based input and creates confusion due to its lack of transparency. The existence of *company A*’s category programs shows potential for cross-functional collaboration and strategic alignment, but fails to realize this potential because of its inconsistent implementation and questionable management support.

5.2 *Suggestions to adjust company A*’s processes

Based on the strengths and weaknesses which are presented in the previous paragraph, some suggestions can be formulated to adjust *company A*’s process in order to enable more effective decision making and realise a successful portfolio.

First of all, *company A* should create clear development programs that are implemented unambiguously so that program managers and the program team have a clear guideline for realizing the program strategy. As became clear from the literature review, this can be achieved by assigning personal budgets to these programs (Milosevic, Martinelli, & Waddell, 2007). In the FMCG industry, it makes sense to use brand programs or category programs, since product development projects within one brand- or category use the same resources while having overarching goals to pursue. To maximize the strategic alignment of the portfolio, resource expenditures are advised to be further defined within each program. This can be done by defining how the categories should divide its efforts over the existing brands, how the brands should divide its time over different project types (i.a. cost savings, innovation, line extension), etc. The creation of strategic programs, and division of the program budget into strategic buckets can thus be done in multiple ways. Some possible scenarios for *company A* are therefore described next.
Also the budget that is assigned to the programs and the buckets can differ in nature. The budget could for instance comprise money, but also man-hours or specific personnel can be dedicated to a program (bucket). Additionally, the budget could be meant for different purposes; should the budget be used for marketing expenses, for production investments, for R&D expenses, or should they cover all costs connected to the projects?

Second of all, company A should introduce a consistent and transparent decision making process that can be used to evaluate projects at the gates. The consistency of the method will ensure grounded decision making and will prevent politics to influence the decisions. Transparency will benefit quality of the decision making input. To maximize transparency and enhance cross-functional trust and collaboration, the decision making criteria should be determined by the development departments. The collective creation of a scoring model will most likely lead to formulation of both evidence- and opinion-based criteria, which is just what company A needs to improve its current activities and incorporate more innovative projects in its current portfolio. Although this suggestion for changing the decision making process seems quite straight-forward, also multiple scenarios exist in this case. The type of criteria and scoring factors that measure a project’s potential do not only differ per company, it can also differ per project type or project stage.

Resulting from the two suggestions described in this paragraph, implementation of strategic clusters and a collectively created scoring model can be dealt with in several ways. What exact solution would work best for company A is very personal; it depends on their own preferences and insights on how the solutions could fit in the daily activities (Martinsuo, 2012). Therefore, company input is collected by means of two focus group sessions. How these sessions were organized and what the outcome was, will be discussed in the next paragraph.

5.3 Organizational preferences and insights for adjusting processes

To be able to conclude this research with a realistic and personalized guide, the input from company A about what scenario/process would fit the company best is considered important. Therefore, two sessions were organized that helped measuring the reaction of the attendees on the proposed solution, and to further specify the decision making tools (Table 9). In order to specify the top-down tool, a session was planned with higher management, discussing how to implement the strategic buckets; how would this fit within company A? What are the advantages and disadvantages of the different scenarios? What programs and what buckets can we identify? To specify the bottom-up tool, a delegation of the development departments was gathered in a meeting. Here, it was discussed what criteria and scoring factors would be suitable to indicate a project’s potential, and how they would see this tool implemented in the organisation.
Table 9: Summary of the organized input sessions

<table>
<thead>
<tr>
<th>Session</th>
<th>Attendants</th>
<th>Discussed</th>
<th>Intended outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management session</td>
<td>R&amp;D manager, Marketing director, Sales director, Operations director, Business integration director</td>
<td>Top-down strategic bucket tool.</td>
<td>Clear opinion about the different scenarios to find out what scenario would best suit company A and why.</td>
</tr>
<tr>
<td>Cross-functional</td>
<td>2x Brand manager (marketing), Account manager (sales), Trade marketer (sales), 2x Product developer (R&amp;D)</td>
<td>Bottom-up scoring model.</td>
<td>A first impression of what criteria and scoring factors should be included in the scoring model.</td>
</tr>
</tbody>
</table>

5.3.1 Management input

For the management session, the insights from the empirical analysis were presented in order to indicate the urge to work on a better portfolio management method. Thereafter, it was explained how the suggested solutions could help company A to achieve this.

The presentation of the low survey scores nourished a discussion amongst the management team about the current state of affairs. After a while, this discussion lead them to conclude that company A doesn’t have a clearly formulated strategy, that they are indeed only focusing on the short-term results, and that there would be a need to change this and follow a longer-term path. Although this discussion shortened the remaining time to discuss the scenarios, it was considered quite important as it created management awareness, openness to talk about the problems, and willingness to work on a solution.

Possible scenarios for company A to improve current state of affairs were summarized and visualized in a hand-out to support a discussion about concrete possibilities. Attendants were encouraged to have an open discussion about the different scenarios and to give their viewpoint on the strengths and weaknesses of these scenarios. The scenarios addressed different possibilities for program management (brand or category), possibilities to define the buckets (brand, category or project type), and different budget definitions (money, man-hour or R&D employees dedicated to a specific program).

The fact that company A didn’t have a strategy made it difficult to discuss the benefits and bottlenecks of the different scenarios. After all, the scenarios are highly dependent on the strategy; the program and bucket distribution should reflect the strategy. Although the lack of strategy asked for the discussion to be a bit more abstract and hypothetical, it did lead to some clear insights into what solution would work for company A. Table 10 summarizes the conclusions.
Interesting to see is that management clearly had trouble to determine whether the categories or brands should represent the strategic programs. As they stated, both are evenly important and not one of them should be leading decision making more than the other. Although they finally leaned more toward the category programs, ‘because that is how we currently have organized our activities’, the struggle to determine the leading platform is reflected in their current process; brand teams who determine the category plans. Although both brands and categories are important, the lack of one leading platform currently impedes performance. Employees are confused about what should be leading their decision making and fall back into old habits; the brand thinking. Category management is however not likely to succeed when the brand/category conflict leads to opportunistic behaviour where the own brands are unfairly favoured over other category products (Gruen & Shah, 2000). In order to succeed in category management, company A will have to commit to delivering objective category plans that are not influenced too much by their own brand plans. The opportunity to build brands should still be influencing product development, but should be subordinate to the category plans. How company A can deal with the brand/category conflict will be further discussed in chapter 6.

For the bucket distribution, company A unanimously chose the project type option. Management mentioned that this option would help to safeguard long-term plans, it will show the relative importance of the different projects, and it will be inspiring for employees to see that also the (currently neglected) cost saving projects are highly appreciated and help to achieve greater objectives. Additionally, it would help to give guidelines to empowered people.

The fact that R&D currently keeps track of the hours they spend on specific projects was not known to all management attendees. The resulting time distribution is currently a ‘coincidence’, and management agreed that this could be approached more proactively. The predefined strategic buckets allow for this proactive approach of resource distribution.

While taking the input of management into account, the step-by-step guide in Chapter 6 will explain in more detail how company A is recommended to implement the strategic bucket tool, based on theoretic and empirical insights. First, the results from the cross-functional session are presented in the next paragraph.

### Table 10: Summary of management input

<table>
<thead>
<tr>
<th>Scenario level</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program</td>
<td>Management clearly had trouble to determine what should be leading their product innovation; brand or categories. Both brand and category were considered important, and would both have to be stimulated by the assigned strategic buckets. Since the organization currently uses category teams, these teams could represent the main programs, but the organization should not lose sight of building brands.</td>
</tr>
<tr>
<td>Buckets</td>
<td>The possibility to further define how the program budgets would have to be spend was perceived useful. Mainly because the organization struggles with development of long-term plans, the earmarked buckets for project types could help them to ‘plant some innovation seeds and protect the plans from short-term distractions’.</td>
</tr>
<tr>
<td>Budget definition</td>
<td>The way that the budget can be defined has not been addressed in the focus group. Therefore, some of the attendants were contacted later to discuss this matter. Since the R&amp;D department already keeps track of the hours spend on a given project, it would be easy to link the hour registration to project type or to the programs. Additionally, working hours is expected to give the employees a better impression of relative effort than money does.</td>
</tr>
</tbody>
</table>
5.3.2 Departments input

In order for a scoring model to have a positive effect on the portfolio outcome, the scoring model should include all important aspects that influence the potential success of a project. After all, what you measure is what you get (Pritchard, Paquin, DeCuir, McCormick, & Bly, 2002). Since the different departments have different viewpoints on what aspects would influence a project’s success, for the specification of the bottom-up tool a session was arranged with a delegation of the development departments; sales, marketing and R&D. The attendants of this session were selected due to their position as key opinion leaders of their departments so that a comprehensive model could be build that supported all viewpoints. The aim of focus group this session was to collectively create a scoring model to find out what criteria should be included, and how these differed from the current selection criteria.

At the beginning of the meeting, some of the survey results were presented. All the attendants could relate to the low scores and the mutual agreement on what was going wrong created cohesion in the group. This was a good starting point for the active part of the meeting; the collective creation of the scoring model. In order to foster exchange of opinions and to come to consensus on the final model, the meeting was set up according to Pritchard et al.’s Performance Management and Enhancement meetings (2002). Therefore, the meeting was arranged according to the following meeting requirements:

- Face-to-face discussion is one of the key features that will enhance the success of the scoring model. Different views broaden the perspective of the team members and makes for a better system.
- Every aspect that is of importance should be included in the model; what you measure is what you get.
- The model normally would contain around 3-6 main criteria. And each criteria should be scored by 1-5 factors.
- Everyone should agree on the final model.

Given the limited amount of time, this ‘test run’ only aimed to determine the main criteria and scoring factors that should be used for radical innovation projects. The main criteria should be formulated in such a way that, when the project meets these criteria, it will have an increased chance on success. Examples of main criteria are; technical feasibility, market attractiveness, risk vs return, etc. (Cooper & Edgett, 2001). Scoring factors are indicators that measure how well the project performs on the main criterion. Innovation projects were taken as the starting point as these project types are expected to require the most extensive list of scoring factors.

After the difference between criteria and scoring factors was explained, the group was invited to individually write down what they think should be the main criteria of the scoring model.

The different attendees from R&D, marketing and sales shared their insights and had an open discussion on what they considered to be important criteria to implement in the model and why. Initially, this resulted in a large list of criteria (Appendix H). But by means of an open dialogue the team was able to distil the list to four essential criteria. These four criteria then formed the basis of the model. The team then discussed what scoring factors would best be used to measure achievement of these criteria. The resulting scoring model is displayed in Figure 14.
Interesting to see is that the model that resulted from the test meeting contains quite some criteria that have not yet been influencing the decision making. Currently, the main driver for decision making is the sales contribution and the expectation of sales volume. But according to R&D, marketing and sales, project potential depends on more than the business case alone; the ease of implementation, strategic fit, and commercial potential should also influence project selection and prioritization. Thanks to the combined expertise of the participants, the scoring model can be used to approach a project’s potential from different viewpoints; what is the sales potential, what about the commercial possibilities, is there synergy with the current production capabilities, etc.

As the creators of this model already mentioned, the scoring model might differ across gates; the first gate might ask for less detail than the last one, or even score on different factors (Bitman & Sharif, 2008). It is therefore important to see the scoring model in Figure 14 as a starting point, but not as a definite model. Company A should consider whether this model would have to differ across project types or gate moments, and how. How company A can further develop the scoring model tool will be explained in more detail in chapter 6.

**Insight 9: What are the organizational preferences and insights for improving the process?**

The input sessions showed that company A’s management agreed on the urge to implement suggested tools; the strategic buckets and the scoring model. In terms of programs, management has problems to determine whether brand or categories should be the driving force behind new product development. Eventually, they decided that they prefer to build further on the category organization, but take the brands into account at the same time. They unanimously agreed that the buckets should be assigned to project types, mainly to safeguard innovation efforts. The scoring model created by the cross-functional team shows that the departments would like the model to include both opinion and evidence-based decision criteria. Additionally, both internal value and external value creation should influence the decision. They did indicate that the appropriate scoring model might change per project stage and project type.

5.4 Conclusion

When comparing the decision making process of company A with the conceptual model that has been created earlier, it becomes evident that company A has many weaknesses in its decision making organization. These weaknesses impede portfolio success and overall organizational performance. It is therefore suggested that company A will implement a collectively created scoring model and a strategic bucket tool to enable effective portfolio decision making. Since these tools can be applied in different ways, preferences and insights of higher management and the development departments were gathered by means of two focus group sessions.
In a focus group session with higher management it became clear that management is aware of the current deficiencies, and is open to implementing the scoring model and strategic bucket tool. Although it was difficult to speculate about the strategic buckets while there was not yet a strategy, management did agree unanimously that the buckets should be allocated to different project types so that larger innovation projects would be safeguarded. They had more trouble to agree on the program specification, but finally decided that category programs would be the best option given the current organization of development activities.

The cross-functional team reached consensus on the scoring model. The model contained both evidence- and opinion-based factors, as well as internal- and external value creation. The exact composition of the scoring model could however differ per project stage and project type.

The company’s input is considered to be very important to personalise the advice and make it ready for implementation at *company A*. Therefore, this input will be considered, together with insights of the theoretical- and empirical analysis, in order create a step-by-step guide for implementation of portfolio management. This guide will be discussed in chapter 6.
A step-by-step guide for portfolio management

As discussed in the introduction of this research, the aim of the empirical analysis was to create a step-by-step guide for company A that supports the proficient implementation of portfolio management. This chapter presents an abstract of the step-by-step guide for the organization of the portfolio decision making process at company A. By means of this guide, weak points that were identified in the evaluation from previous chapter, will be addressed. Therewith, this chapter answers the last sub-question: ‘How can company A implement a more proficient portfolio management process?’.

In line with the conceptual framework that was developed by means of the theoretical review, it is recommended to implement a top-down and bottom-up decision making tool, which will ensure effective decision making throughout all management levels of the multi-project environment at company A. In order to create a clear and applicable guide on how these two tools can be implemented, its content has been carefully composed. By linking the advised tools to the current organizational processes, giving relevant examples, and providing meeting guides, the guide has been made practical and user friendly. Given the confidentiality of this project, and the desire to make the guide very personal, the guide has been a separate deliverable of this research project. However, to give an idea of how the guide is structured, what its content is, and how its applicability has been guarded, a short overview will be given in the following paragraph.

6.1 Implementation plan
The guide consists of two main parts. In each part of the guide, one portfolio management tool and guidance for its implementation is presented. Part one discusses the implementation of the top-down tool; strategic clusters (or buckets). The strategic cluster tool will help company A to spend the resources in line with the innovation strategy, and therewith create a more balanced portfolio. Implementation of this tool consists of three main steps. Table 11 summarizes these steps along with an explanation of their importance.

After strategic choices have been made by higher management, they can be put into practice by the development departments. The development departments will decide what the strategic aspirations mean on a more operational level. For instance; What sub-goals can we formulate that will contribute to the innovation objective? (Part 2, Step 1), What projects will potentially help us to realize the innovation strategy? (Part 2, Step 2&3). Part two therefore presents the bottom-up tool, where decisions will have to be made on program and project level (Table 11).

How company A can implement these two tools within the organization is explained in a step by step manner, and at each step, a meeting guide is provided that can serve as a support to make the necessary decisions. The meeting guide contains support for decision making by summarizing significance of the particular meeting, the meeting goal, suggested attendants, requirements, meeting outcome, follow-up and meeting frequency. Table 11 summarizes the implementation steps along with explanation of their importance. These steps are shortly discussed in separate subparagraphs in this section. In order to get an impression of how the extensive step-by-step guide was structured, the meeting guides of all steps are included in Appendix I. The third step (paragraph 6.1.3) is presented more elaborately, since this provides insight in the level of detail of the step-by-step guide. This step was selected as it contains no company critical information.
Table 11: Subjects discussed in the guide

<table>
<thead>
<tr>
<th>Part 1: Creating strategic clusters (Top-down)</th>
<th>Part 2: Proficient project selection (Bottom-up)</th>
</tr>
</thead>
<tbody>
<tr>
<td>§6.1.1 Step 1: Formulate the innovation strategy</td>
<td>§6.1.4 Step 1: Formulate the program strategy</td>
</tr>
<tr>
<td>To realize long-and short-term value creation, a point on the horizon is needed to align today’s efforts with tomorrow’s goals.</td>
<td>To bridge the gap between the strategic nature of the portfolio and the operational nature of development projects.</td>
</tr>
<tr>
<td>§6.1.2 Step 2: Create strategic programs</td>
<td>§6.1.5 Step 2: Collectively create a scoring model</td>
</tr>
<tr>
<td>Programs help to maintain overview over the collective effect of single projects and prevents the scatter-gun effect.</td>
<td>Fosters acceptance and understanding of the decision making process and will benefit input quality for both evidence- and opinion-based decision making.</td>
</tr>
<tr>
<td>§6.1.3 Step 3: Earmark the program budgets</td>
<td>§6.1.6 Step 3: Select and prioritize projects</td>
</tr>
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<td>Ensures that resource expenditures are aligned with the strategy so that long-term efforts will not be distracted by short-term opportunities.</td>
<td>Guard resource efficiency and only assign resources to the truly deserving projects.</td>
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</table>

6.1.1 Formulate the innovation strategy

From the input session with higher management of company A, it was noted that the company doesn’t only have trouble to implement a long-term strategy, there appears to be a lack of strategy. When company A wants to realise a successful portfolio is should therefore first formulate an innovation strategy (Yalabik, Howard, & Roden, 2012). An innovation strategy is a plan of how to use the development of new products to achieve certain objectives. There are many different innovation drivers that can be taken as input for the strategy. For example, the goal to fulfil the brand’s promise, the need to keep up with competitors, the desire to be the preferred supplier, the potential of a new market segment, or the aim to leverage from a new technology. These drivers can be translated into objectives and strategies. For instance, if technology would be the main driver for innovation, the objective could be to benefit as much as possible from the investments made in new (production) technologies. The innovation strategy that takes this driver as an input could be: we use the technology as a platform for innovation, on which we can base many products for different markets.

All the drivers mentioned above can be translated into objectives and a related innovation strategy. They are all a possible reason for innovation, and therefore should all be taken into account. However, none of the drivers specifies how you should react on them, rather they function as an impulse. The way you react on this impulse depends on what innovation strategy you choose.

Currently, company A doesn’t have a clear innovation strategy and seems to be stuck in the middle. By introducing category teams, company A aims to build a good relationship with its retailers. However, the category plans are shaped by the brand strategy, which leads to a suboptimal category plan or wounded brand strategies. The marketing and sales departments are confused by this double-faced strategy, not knowing whether the brand plans or the category plans should be leading their idea generation and decision making. The management team should therefore formulate a clear innovation strategy that will allow company A to flourish either on brand equity or on retailer relationship. Both options have advantages and disadvantages, but the category driven innovation strategy represents the highest possibility of success.
Choosing a brand driven innovation strategy would mean that the main focus is to build brand-equity (Kotler & Keller, 2008). Creating brand-equity requires high marketing expenses to secure a positive position in the mind of the consumer (Urde, 1999). This marketing effort is however likely to be offset by the strength of company A’s main competitor. This competitor is likely to react on company A’s brand building by enhancing its own marketing. If this ‘brand-equity war’ would indeed start, company A will be the weaker candidate since the competitor is able to make higher marketing expenses and even accept losses over a longer period of time.

When company A would focus on generating another intangible asset, retailer trust, it will have a stronger starting position. Company A will be able to build upon the close ties that it already has with several retailers. Thanks to the fact that all development disciplines are housed at the same location, different insights and expertises can be combined into an optimal category plan for the retailer. With the category teams in place, company A already has the basic organizational structure, where it can continue to build on. If company A dedicates to analysing the market and creating objective category plans, advising the retailer and forming a category vision, this will ultimately lead to a good manufacturer-retailer relationship, implementation of the category plan, and increase in sales (Aastrup, Grant, & Bjerre, 2007). In order to realize this, company A will have to formulate an unambiguous strategy that can serve as a clear guideline for development activities. Appendix I presents a meeting guide that serves as a support for formulating a clear innovation strategy.

6.1.2 Create strategic programs

The innovation strategy should be supported by aligning resource allocation and program management to the achievement of the strategy. Clustering projects into programs is needed to overcome the fragmentation that is caused by autonomous projects, so that the innovation strategy can be achieved by monitoring the aggregated effect of the single projects. The program strategy provides the program managers with an actionable handheld that bridges the gap between the strategic nature of the portfolio and the operational nature of development projects (Milosevic, Martinelli, & Waddell, 2007). Strategic alignment of the programs with the portfolio is best achieved when the projects in one program have shared resources at their disposal, so that the program becomes the main platform that influences NPD decisions (Buuren, Buijs, & Teisman, 2010). Therefore, company A is recommended to assign personal budgets to the different programs, so that the programs can accomplish strategic objectives that would not be taken into consideration by separately working project managers. The size of the allocated budget allows for differentiation in strategic importance of the relative programs.

In order to perform a category-driven innovation strategy, category programs should be formed which strive to create the optimal category plan for company A’s retailers (Figure 15). As management indicated in the input session, they want to implement category management without losing the brand building out of sight. To realise this, the category programs represent the opportunity to combine the expertise from marketing, R&D and sales into an optimal category plan. Marketing can approach the category plan from a brand perspective; how do we preserve the brand vision? Sales can provide input on retailer requirements, competitor performance and PL requests. Although R&D hasn’t been fulfilling an active role in company A’s current category teams, they could prove to be a valuable link between category requirements and the current production capabilities and development competences. Thus within the category programs, sales will have the main responsibility to create an objective category plan for the retailer. Marketing and R&D will support the creation of an optimal product mix by presenting opportunities from a brand and development perspective.

Since the category programs ask for brands to develop a brand image while building an optimal category product mix, a multi-layered structure will arise. In order to manage these multiple layers, visualization
of the current situation can help to envision opportunities on how this situation can be optimized. An overview of the current category composition will help to signal new category opportunities and an overview of the brand collection allows marketing to see how the different brands could react on arising category opportunities.

**Budget definition**

With the marketing budget that is currently provided to the brand managers, the development employees perceive projects that do not require marketing or production investment as ‘free’ projects. In order to create awareness on the fact that these projects also take time and therefore go at the expense of other projects, the program budgets should be used for more than only marketing purposes; *company A* should introduce a development budget. In the development budget, development time is also considered as a cost. These development budgets can be defined in different ways (man-hours, euro’s). Given *company A*’s current administration and line of reasoning, management indicated that they would prefer to define the marketing budget in Euro’s and the awarded development time in man-hours (Figure 15). This means that category X for instance receives 10,000 hours of development time for upcoming year. R&D can then book 10,000 hours on category X-related development activities. This would be a good budget division as it gives R&D freedom to decide how they develop their expertises and thus who is assigned to what project. Currently, the R&D department already keeps track of the hours spent on a specific project, which forms a good and logic basis for implementation of this hour-budget.

The assignment of a development budget has the following advantages for *company A*:

+ Awareness is created on the costs of development
+ Ability to guard the pressure on R&D; only a realistic amount of hours is allocated
+ The resource allocation truly reflects portfolio priorities, and therefore is not an accidental output
+ By clarifying the cost of development, a realistic productivity assessment can be made; if one project takes less development effort but generates the same return, it should have priority over a project that takes more development effort.
+ The development budget will require the departments to cooperate in an early stage, since the programs should have a clear idea of how much development effort a given project needs. Thus, how many projects they can include in their program plan, given the budget that they have.

The meeting guide for project selection and resource allocation is included in Appendix I.

6.1.3 **Earmark the program budgets**

*Company A*’s current product development projects are selected by following a sort of ‘first come first serve’ method. Additionally, the projects are selected based on evidence-based decisions. This makes the portfolio misbalanced; it contains many small, short-term projects, while few radical innovations or big bets are under development. In comparison to minor product extensions, radical innovation efforts are more risky and require a window of time in order to realize positive outcomes. Therefore, radical innovation projects are not naturally selected for development.
Having a mix of radical and incremental product development efforts is however strongly linked to organizational success; creating a balanced portfolio is prerequisite for company A to have a successful portfolio that is strategically aligned, creates high value and ensures resource efficiency (Kester, Hultink, & Griffin, Forthcoming). It is therefore advised for company A to determine upfront how it would like to spend its resources over different types of projects. Looking at the projects that have been performed in the past two years, all of company A’s product development projects can be classified by the following four project types: Line extensions, Innovations, Maintenance & Improvements, and Cost savings. By predestining resources to these project types, company A will reassure that each project type receives the necessary attention (Chao & Kavadias, 2008). The significance of each project type might differ per program. Company A should therefore determine how the category budgets must be allocated across these project types (Figure 16).

As feedback loops [C] and [D] suggest, the budget distribution can be visualized so that potential portfolio imbalance is recognized in an early stage, and the budget distribution can be adjusted when the expenditures tend to be out of line with the innovation strategy. As an example, Figure 17 visualizes the budget distribution of one of the categories, and how the budget has so far been spend. The light grey shows the budget spend, the dark grey reflects the available budget. By visualizing the expenditures, the program manager can recognize that the category might have to put some more focus on possibilities for cost saving projects. In this way, idea generation can also be steered to achieve development aspirations.

Advantages of earmarked budgets;
+ Defined budgets will decrease competition amongst plans and therewith ensure that (long-term) plans do not go at the expense of (short-term) distractions.
+ Resource allocation will truly reflect strategic aspirations.
+ The product development departments will be able to specify the program strategy per project type; ‘realize 10% savings in category X by realizing lower cost prices of the products’.
+ Clear communication of how company A would like to spend its resources will steer idea generation; it is clear for the program teams what is important for company A.
+ By making the project type partitions, it is no longer necessary to compare very different types of projects (cost saving projects are hard to be compared to innovation projects). The different project types can now have their own project selection criteria.

To offer support and guidance for earmarking the budgets at company A, a meeting guide is included in the step-by-step guide (Figure 18).
Meeting guide: Earmark the program budgets

Necessity:
> Due to the high pressure to generate positive returns, company A has developed a short-term focus where longer-term projects are postponed to realize the short-term possibilities.

> Predefining budget allocation to different project types will help to define the amount of attention these projects require, and will safeguard these aspirations; defined budgets will decrease competition amongst plans and therewith ensure that long-term plans do not go at the expense of the short term.

> The misbalance in the portfolio of company A (as a result of short-term focus) impedes company A to realize long-term value creation and strategic alignment. The pressure that resources experience as a result of the high amount of short-term pressure-projects, and the rework that results from that hinders organizational efficiency.

> The budget distribution will help program managers to formulate more detailed action plans.

Questions to answer:
> What project types can be distinguished?

> How important are the respective project types within each program?

> What proportion of the program budget should be available for each project type? How important is radical innovation in this category? How much attention do we spend at cost savings, etc.

Meeting goal:
Specify how the program budget should be divided over different project types to assure realization of long- and short-term strategic aspirations.

Suggested attendees:
Given the strategic impact of the earmarked budgets and the need to align aspirations of the different programs, this decision should be made by higher management. It is required for management of the development related departments (R&D, Marketing, Sales & Operations) to agree on budget distribution, it is optional to involve the other MT members.

Requirements:
In which category do we want to expand the available product ranges by means of radical innovation? In what category is focus more on keeping the current offering up-to-date by means of incremental product development? These are questions that should influence the budget ratio across the project types. Management should take into consideration the internal needs (cost saving, research, maintenance, etc.) as well as external circumstances (market growth, innovation opportunities) when allocating the budgets to the programs.

Meeting outcome:
The meeting concludes with predefined expenditures of the program budgets, which represent the strategic aspirations.

Follow-up:
The budget distribution should be communicated to the program teams so that they can formulate action plans. Higher management should clarify the reasoning behind the budget distribution to increase acceptance. To remain focused and achieve the long-term innovation objectives, it is crucial for management to support and defend the budget distributions when they are challenged.

Meeting frequency:
The predefined budget allocation can be discussed bi-monthly together with the program budgets.

Figure 18; A page from the step-by-step guide; meeting guide for earmarking program budgets
6.1.4 Formulate a program strategy

The management team will communicate to the program teams what their budget will be for upcoming year, and how they would like this budget to be spend with regards to the different project types. The budget allocation provides the programs with a clear guideline on how they could contribute to realization of the innovation strategy. The program team therefore formulates a program strategy on how they will indeed contribute to the innovation strategy, given the budgets they have received.

Thanks to the clustering of the project types, the program strategy can be quite detailed and therewith becomes more executable than the overarching innovation strategy. The program strategy specifies new product goals, (for instance percentage of cost saving to be achieved through cost saving projects), arenas of focus (markets, customers, product ranges where the development activities will be focused on), and attack plans. To formulate all this, the total program team should come together, analyse the current state of the category, company A’s current position, the category growth expectations, etc., and come to a plan on how company A will expand the category size, in cooperation with its retailers (appendix I).

The fact that the category teams have the freedom to determine their own strategy, while receiving clear guidelines, will help them feel more involved in the realization of the innovation strategy (Kester, Griffin, Hultink, & Lauche, 2011). Additionally, the company will benefit from letting them use their experience and expertise for determining a good program strategy. The guidelines set by management will help the category to make unambiguous plans and cooperate with a collective ambition.

6.1.5 Collectively create a scoring model

A few years back, company A has formalized its product development process by introducing the stage gate structure. The criteria for a project to pass the gate are however not clear, which makes it hard to deliver the right project information in the gate documents. This indistinct project selection process creates quite some inefficiencies since the project teams do not know what input they should supply to the gate committee. The gate committee is overwhelmed by superfluous input and therefore makes decisions based on quantitative aspects and ‘a feeling’. This results in a decision making process which lacks focus, mainly selecting incremental, short-term and low-risk projects.

In order to help the development employees to understand what input they have to provide so that management can make well-informed decisions, a project scoring model should be created. The scoring model contains clear criteria that a project should meet in order to enter the next stage of development. A hurdle value for each of the criteria helps to filter out the weak projects, and the project score enables project ranking from high to lower potential (Cooper & Edgett, 2001). This ranking can be used for project prioritization.

To realize a maximum positive effect, company A is recommended to let the scoring model be created by (a delegation of) the development departments. By letting R&D, marketing and sales share their points of view on what makes a project promising, increased acceptance and appreciation of their colleagues’ input can be achieved. Additionally, thanks to the combined experience and expertise of these employees, the discussion is very likely to result into a model that considers all important project features. This method also maximizes decision making transparency, which allows the employees to provide the required input and approach this input critically, which will benefit decision making effectiveness.

Company A can create its own project scoring model by arranging several meetings with a delegation of the R&D, marketing and sales department who will represent the opinion of the full departments (see appendix I for a meeting guide). A head start has been made in the first cross-functional session, where the different departments openly shared their insights and showed that their shared knowledge could
lead to a comprehensive model. It is therefore recommended for company A to further develop the scoring model. This should be done by determining whether differences have to be made between the scoring of project types or even project stages. With the clustering of project types within one development budget it is no longer necessary to compare apples to oranges. Rather, the project criteria can be adjusted to the project type - the criteria in a scoring model for a cost savings project could be different from that of an innovation project. Additionally, the hurdle factors and weights of the different project criteria should be determined, and the design team should agree on who will deliver the input for what factor. When the scoring model is finished and has received management approval, it can be put into practice for project selection and prioritization.

6.1.6 Select and prioritize projects
The frequently scheduled go/kill moments at the gates allow for a continuous revision of the current portfolio, ensuring that resources are only allocated to the truly deserving projects. At these frequently scheduled Go/Kill moments, the scoring model can be used to assess the projects’ potential. The score on all main criteria should be added up to a total project attractiveness score. Projects with the highest score have most potential to be successful and therefore have priority over projects with a lower score. Projects should be rank ordered and compared to the budget size. The projects that lie within the budget are then submitted for approval of the MT/CT (Figure 19).

The gate committee (MT/CT) should check the scores of the project in the scoring model and analyse whether the scores are sufficiently supported by information. The gate committee could ask for additional input if the scores don’t seem sufficiently supported. Otherwise, the committee can make decisions based on the project scores. It is important that the gate committee has an overview of all project requests and category plans when it makes these decisions, to make sure that the plans of the different categories do not interfere.

<table>
<thead>
<tr>
<th>Cost saving</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Project 1</td>
<td>16 Project 1</td>
</tr>
<tr>
<td>13 Project 2</td>
<td>16 Project 2</td>
</tr>
<tr>
<td>11 Project 3</td>
<td>14 Project 3</td>
</tr>
<tr>
<td>10 Project 4</td>
<td>12 Project 4</td>
</tr>
<tr>
<td>8 Project 5</td>
<td>12 Project 5</td>
</tr>
<tr>
<td></td>
<td>9 Project 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line extensions</th>
<th>Maintenance &amp; Improvement</th>
</tr>
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<tbody>
<tr>
<td>17 Project 1</td>
<td>16 Project 1</td>
</tr>
<tr>
<td>14 Project 2</td>
<td>15 Project 2</td>
</tr>
<tr>
<td>13 Project 3</td>
<td>12 Project 3</td>
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<tr>
<td>13 Project 4</td>
<td>11 Project 4</td>
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<tr>
<td>10 Project 5</td>
<td></td>
</tr>
<tr>
<td>8 Project 6</td>
<td></td>
</tr>
</tbody>
</table>

= Size of the budget that is earmarked for the specific project type

Figure 19; Projects rank ordered according to project attractiveness score

Once the list of projects that are selected for development is complete, resources should be allocated to the projects. The program team should however determine when a project should be started and when it should be finished. The program team therefore creates a roadmap which specifies when they expect to need development resources, and how many.
At each gate moment, the project scores could have changed (as market developments, development bottlenecks, competitor reactions, etc. could influence the potential of a project). Therefore, the list of active projects should be revised frequently to make sure that at all times, only valuable projects are under development.

**Insight 10; How can company A implement a more proficient portfolio management process?**

In order for *company A* to improve its current performance and efficiently react on environmental turbulence, it should implement portfolio management. This chapter provides a step-by-step guide on how this portfolio management process could be arranged, and shows that the following steps have to be taken:

- *Company A* should formulate a clear innovation strategy.
- The innovation strategy should be reflected in the resource expenditures by means of predestined budgets.
- The budgets should be earmarked to different project types to ensure that both long- and short-term projects receive attention.
- In addition to its current marketing budgets, *company A* should introduce development budgets to create awareness of costs related to development effort.
- Based on the earmarked program budgets, the category teams can formulate an executable program strategy.
- *Company A* needs to formulate clear project selection criteria to allow for focused and profitable new product development.
- Thanks to their expertise and experience, the members of the development departments are most likely to formulate effective selection criteria.
- The scoring model should be used to rank order projects within the earmarked budgets, and to select the high-potential projects that lie within the budget.

### 6.2 Conclusion

The step-by-step guide consists of two interconnected parts; a guide for implementation of the strategic bucket tool, and a guide for proficient project selection by means of the collectively created scoring model. This guide presents steps that need to be taken to improve the current practices, along with evident examples, and meeting guides. This offers practical support for making the necessary decisions and implementing the advised processes proficiently. With the step-by-step guide, the second goal of this research is achieved: ‘Create a step-by-step guide for *company A* that enables proficient implementation of the framework’s design propositions’. There are however some things that *company A* can do to increase the chance of successful implementation of the guide. What they are recommended to do will be discussed in chapter 7.
7 Recommendations

The steps to be taken in order to improve portfolio management success, described in chapter 6, formulate the advised portfolio management structure for company A. This advice is based on extensive theoretical research, and tailored to the organization, its current processes, needs and preferences. Therefore, this advice is not likely to bring along major issues for implementation. There are however some action points and potential bottlenecks that company A should pay close attention to, to increase the chances of successful implementation.

7.1 Determine level of support

The step-by-step guide will only generate positive results when higher management fully supports its implementation. This means that higher management should be willing to change current practices, make required resources available for implementation of the advised portfolio management system and defend the method when challenged. It is therefore recommended to organise an MT meeting with the aim to find consensus on the execution of the step-by-step guide. When full support can be given by higher management, the implementation process can begin.

7.2 Hold someone responsible for implementation

To start with, company A should designate a person who is responsible for the implementation of the step-by-step guide (this could also be a group of people). He should make a planning, ensure that the required meetings are planned, and that they result in the desired meeting outcomes. He should select and invite meeting attendants. Additionally, he should communicate the planning and progress to the management team, and the other layers of the organisation. Ideally, this person is someone that strongly supports the implementation of the portfolio management plan, and has close ties with higher management (without support from higher management, the plan will not succeed!).

In the regularly scheduled MT meetings, higher management of company A should therefore discuss who could take this responsibility and would be willing to do so. The full MT should agree on the person(s) that will take charge, and they should support his actions and communication in relation to the implementation of portfolio management.

7.3 Clear, unambiguous communication

Confusion or blurred information is one of the major enemies of portfolio management success. When choices, responsibilities or processes are not clearly communicated it can bring along several deficiencies. First of all, processes that leave too much room for interpretation will be subject to political influences; people will interpret the rules in such a way that it benefits their own interests. Second of all, it impedes efficient cooperation as the collective goal can differ in the mind of the different team members (Kester, Griffin, Hultink, & Lauche, 2011).

Therefore, company A should clearly communicate the plans they have for implementing the portfolio management system (what is its use, what should be decided, who will cooperate, etc.). And when decisions are made, these decisions should be explained to increase acceptance, it should be communicated to all departments who will have which responsibilities and what is expected from everyone.
7.4 Management should take control
In order to ensure clear communication, management should control the strategic decisions and have an overview of the collective effects generated by product development. Management should aim for consensus on every decision they take to ensure full support and clear communication to lower levels of the organization.

Although management takes major strategic decisions, the departments should feel involved in the realization of this strategy. Therefore, departments should have responsibility over the translation of the strategy into actions.

7.5 Set a course and follow it
Although company A operates in a turbulent industry and clearly has some short-term obligations to meet, it should also set a course to follow for the long-term. The long term plans require time to pay off, and they will only pay-off when that time is given. Company A should therefore make strategic plans, and stick to them. On the long-term, this will create a stronger competitive position and a higher value portfolio.

7.6 Align all management levels
Decisions made on portfolio level should be reflected in the way that programs and projects are managed. Therefore, when company A chooses to formulate a category-based innovation strategy, category programs should be formulated that receive category budgets. Only when these decisions and processes are aligned, the optimal result can be achieved.
8 Conclusion

This chapter presents the conclusions of this case-study research project. Firstly, the research question and its sub-questions will be answered. Secondly, theoretical implication of the research results will be discussed. Thirdly, empirical implications will be outlined. And finally, limitations of this research will be presented in combination with suggestions for future research.

8.1 Research question

The objective of this master thesis was twofold: 1) Develop a conceptual framework that aligns practical portfolio management tools to the interdependent portfolio decision making processes, and 2) Create a step-by-step guide for company A that enables proficient implementation of the framework’s design propositions. The current compartmentalized presentation of portfolio decision making tools appears unjustified since recent literature indicated interdependency of different portfolio decision making processes. The aim of this research project was therefore to find how the practical portfolio management tools can be used in this interdependent process. This led to the following research question: How can practical portfolio management tools be tailored to the interdependent decision making processes to increase success of the new product portfolio at company A?

Portfolio management is defined as “the set of activities that allows a firm to select, develop and commercialize a range of new products that will enable the firm to grow profitably over the long term” (Kester, Griffin, Hultink, & Lauche, 2011, p. 641). It can be considered successful when it enables harmonious achievement of the four main portfolio goals; a high value portfolio, portfolio balance, strategic alignment and resource efficiency. Achievement of these four goals asks for the issues relevant for portfolio management to be built into the way projects and programs are managed. Project management is therefore advised to be formalized and programs should be managed with shared resources at their disposal.

For the achievement of the four portfolio objectives, a variety of tools have been described in literature. Since individual tools do not generate optimal results, the top performing business use multiple portfolio management tools (Cooper, Edgett, & Kleinschmidt, 1998). What combination of tools should be used to generate the optimal result is however unclear. In order to understand when portfolio management tools are sufficiently aligned to harmoniously achieve the four portfolio objectives, literature was used to look into the decision making processes that are needed for successful portfolio management.

From this, it became apparent that effective portfolio decision making can be achieved by the combined use of evidence- and opinion-based decision making processes. By means of three cultural factors that influence both the quality of evidence-and opinion-based decision making processes (trust, collective ambition and transformational leadership), the portfolio decision making effectiveness is shown to result from an interdependent process (Figure 9).

The framework developed in this research shows that practical decision making tools can be tailored to the interdependent portfolio management processes by selecting a set of tools that positively influence the cultural factors and input generating processes that result in decision making success. Because of their positive effect on both the cultural factors and the decision making input, a bottom-up collectively created scoring model in combination with the top-down strategic bucket tool are selected to realise the optimal portfolio decision making, and therewith achieve a successful portfolio. The conceptual framework shows how these two tools can realise portfolio success, and through what mechanisms.
Both qualitative and quantitative analysis showed that Company A has a formalized project management process with regular decision making moments at the gates. Additionally, Company A works with both brand- and category programs. However, there were no established portfolio management procedures. From the analysis it can be concluded that with the decision making processes that are currently in place, Company A experiences multiple problems that impede it from achieving its portfolio management objectives. Firstly, the decision making process of Company A is very quantitative and output-driven, and decisions are made with a short-term reasoning. This creates a portfolio that is overfull of incremental development projects and that lacks highly innovative opportunities. Secondly, Company A does not have a clearly formulated innovation strategy that guides project selection. The lack of project filtering and prioritization that results from this puts high work pressure on the human resources. Thirdly, Company A has a complex organizational structure with many different contact points, decision making parties, and collaborations. The development departments have therefore developed different disciplinary subcultures. In combination with the lack of an overarching strategy, this makes that the departments pursue divergent goals and values. The lack of a collective ambition harms knowledge sharing and fosters an over-the-fence attitude. The result from this is that the development departments fail to collaborate effectively, which leads to rework in later stages of development, and can cause resources to go into firefighting mode. Last but not least, the ambiguous communication and support from management is a bottleneck. Since management doesn’t seem to agree on important decisions, the employees do not receive clear guidelines that help them coordinate and focus their activities. An example is the category teams; the teams have been introduced, but category management has never been fully implemented in the organization since management couldn’t agree whether this was desirable. Company A therefore hangs in between brand and category management and employees are confused; should we pursue an objective and optimal category plan, or should we focus on building strong brands. This phenomenon either leads to subjective category plans, or wounded brand plans, and will not help optimal performance the of brand nor the category.

Insights from a cross-functional survey indicate that these problems are caused by ineffective decision making; portfolio decisions are not made with a clear focus, nor with a portfolio mind set and with a lack of decision making agility. Additionally, the inability to make effective decisions could be influenced by insufficient collaboration, lack of transparencies in the decision making process (no transformational leadership), and the lack of a clear common objective.

When comparing the current processes of Company A to the propositions of the conceptual framework, both strengths and weaknesses can be identified. One of the strengths is that Company A’s formalized project management process allows for frequent and consistent revision of the portfolio composition. However, the decision process at the gates is too much reliant on evidence-based input and creates confusion due to its lack of transparency. The existence of Company A’s category programs shows potential for cross-functional collaboration and strategic alignment, but fails to realize this potential because of its inconsistent implementation and questionable management support.

Input sessions at Company A showed that higher management agreed on the urge to implement the suggested tools; the strategic buckets and the scoring model. In terms of programs, they decided that they prefer to build further on the category organization, but take the brands into account at the same time. They unanimously agreed that the buckets should be assigned to project types, mainly to safeguard innovation efforts.

A scoring model created by the cross-functional team shows that the departments would like the model to include both opinion- and evidence-based decision criteria. Additionally, both internal value
and external value creation should influence the decision. They did indicate that the appropriate scoring model might change per project stage and project type, so further development of the model is required. In order for company A to improve its current performance and efficiently react on environmental turbulence, it should implement portfolio management. By taking the theoretical- and empirical analysis into account, in addition to the highly valued company preferences and insights, the step-by-step guide shows that the portfolio management process can be implemented by means of the following steps:

- **Company A should formulate a clear (category-based) innovation strategy.**
- The innovation strategy should be reflected in the resource expenditures by means of predestined budgets for the different categories.
- The category budgets should be earmarked to different project types to ensure that both long- and short-term projects receive attention.
- In addition to its current marketing budgets, company A should introduce development budgets to create awareness of costs related to development effort.
- Based on the earmarked program budgets, the category teams can formulate an executable program strategy.
- **Company A needs to formulate clear project selection criteria to allow for focused and profitable new product development.**
- Thanks to their expertise and experience, the members of the development departments are most likely to formulate effective selection criteria.
- The scoring model should be used to rank order projects within the earmarked budgets, and to select the high-potential projects that lie within the budget.

### 8.2 Theoretical implications

The contribution that this research offers to the existing theory is that it provides insight into the reason why existing portfolio management tools have so far generated little success in practice. By considering the interdependent decision making processes that forego the creation of a successful portfolio, it becomes apparent that the compartmentalized use and presentation of the portfolio management tools could be considered unjustified. The conceptual framework created in this research therefore combines the abstract model of decision making and the practical decision making tools to describe through what mechanisms the decision making effectiveness can be approved to achieve portfolio success.

Developing theoretical insight on this topic is valuable since insights that prevent or resolve the challenges of practicing portfolio management are scarce, while the urge to effectively and efficiently assign the scarce organizational resources is big.

Furthermore, this research implements a well-known and respected theory from the human performance management field (Performance Management and Enhancement (ProMES) by Pritchard et al., 2002) in the portfolio management field. Based on the principles of the ProMES theory, the often-used scoring model tool is enriched by letting cross-functional departments determine its content. An initial test showed positive results; it resulted in a collaboratively created scoring model that was comprehensive as it included insights from different expertises, and the design team reacted positively on the initiative to let them determine the model’s content. This new approach to an existing portfolio management tools could serve as a starting point for further exploration of the added value of inclusion of the ProMES theory.

### 8.3 Empirical implications

Portfolio management is challenging as it requires individual decisions to be made quickly while maintaining an overview over their collective effect so that the efforts can be focused to realize (long-
term) objectives. The fact that all of this takes place in a multi-project environment where different projects represent different opportunities adds to the complexity of this decision making process.

The research presented in this report presents a step-by-step guide that describes by means of what tools and trough which mechanisms the decision making effectiveness can be approved to achieve portfolio success. By implementing a collectively created scoring model and a strategic bucket tool, cultural factors and input generating processes that influence decision making effectiveness can be positively affected so that a successful portfolio can be achieved. The scoring model helps to implement both evidence- and opinion-based decision making processes, which fosters the portfolio balance in terms of radical- and incremental innovations. By trusting the creation of this model to the development departments, higher management can ensure cross-functional collaboration and increased input quality. By assigning proportional budgets to the strategic programs, the programs can formulate an executable program strategy. Additionally, by earmarking the program budgets, management will ensure that resource expenditures are aligned with the innovation strategy.

It is the role of higher management to determine which strategic programs and earmarked budgets are appropriate for practicing the innovation strategy, and what division of the budgets is desirable. Additionally, management should leave the creation of the scoring model up to the development-related departments, and it should make transparent use of this model after its approval.

With the step-by-step guide presented in chapter 6, the second research goal is accomplished: ‘Create a step-by-step guide for company A that enables proficient implementation of the framework’s design propositions’.

8.4 Limitations and future research
The current research effort should be interpreted with some limitations in mind. These limitations result in suggestions for future research. First, the conceptual framework is developed by means of thorough theoretical support, but is not tested empirically. In order to establish the functioning of the framework, the suggested portfolio management tools should be implemented, and portfolio performance should be monitored. Since this monitoring should be done over the longer-term to measure its long-term effect on portfolio success, the validation of the framework could not be performed within the course of this research. The predicted relation between decision making effectiveness and portfolio performance has been validated by Kester et al. (Forthcoming). Future research could be directed at examination of the other relationships described by the framework by means of long-term performance tracking. Second, the research is only aimed at the new product development portfolio. However, organizations are often concerned with projects other than product development that require time and money; product distribution (which requires specification check and marketing efforts), products for international markets, and technological investments for production. It would be interesting to determine how organizations can align these activities with the product development portfolio to realise efficiency gains; investment decisions in production are ideally made before the product development plans are in need of that specific new machine. Third, a practical limitation in the execution of this research was that the management session was organized before the organization had formulated a clear strategy. The lack of strategy complicated the discussion about possible solution scenarios, as the selected solutions were dependent on the innovation strategy. When this specific research would be replicated, it is advised to let the organisation formulate an innovation strategy before discussing the possibilities of the bucket tool.
References


Kester, L., Hultink, E. J., & Griffin, A. (Forthcoming). An empirical investigation of the entecedents and outcomes of NPD portfolio success. *Accepted for publication in the journal of product innovation management*.


Appendices

Appendix A: Problem stream analysis

Problem stream (Porras, 1987)

Conceptualization

Formalist reactive firm. Company A prefers quantitative decision making (financial measures are leading). This makes that the short-term incremental projects tend to be selected as these have more accurate predictions and this less risk attached. Because of that, more radical opportunities tend to lose out. Therefore, these kind of firms tend to have imbalance in the portfolio. Kester, Hultink & Lauche (2009) label these firms as formalist-reactive and state that they tend to struggle to align the portfolio to the innovation strategy.

Resource overload leads to inefficiency. The lack of strategy creates an unfocused project selection. Many projects pass the gates, and priorities are not clear. This creates pressure on the R&D resources. - ‘Projects are put on hold. Then we run again, and put on hold again.’ - ‘All projects seem to have priority.’ This resource overload leads to inefficient work and time pressure (Cooper, Edgett, & Kleinschmidt, 1999).

Occupied with urgent problems. The lack of knowledge sharing early on in the project often leads to the identification of problems only late in the NPD cycle. This leads to rework and pressure on the resources as their allocation to fix these problems is unplanned. In literature, the situation in which employees are constantly occupied with urgent problems is referred to as firefighting (Repenning, 2001).

Category management. “The category teams are introduced, but have had limited management support. This made that the required processes are not clear and it is easy to fall back into old patterns: brand-thinking. Moreover, the budgets are assigned to the brand. Therefore, the brand formulated a strategy, and the category is shaped to fit this strategy.” Abovementioned quote illustrates that the category is not the leading platform. Rather, there exists a conflict between brand- and category management. This conflict has a negative effect on the objectivity of the category plan (brand get advantage over category benefit. This might create short-term advantage, but will harm long-term category sales performance and supplier-retailer trust (Gruen & Shah, 2000).
Appendix B: Keywords used for literature research

Initial list of keywords:
- Portfolio management
- R&D portfolio
- New product portfolio
- Resource allocation
- Strategic alignment portfolio
- Portfolio management tools

These six keywords were used as a starting point in the search engine. When a particular keyword resulted in too many articles to screen appropriately, the keyword was specified in more detail or accompanied by another keyword. Also, results of some search strings delivered inspiration for new keywords. The table below shows what search strings were used and how many hits resulted from these searches. The search strings that had a manageable amount of hits were personally analysed on usability.

<table>
<thead>
<tr>
<th>Search string</th>
<th>Total hits</th>
<th>Useful after first glance</th>
<th>Useful after reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB (Portfolio management)</td>
<td>3804</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI (Portfolio management)</td>
<td>553</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB (Project portfolio management)</td>
<td>435</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI (Project portfolio management)</td>
<td>65</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>TI (R&amp;D portfolio)</td>
<td>67</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>AB (New product portfolio)</td>
<td>546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI (New product portfolio)</td>
<td>30</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>TI (Resource allocation)</td>
<td>1243</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB (Portfolio management resource allocation)</td>
<td>52</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>TI (Strategic alignment portfolio)</td>
<td>27</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AB (Portfolio management tools)</td>
<td>357</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI (Portfolio management tools)</td>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AB (Portfolio decision making tools)</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI (Portfolio decision making)</td>
<td>25</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

The 13 articles that proved useful after reading were used as a starting point for the literature review. By means of the snowballing technique, additional articles could be gathered that provided more insight into the subjects of interest.
## Appendix C: Resource quality ranking

<table>
<thead>
<tr>
<th>Article</th>
<th>Author</th>
<th>Journal</th>
<th>Impact factor</th>
<th>ABS Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value creation and category management through retailer-supplier relations</td>
<td>Aastrup, Grant, &amp; Bjerre</td>
<td>International review of retail, distribution and consumer research</td>
<td>/</td>
<td>(1)</td>
</tr>
<tr>
<td>A conceptual framework for ranking R&amp;D projects</td>
<td>Bitman &amp; Sharif</td>
<td>IEEE transactions on engineering management</td>
<td>0.9</td>
<td>(3)</td>
</tr>
<tr>
<td>Program management and the creative art of cooperation: Dealing with potential tensions and synergies between spatial development projects</td>
<td>Buuren, Buijs, &amp; Teisman</td>
<td>International journal of Project Management</td>
<td>1.7</td>
<td>(2)</td>
</tr>
<tr>
<td>A theoretical framework for managing the new product development portfolio: when and how to use strategic buckets</td>
<td>Chao &amp; Kavadias</td>
<td>Management Science</td>
<td>1.9</td>
<td>(4)</td>
</tr>
<tr>
<td>Perspective: The stage gate Idea-to-Launch process - update, what’s new, and NexGen systems</td>
<td>Cooper</td>
<td>Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Overcoming the crunch in resources for new product development: lessons from the leaders II</td>
<td>Cooper &amp; Edgett</td>
<td>Research technology management</td>
<td>0.7</td>
<td>/</td>
</tr>
<tr>
<td>Portfolio management in new product development: Lessons from the leaders II</td>
<td>Cooper, Edgett &amp; Kleinschmidt</td>
<td>Research technology management</td>
<td>0.7</td>
<td>/</td>
</tr>
<tr>
<td>Best practices for managing R&amp;D portfolios</td>
<td>Cooper, Edgett &amp; Kleinschmidt</td>
<td>Research Technology Management</td>
<td>0.7</td>
<td>/</td>
</tr>
<tr>
<td>New product development: practices and performance</td>
<td>Cooper, Edgett &amp; Kleinschmidt</td>
<td>Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Developing design propositions through research synthesis</td>
<td>Denyer, Transfield &amp; Aken</td>
<td>Organization studies</td>
<td>2.2</td>
<td>(4)</td>
</tr>
<tr>
<td>Applying 'Options Thinking' to R&amp;D valuation</td>
<td>Faulkner</td>
<td>Research technology management</td>
<td>0.7</td>
<td>/</td>
</tr>
<tr>
<td>Determinants and outcomes of plan objectivity and implementation in category management relationships</td>
<td>Gruen &amp; Shah</td>
<td>Journal of retailing</td>
<td>1.2</td>
<td>(4)</td>
</tr>
<tr>
<td>Industrial companies’ evaluation criteria in new product development gates</td>
<td>Hart, Hultink, Nikolas &amp; Commandeur</td>
<td>Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Exploring portfolio decision-making processes</td>
<td>Kester, Griffin, Hultink &amp; Lauche</td>
<td>Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>An empirical investigation of the antecedents and outcomes of NPD portfolio success</td>
<td>Kester, Hultink &amp; Griffin</td>
<td>Accepted for publication in the Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Portfolio decision-making genres: a case study</td>
<td>Kester, Hultink &amp; Lauche</td>
<td>Journal of engineering and technology management</td>
<td>1.0</td>
<td>/</td>
</tr>
<tr>
<td>Project portfolio management for product innovation</td>
<td>Killen, Hunt &amp; Kleinschmidt</td>
<td>International journal of quality &amp; reliability management</td>
<td>/</td>
<td>(2)</td>
</tr>
<tr>
<td>Participation in the design of performance management systems: a quasi-experimental field study</td>
<td>Kleingeld, Van Tuijl &amp; Algera</td>
<td>Journal or organizational behavior</td>
<td>3.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Tailoring product development to strategy: case of an European technology manufacturer</td>
<td>Loch</td>
<td>European management journal</td>
<td>0.6</td>
<td>(2)</td>
</tr>
<tr>
<td>Organizational strategy, structure and process</td>
<td>Miles &amp; Snow</td>
<td>Academy of management review</td>
<td>7.9</td>
<td>(4)</td>
</tr>
<tr>
<td>Portfolio management in practice and in context</td>
<td>Martinsuo</td>
<td>International journal of project management</td>
<td>1.7</td>
<td>(2)</td>
</tr>
<tr>
<td>Interpersonal trust between marketing and R&amp;D during new product development projects</td>
<td>Massey &amp; Kyriazis</td>
<td>European journal of marketing</td>
<td>0.8</td>
<td>(3)</td>
</tr>
<tr>
<td>Standardized project management may increase development projects success</td>
<td>Milosevic &amp; Patanakul</td>
<td>International journal of project management</td>
<td>1.7</td>
<td>(2)</td>
</tr>
<tr>
<td>Use of evaluation criteria in innovation performance in the front end of innovation</td>
<td>Martinsuo &amp; Poskela</td>
<td>Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Project management in European Aerospace plc: a case study</td>
<td>Quayle</td>
<td>Industrial management &amp; Data systems</td>
<td>1.7</td>
<td>(1)</td>
</tr>
<tr>
<td>Understanding firefighting in new product development</td>
<td>Repenning</td>
<td>Journal of product innovation management</td>
<td>1.6</td>
<td>(4)</td>
</tr>
<tr>
<td>Technological innovation, product development, and entrepreneurship in management science</td>
<td>Shane &amp; Ulrich</td>
<td>Management science</td>
<td>1.9</td>
<td>(4)</td>
</tr>
</tbody>
</table>
In order to ensure a high-quality literature review, some selection criteria are set for the used resources.

For the selected journals, at least an ISI ranking at web of knowledge or a recognized standard by ABS ranking 2010 was set as a minimum. In order to judge the quality of the reports and books, the writers are analysed on their quality by looking for published articles. If the writer of the book has articles published in high quality journals, the assumption is made that the book is probably of a comparable quality.

<table>
<thead>
<tr>
<th>Book/paper</th>
<th>Author</th>
<th>Also published in</th>
<th>Impact factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio Management for New products: Picking the winners</td>
<td>Cooper &amp; Edgett</td>
<td>Journal of product innovation management (4), Research Technology management</td>
<td>1.6, 0.7</td>
</tr>
<tr>
<td>Winning at new products: accelerating the process from idea to launch</td>
<td>Cooper</td>
<td>Journal of product innovation management (4)</td>
<td>1.6</td>
</tr>
<tr>
<td>Marketing management</td>
<td>Kotler &amp; Keller</td>
<td>Journal of marketing (4), Journal of marketing research (4)</td>
<td>3.4, 2.3</td>
</tr>
<tr>
<td>Program management for improved business results</td>
<td>Milosevic, Martinelli &amp; Wadell</td>
<td>International journal of project management (2)</td>
<td>1.7</td>
</tr>
<tr>
<td>Stream analysis: a powerful way to diagnose and manage organizational change</td>
<td>Porras</td>
<td>Journal of applied behavioural science (1)</td>
<td>1.1</td>
</tr>
<tr>
<td>Improving organizational performance with the productivity measurement and enhancement system: an international collaboration</td>
<td>Pritchard, Holling, Lammers &amp; Clarck</td>
<td>Journal of applied psychology (4), Personnel psychology (4)</td>
<td>4.8, 3.7</td>
</tr>
<tr>
<td>Problem solving in organizations: a methodological handbook for business students</td>
<td>Van Aken, Berends &amp; Van de Bij</td>
<td>Journal of management inquiry (3), Journal of management studies (4)</td>
<td>1.1, 3.8</td>
</tr>
<tr>
<td>Case study research: design and methods</td>
<td>Yin</td>
<td>Health services research, Public administration review (4)</td>
<td>2.3, 0.9</td>
</tr>
</tbody>
</table>
Appendix D: Determination of the unit of analysis

Development activities for:

Initiated by:

- Brand Marketing
- PL Sales
- Saving R&D
- Supply procurement
- Foreign PTD
- Production PTD
- Packaging

Objectives:

- Project overview
- Resource capacity insights
- Right (amount of) projects
- Strategy achievement
- Limit amount of rework
- Clear distribution of responsibilities
- Look further ahead
- Overview costs

Outside the research scope
Within the research scope

Product portfolio
Process portfolio
Appendix E: Guide for semi-structured interviews

Short introduction of myself, the project, the concept of portfolio management. Respondents were informed about the anonymity of the interviews, to ensure that they could speak openly.

Role and responsibilities
- What is your function within company A, and how are you involved in the product development process?

Decision characteristics
- Can you describe how portfolio decision-making processes within company A work?
- Are you involved in any decisions that concern the product development portfolio? Can you describe how these decisions are made?
- How do the brand plans, account needs and category plans influence the decision?
- When you are involved in a portfolio decision what kind of information do you need to make portfolio decisions? Who is in charge of making the final decision?
- How do the portfolio choices influence you daily activities?
- Can you name three strengths and three points for improvement of the current decision making process?

Methods
- Is there a protocol for decision making?
- What kinds of methods are being used within company A for making portfolio decisions?
- How do you use these methods?
- What are in your opinion the pros and cons of these methods?

Individual decision making aspects
- Do you think that the experience of different departments is optimally used in decision making?
- How do you think your experience and expertise helps you in making portfolio decisions?
- What is the most important driver behind choosing one option over another?
### Appendix F: Survey questions & results

#### NPD PORTFOLIO SUCCESS

<table>
<thead>
<tr>
<th>Strategic Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The projects in our NPD portfolio collectively contribute to achieving our strategic goals</td>
</tr>
<tr>
<td>The projects funded for development DO NOT reflect the priorities of our business strategy</td>
</tr>
<tr>
<td>I see how the objectives of the projects are aligned to the business strategy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our NPD portfolio is balanced in terms of incremental (improvements) and radical (really new) projects</td>
</tr>
<tr>
<td>The projects in our NPD portfolio are balanced across the various development stages (idea-launch)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our NPD portfolio has the right number of projects for our available resources</td>
</tr>
<tr>
<td>Our projects are done in a timely and time efficient fashion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximal portfolio value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our NPD portfolio contains several high impact projects in terms of revenues</td>
</tr>
<tr>
<td>I DO NOT believe that the current composition of our NPD portfolio will maximize long term (&gt;2 years) profitability</td>
</tr>
</tbody>
</table>

#### PORTFOLIO DECISION MAKING EFFECTIVENESS

<table>
<thead>
<tr>
<th>Portfolio mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>At all times, I have an overview of all the projects in our NPD portfolio</td>
</tr>
<tr>
<td>I understand how each project relates to other projects in our NPD portfolio</td>
</tr>
<tr>
<td>I can readily anticipate where bottlenecks may occur in our development pipeline</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is NOT clear which projects in our NPD portfolio have priority</td>
</tr>
<tr>
<td>Our resource allocation in the short term reflects our long term NPD portfolio priorities</td>
</tr>
<tr>
<td>At company A, we work in a focused manner and do not easily get distracted from our priorities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our NPD portfolio decision-making processes are speedy enough to assure that we can quickly act upon new opportunities</td>
</tr>
<tr>
<td>We rapidly change our NPD portfolio priorities when we detect a new market opportunity</td>
</tr>
</tbody>
</table>

#### PROJECT SELECTION PROCESS

| Arla’s project selection method has clearly defined rules & procedures | Cooper, Edgett & Kleinschmidt (1999) |
| This method is consistently applied to all appropriate projects | Cooper, Edgett & Kleinschmidt (1999) |
| Our current method is efficient | Cooper, Edgett & Kleinschmidt (1999) |
| Our current method is effective | Cooper, Edgett & Kleinschmidt (1999) |
| All projects are considered together (we compare them against each other) | Cooper, Edgett & Kleinschmidt (1999) |
| I would recommend our project selection method to others | Cooper, Edgett & Kleinschmidt (1999) |
| Arla uses a predefined set of criteria to evaluate and select product concepts | Martinsuo & Poskela (2011) |
If Arla uses a predefined set of criteria, Select the 3 criteria that are most leading in the project evaluation for continue/hold decision making

<table>
<thead>
<tr>
<th>Criteria</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic fit</td>
<td>Cooper, Edgett, Kleinschmidt (1998)</td>
</tr>
<tr>
<td>Long term pay off</td>
<td>Cooper, Edgett, Kleinschmidt (1998)</td>
</tr>
<tr>
<td>Risk &amp; Probability of success</td>
<td>Cooper, Edgett, Kleinschmidt (1998)</td>
</tr>
<tr>
<td>Timing</td>
<td>Cooper, Edgett, Kleinschmidt (1998)</td>
</tr>
<tr>
<td>Technical feasibility</td>
<td>Cooper, Edgett, Kleinschmidt (1998)</td>
</tr>
<tr>
<td>Commercialization capability</td>
<td>Cooper, Edgett, Kleinschmidt (1998)</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
</tbody>
</table>

**CROSS-FUNCTIONAL COOPERATION**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with our working relationship</td>
<td>Based on Massey &amp; Kyriazis (2007)</td>
</tr>
<tr>
<td>The other departments DO NOT fully carry out their responsibilities and commitments</td>
<td></td>
</tr>
<tr>
<td>The other departments respond well to feedback and advice from myself</td>
<td>Based on Kwak (2004)</td>
</tr>
<tr>
<td>I frequently talk to other people in the company besides my own department</td>
<td></td>
</tr>
<tr>
<td>The different departments cooperate efficiently to get the work done</td>
<td>Based on Massey &amp; Kyriazis (2007)</td>
</tr>
<tr>
<td>Overall, our working relationship is successful</td>
<td></td>
</tr>
</tbody>
</table>
Survey results:  

\[ \text{1} \quad \text{2} \quad \text{3} \quad \text{4} \]

A high value portfolio

Our NPD portfolio contains several high impact projects in terms of revenues

\[ \text{2.25} \quad \text{2.88} \]

I believe that the current composition of our NPD portfolio will maximize long term profitability

\[ \text{2} \quad \text{2.84} \]

Strategic alignment

The projects in our NPD portfolio collectively contribute to achieving our strategic goals

\[ \text{3.25} \]

The projects funded for development reflect the priorities of our business strategy

\[ \text{3.08} \quad \text{4} \]

I see how the objectives of the projects are aligned to the business strategy

\[ \text{2.84} \quad \text{3.75} \]
Resource efficiency

Our NPD portfolio has the right number of projects for our available resources.

Our projects are done in a timely and time efficient fashion.

Portfolio balance

Our NPD portfolio is balanced in terms of incremental (improvements) and radical (really new) projects.

The projects in our NPD portfolio are balanced across the various development stages (idea-launch).
### Project selection process

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>St. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arla’s project selection method has clearly defined rules &amp; procedures</td>
<td>2.8</td>
<td>0.7</td>
</tr>
<tr>
<td>This method is consistently applied to all appropriate projects</td>
<td>2.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Our current method is efficient</td>
<td>2.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Our current method is effective</td>
<td>2.6</td>
<td>0.7</td>
</tr>
<tr>
<td>All projects are considered together (we compare them against each other)</td>
<td>2.8</td>
<td>0.8</td>
</tr>
<tr>
<td>I would recommend our project selection method to others</td>
<td>2.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Arla uses a predefined set of criteria to evaluate and select product concepts</td>
<td>17% Yes, 48% No, 35% Don’t know</td>
<td></td>
</tr>
</tbody>
</table>

If Arla uses a predefined set of criteria, Select the 3 criteria that are most leading in the project evaluation for continue/hold decision making

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Nr of ‘votes’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales in units</td>
<td>3</td>
</tr>
<tr>
<td>Product uniqueness</td>
<td>2</td>
</tr>
<tr>
<td>Intuition</td>
<td>1</td>
</tr>
<tr>
<td>Strategic fit</td>
<td>2</td>
</tr>
<tr>
<td>Long term pay off</td>
<td>2</td>
</tr>
<tr>
<td>Break-even time</td>
<td>1</td>
</tr>
<tr>
<td>Risk &amp; Probability of success</td>
<td>1</td>
</tr>
<tr>
<td>Timing</td>
<td>1</td>
</tr>
<tr>
<td>Technical feasibility</td>
<td></td>
</tr>
<tr>
<td>Commercialization capability</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
</tbody>
</table>

### Cross-functional cooperation

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>St. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with our working relationship</td>
<td>3.0</td>
<td>0.9</td>
</tr>
<tr>
<td>The other departments fully carry out their responsibilities and commitments</td>
<td>3.2</td>
<td>0.8</td>
</tr>
<tr>
<td>The other departments respond well to feedback and advice from myself</td>
<td>3.3</td>
<td>0.7</td>
</tr>
<tr>
<td>The different departments cooperate efficiently to get the work done</td>
<td>2.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Overall, our working relationship is successful</td>
<td>3.1</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Appendix G: Interview quotes on process bottlenecks (in Dutch)

1. We ervaren druk vanuit retailers om snelle innovaties te doen
2. Er is geen capaciteitsoverzicht
3. Capaciteiten worden gezocht nadat projecten zijn geaccepteerd
4. Soms worden projecten vooruitschuiven
5. Projecten worden vrijwel altijd gestart
6. We hebben geen plan; we leven op de grillen van de dag
7. We doen wel erg veel kleine projecten
8. Er wordt te hard vastgehouden aan timing
9. Er is een late link naar sales
10. Marketing visie wordt niet door iedereen gedeeld
11. Verschil in meningen binnen het MT; MT is niet echt een team
12. Categorie teams worden niet op elkaar afgestemd
13. Besluiten worden genomen gebaseerd op financiële voorspellingen
14. Er is geen hoofd strategie
15. De focus verplaatst constant
16. Korte termijn projecten krijgen vaak voorrang
17. Verschil in persoonlijkheden van MT leden; structuur vs. Actie
18. Er is hoge druk op de R&D resources (vele afdelingen vissen uit dezelfde poel)
19. Spanningsveld merken/PL onderling
20. Geen formele kennisdeling Marketing, PPD, Sales
21. Er is een grote variëteit aan receptuur, en dat is niet efficiënt
22. Kwaliteit/concreetheid van business cases niet goed genoeg voor Capex
23. Niet duidelijk wat de verschillende teams doen/ wat de verantwoordelijkheden zijn
24. Marketing lijkt soms ‘bang’ om plannen te presenteren
25. Rolverdeling in product development is erg lastig: matrix structuur
26. Brand managers (project leiders) hebben niet altijd management capaciteiten
27. We hebben een complexe bedrijfsstructuur – verschillende rapporteer punten
28. De strategie wordt bottom-up bepaald door merken (daarna door categorie)
29. Ideeën worden last-minute gegenereerd
30. We hebben veel pressure projecten
31. Project selectie is gebaseerd op sales contributie, volume & winstbijdrage
32. Er is geen samenwerking in vroeg stadium
33. Categorie team is niet het hoofd orgaan; er zijn veel losse structuren
34. Budgetten worden per merk verdeeld
35. Budgetten worden per kalenderjaar afgegeven
36. Er is veel rework
37. Plannen worden opgezet maar niet doorgevoerd/ondersteund
38. Intern & extern niet duidelijk waar de merken voor staan
39. Niet duidelijk wat de huidige situatie is (wat hebben we?)
40. Er worden geen guidelines gegeven voor veranderingen
41. MT levert geen eenduidige ondersteuning
42. Het is niet duidelijk hoe de budget verdeling de strategie representeert
43. Er is geen algemene visie; waar gaan we naartoe?
44. Geen guideline op wat de wél en niét moeten doen
45. Er worden geen knopen doorgehakt door het MT
46. Er is niemand die inziet dat niet alles kan
47. We zijn vooral druk met brandjes blussen ipv. vooruitkijken (firefighting)
48. Er wordt niet van te voren ingeschat hoe hoog de werkdruk is voor een project
49. Alles moet het liefst morgen nog resultaat opleveren
50. De plannen worden vaak halverwege aangepast
51. Sales wordt pas laat betrokken
52. We leveren wel resultaat, maar dit wordt inefficiënt behaald
53. De marketing strategie is niet overal bekend
54. Er is geen duidelijke toedeling van verantwoordelijkheid.
55. Omdat de gewenste processen van de categorie teams niet duidelijk zijn, is het makkelijk om terug te vallen in oude patronen; het merk-denken.
56. Projecten worden on hold gezet, dan rennen we, en worden ze ineens weer on hold gezet.
57. Projecten worden soms overgedragen aan collega’s als ik te veel werkdruk heb.
58. Projecten die echt potentie hebben zouden meer prioriteit moeten krijgen
59. Korte termijn profijt staat centraal.
60. Het lijkt alsof we niet helemaal weten wat we nou willen.
61. Veel efficiëntie kan behaald worden door de samenwerking tussen marketing, R&D en sales te verbeteren.
62. We hebben het zo druk met brandjes blussen, dat we geen tijd hebben voor niet-urgente belangrijke dingen.
63. De activiteiten van vandaag geven het liefst morgen al resultaat.
Appendix H: Initial list of criteria for the scoring model

Sales contribution over multiple years
Business case
Contributes to strategy
Builds on core competencies
Ease of implementation
Expected short- and long-term profit
Category growth
Environmental influence
Customer need
Trend
Innovation
Long term right to exist
(Technical) feasibility
Cannibalisation of own portfolio
Contribution to product concept
Commercial risk
Production risk
Production issues
Growth expectations
Alignment with production strategy
Solution for consumer/added value
Retail alignment
Required resources
Point on the horizon
Time vs quality
Meeting guide: formulate the innovation strategy

**Brand driven innovation**
> Brand building drives product development. How company A reacts on other innovation opportunities (technological evolution, category opportunities, trends, etc.) depends on the brand.

> Given the different circumstances and opportunities, how can we best build our brand?

> Main objective is to build brand equity in the mind of the consumer.

> Company A confronts with main competitor to create high brand equity.

> Marketing becomes key activity to build brand image.

> Main reason for retailer to stock company A’s products is to satisfy its shopper.

**Category driven innovation**
> Growing the category drives product development. How company A reacts on other innovation opportunities (technological evolution, brand building, trends, etc.) depends on the category mix.

> Given the different circumstances and opportunities, how can we create the best category mix?

> Main objective is to cooperate with the retailer to grow category sales and therewith increase the sales of the brands that are offered through that category.

> Sales becomes key activity to build retailer relationship.

> Marketing guards the brand vision, so that the brand represents a strong option to react on category opportunities.

> Company A can become preferred supplier and therewith grow its share in the categories.

**Meeting goal:**
Decide what is company A’s main objective and what will be their strategy in achieving this objective.

**Suggested attendants:**
The innovation strategy can best be formulated and agreed upon by the full management team.

**Requirements:**
The innovation strategy should present a long term road that company A can follow to achieve its objective.

**Meeting outcome:**
The meeting concludes with an innovation objective and -strategy on which the total MT has reached consensus.

**Follow-up:**
The innovation objective and -strategy should be clearly communicated through all levels of the organization so that they can form a basis for collective effort in the product development activities.

**Meeting frequency:**
The innovation strategy should be a stable guideline and should therefore not be subject to frequent changes. It is suggested to revisit the innovation strategy once a year. Having a strategic meeting on a yearly basis will ensure that the strategy is a stable guideline, while it remains aligned with changes in the market.
Meeting guide: Create strategic programs

Recap:
> Programs allow for a more detailed and executable program strategy.
> Budgets assigned to the programs enable distinction in strategic importance, execution of long-term plans, and awareness of project costs.
> Programs should incorporate private label product development strategy (either through a PL strategy, or through incorporation of PL in the category plans).
> Category programs enable tailored cooperation of the different development departments.
> Category programs ask for a multi-layered strategy where the creation of the optimal category mix is key, but the brand message is safeguarded simultaneously.
> The multi-layered character of category programs can be supported by clear descriptive visualizations.

Questions to answer in case of a category (brand) driven innovation strategy:
> What category (brand) programs can be distinguished?
> How important are the respective categories (brands) to achieve the innovation strategy?
> What development- and marketing budget will be available for each program to realize its strategy?
> Who will be the program managers?
> In case of a category driven innovation strategy: Who will be the brand supervisors?
> Who will join the category (brand) team?

Meeting goal:
Create a program structure and determine the development budgets that should be assigned to the respective programs.

Suggested attendees:
As the relative importance of the different programs is a strategic choice that influences the total organization, it is advisable to involve the complete MT in this meeting.

Requirements:
The program structure and budget distribution should be aligned to the innovation strategy. The budgets assigned to the programs should be overall development budgets, rather than solely marketing budgets.

Meeting outcome:
The meeting concludes with strategic programs which all have their own development budget. The development budget is specified in terms of marketing budget and development hours.

Follow-up:
The program structure and their relative budgets should be clearly communicated and supported.

Meeting frequency:
Just like the innovation strategy, the program structure should be a stable guideline for development activities. On contrary, the budgets assigned to the programs should not always be too rigid, company A can make minor changes in case big opportunities arise. Budgets can therefore be discussed bi-monthly. Nevertheless, changes should remain small, as the program budgets should still provide a secure basis to plan program activities.
Meeting guide; Earmark the program budgets

Necesity:
> Due to the high pressure to generate positive returns, company A has developed a short-term focus where longer-term projects are postponed to realize the short-term possibilities.
> Pre-defining budget allocation to different project types will help to define the amount of attention these projects require, and will safeguard these aspirations. Defined budgets will decrease competition amongst plans and therewith ensure that long-term plans do not go at the expense of the short-term.
> The misbalance in the portfolio of company A (as a result of short-term focus) impedes company A to realize long-term value creation and strategic alignment. The pressure that resources experience as a result of the high amount of short-term pressure-projects, and the rework that results from that hinders organizational efficiency.
> The budget distribution will help program managers to formulate more detailed action plans.

Questions to answer:
> What project types can be distinguished?
> How important are the respective project types within each program?
> What proportion of the program budget should be available for each project type? How important is radical innovation in this category? How much attention do we spend at cost savings, etc.

Meeting goal:
Specify how the program budget should be divided over different project types to assure realization of long- and short-term strategic aspirations.

Suggested attendants:
Given the strategic impact of the earmarked budgets and the need to align aspirations of the different programs, this decision should be made by higher management. It is required for management of the development related departments (R&D, Marketing, Sales & Operations) to agree on budget distribution, it is optional to involve the other MT members.

Requirements:
In which category do we want to expand the available product ranges by means of radical innovation? In what category is focus more on keeping the current offering up-to-date by means of incremental product development? These are questions that should influence the budget ratio across the project types. Management should take into consideration the internal needs (cost saving, research, maintenance, etc.) as well as external circumstances (market growth, innovation opportunities) when allocating the budgets to the programs.

Meeting outcome:
The meeting concludes with predefined expenditures of the program budgets, which represent the strategic aspirations.

Follow-up:
The budget distribution should be communicated to the program teams so that they can formulate action plans. Higher management should clarify the reasoning behind the budget distribution to increase acceptance. To remain focused and achieve the long-term innovation objectives, it is crucial for management to support and defend the budget distributions when they are challenged.

Meeting frequency:
The predefined budget allocation can be discussed bi-monthly together with the program budgets.
Meeting guide; formulate the program strategy

The need for a program strategy
- By earmarking the program budgets, higher management maintains the overview over the total portfolio and how the resource allocation will create the right focus to achieve the organizational objectives.
- Letting the program teams formulate their own program strategy based on these budgets will make them more involved and committed to the realization of the innovation strategy.
- The innovation strategy and the budget distribution communicate the organizational aspirations, but do not give a clear notion of what to do. The program strategy is therefore needed to translate aspirations into actions.
- More than higher management, the development departments have practical knowledge and experience that is quite valuable for the creation of realistic action plans.

Rules for a good program strategy
- The program strategy should be aligned with the innovation strategy; if the program strategy is achieved, we are one step closer to achieving the innovation objectives.
- The new product goals should be realistic within the budget that is earmarked for the project types.
- The new product goals should not be in conflict with the creation of an optimal category plan.
- The program strategy should be a clear guideline for idea generation and project selection.

Meeting goal:
Develop a program strategy and decide on key goals to be achieved with this year’s program budget.

Suggested attendants:
The complete program team (including members from R&D, Marketing and Sales) should think along on how the program strategy should be formulated.

Requirements:
All members of the team should share relevant insights and use their expertise so that a well-founded and realistic action plan can be created. The program strategy should adhere to the rules of a good program strategy.

Meeting outcome:
The program team should conclude the meeting with a clear program strategy and a roadmap which indicates the focus points and plan of attack.

Follow-up:
The program strategies and roadmaps should be revised by MT/CT. It could be that the roadmaps of the different programs happen to have the center of gravity on the same moment in time which would result in resource scarcity. Management can then ask the program teams to align their plans. In case this is impossible (given the major importance of the projects and their specific planning), management could consider to make more R&D resources available for this specific period.

Meeting frequency:
The program strategy should give a clear guideline for decision making and idea generation. Therefore it should remain quite stable over time. It can however be that changed circumstances ask for slight adjustments. It is therefore suggested that the program team discusses the program strategy bi-monthly; if changes are required, these should be extensively supported by argumentation, and revised by the MT/CT.
Meeting guide: Creating main criteria & scoring factors

Meeting requirements

> Face-to-face discussion is one of the key features that will enhance the success of the scoring model. Different views broaden the perspective of the team members and makes for a better system.

> Every aspect that is of importance should be included in the model, what you measure is what you get.

> The model normally would contain around 3-6 main criteria. And each criteria should be scored by 1-5 factors.

> Everyone should agree on the final model!

Steps to take

> Determine the composition of the design team

> Have open discussion about what main criteria should be used, until consensus can be achieved

> Determine scoring factors that can indicate the extent to which the main criteria are achieved

> Ask for management approval

Composition of the design team

The first decision is the structure and function of the design team. The role of the design team is to be responsible for designing and implementing the scoring model. The team is composed of two types of people: facilitators and members from the R&D, marketing and sales departments.

- The facilitator is important to the success of the effort. He/she will be responsible for:
  - Making sure the development process proceeds correctly and in timely manner.
  - Serving as moderator & discussion leader in meetings.
  - Ensuring that all essential people are included in the process.
  - Ensuring that design personnel receives the info they need.
  - And offer guidance to the team so that they do not overlook important issues or policies.

- Incumbents (typically 3 to 6).
  - The best choice is for the facilitators to select key opinion leaders or individuals in key jobs in the departments.
  - Preferably, the R&D, marketing and sales departments are evenly represented in the team.
  - There are two possibilities, or they stay the whole project, or incumbents rotate to different jobs. Rotating is not preferable.

Identify main criteria

The main criteria should be a list of things that indicates a project’s potential; if the project would meet all these criteria, it is likely to become a success.

It could be that this list differs per project gate; in the idea-feasibility stage, different criteria might be used than in the development-launch stage. Company A could for instance consider an additive list where the amount of criteria that have to be scored increases.

Company A should also discuss whether different project types require different criteria, does a cost-saving project need to be reviewed on different aspects than a line extension?

The team continues until they are satisfied that the list of criteria is complete and accurate (typically 3-6 products). Because only 3-6 products should result, the phrasing of the products should be fairly general such as "Maintaining high quality". Be careful that measures of a criterion (scoring factors) do not get confused with the main criteria. Since what is not measured might be neglected, the set of products should be complete. No meaningful project properties should be omitted. To ensure completeness, discussion is needed until group is satisfied that it is complete.
Determine scoring factors
Once the main project criteria have been agreed upon, scoring factors should be designed. A scoring factor is a concrete measure of how well the project is meeting the criterion.
Ask the following question: How would you measure how well the project performs on each of the criteria? What would you point to for showing the MT/CT that the project is meeting the required criteria?
Again, the group will keep working on the list of scoring factors until they are satisfied that it is complete and accurate. When completed, the number of scoring factors will typically range from 5-15 (best between 8-10). Each criterion will have at least one factor and may have as many as 5-6. The number of scoring factors should be kept to a measurable number, to prevent the system from becoming too complex.

The list of scoring factors should meet the following requirements:
First, the factors as a set must cover all the criteria, and cover each criterion completely.
Second, the factors must be valid, meaning that what is measured is an accurate index of criterion accomplishment.
To test validity, ask:
1. If the project was very high on the measure, would this be good for the organization?
2. What are the long-term implications when projects are selected that make the index look good?
Finally, indicators must be understandable and meaningful to the personnel.

Ask for management approval
When the design team has come to consensus on both the list of main criteria and the scoring factors, the proposed model is presented to higher management. Management has the opportunity to suggest revisions, which is not only important for acceptance, but also so that all agree that the system represents the organizational aspirations. Occurrence of this step should be clear to participants from start.
It is important that the incumbents in the unit present the system as theirs, and defend the choices that they made.
The goal of the approval meeting should be one of mutual problem solving, not a negotiating session. The facilitators should keep the discussion on a constructive level, suggest compromise positions and keep the meeting on track.

Meeting frequency
In order to design a comprehensive list of criteria and scoring factors, potentially adjusted to different gates or project types, it is likely that several meetings are required. The time between different meetings is important (normally two weeks). Simply letting time pass in-between meetings is an excellent tool for dealing with disagreements.