



**UNIVERSITY OF GOTHENBURG**  
**SCHOOL OF BUSINESS, ECONOMICS AND LAW**

Master Degree Project in Innovation and Industrial Management

## **Decision-Making in Portfolio Management**

A qualitative case study on how Polarbröd can utilize their product portfolio and improve prioritization between projects with regard to risk and value

Lisa Hallinger and Josefine Fager

Supervisor: Rick Middel  
Master Degree Project No. 2016:50  
Graduate School

## **Abstract**

Due to the fast changing market environment of today, with increasing globalisation, technological development, and steadily changing customer demand, research show that it is of significant importance to detect how companies use their resources in order to develop new products to ensure their future survival and prosperity. This qualitative case study provides insights on how portfolio management can enhance the decision-making and prioritization between development projects and the process of assessing components of risk and value potential of new products. The study aims to focus on a specific case within the Swedish bread industry and the purpose is to explore how the decision-making process regarding new product development within one of the major actors, Polarbröd, has developed over time and how it can be improved further. This gives insights on the company's product development and usage of portfolio management, and aims to highlight the complexity of the field and its connected issues of communication and understanding. The study concludes that Polarbröd would benefit from complementing their current portfolio management with a formal checklist for their risk and value assessment, in which the company would get a different, more holistic assessment. This would also make it possible for Polarbröd to conduct more accurate decisions by redefining their present definitions of risk and value. The study identifies value as the parameter that requests most attention in the checklist, since the current assessment at Polarbröd is inadequate. The risk assessment could beneficially be visualized through applying a model that illustrates the relation between different risk categories and portfolio categories, all to improve understanding and communication between the involved parties in the decision-making process.

**Keywords:** New Product Development, Portfolio Management, Decision-Making, Prioritization, Risk Assessment, Value Assessment, Food Production Industry, Bread Industry

## **Acknowledgement**

We would like to express our sincere gratitude to everyone who made this study possible. A special thanks goes to Polarbröd that hosted us during this project. We would like to thank our supervisor at Polarbröd, Stig Cornéer, who initiated the whole project and Sophie Everljung, who provided us with many good inputs regarding the product development and portfolio management efforts at Polarbröd. We would also like to thank our supervisor at the School of Business, Economics and Law at the University of Gothenburg, Rick Middel, for his guidance and support throughout the project. Furthermore, we would like to express our gratitude to all the inspiring and professional interviewees for sharing their valuable time with us and making this study possible.

# Table of Contents

<b>1. Introduction.....</b>	<b>1</b>
1.1 Background .....	1
1.2 Purpose and Research Questions .....	2
1.3 Delimitations .....	2
1.4 Disposition.....	3
<b>2. Methodology .....</b>	<b>4</b>
2.1 Research Design .....	4
2.2 Research Strategy.....	5
2.3 Research Method.....	5
2.4 Selection of Respondents and Projects .....	6
2.5 Data Analysis.....	7
2.6 Research Quality .....	8
2.6.1 Reliability .....	8
2.6.2 Validity .....	9
<b>3. Theoretical Frame work .....</b>	<b>10</b>
3.1 Characteristics of the Food Production Industry .....	10
3.2 Portfolio Management .....	11
3.2.1 Best Practices in Portfolio Management.....	12
3.3 Decision-Making in Portfolio Management.....	13
3.3.1 Methods for Managing Product Portfolios .....	14
3.4 Risk in Portfolio Management.....	16
3.4.1 Risk and Uncertainty .....	17
3.4.2 Types of Risk.....	17
3.4.3 Risk Assessment.....	17
3.4.3.1 Financial Valuation of Risk .....	18
3.4.3.2 Separating Risk and Value .....	18
3.4.3.3 Scoring Methods.....	18
3.4.4 Criteria for Decision-Making regarding Risk.....	18
3.4.4.1 Evaluating Market Risk.....	20
3.4.4.2 Evaluating Technical Risk .....	20
3.4.4.3 Evaluating User Risk.....	21
3.5 Value.....	22
3.5.1 Value Creating Assets.....	22
3.5.2 Value Creation .....	23
3.5.3 Measuring and Estimating Value .....	24
3.5.4 Criteria for Decision-Making regarding Value.....	25
3.5.4.1 Financial Value .....	25
3.5.4.2 Customer Value.....	26
3.5.4.3 Internal Value .....	26
3.5.4.4 Learning and Growth Value.....	26
<b>4. Empirical Findings.....</b>	<b>30</b>
4.1 Characteristics of the Bread Industry .....	30
4.2 Past Structure of the Product Development.....	32
4.2.1 Structural Characteristics .....	32

4.2.1.1 The PPS-Model.....	32
4.2.1.2 Organisational Structure and Distribution Arrangements.....	33
4.2.1.3 Consumer Categorization .....	34
4.2.1.4 Specific Project Examples.....	34
4.2.2 Decision-Making in the Projects.....	35
4.2.3 Risk Assessment of the Projects.....	36
4.2.4 Value Assessment of the Projects.....	37
4.3 Current Structure of Product Development & Portfolio Management.....	39
4.3.1 Structural Characteristics .....	39
4.3.1.1 Portfolio Management and applied Models .....	39
4.3.1.2 Benefits with Portfolio Management.....	41
4.3.1.3 Drawbacks with Portfolio Management .....	42
4.3.2 Decision-Making in Portfolio Management.....	42
4.3.3 Risk Assessment of the Projects.....	43
4.3.4 Value Assessment of the Projects.....	45
4.4 Concluding Remarks .....	47
4.5 Improvement Potential and Improvement Strategy.....	48
<b>5. Analysis .....</b>	<b>50</b>
5.1 Characteristics of the Bread Industry .....	50
5.2 Past Structure of the Product Development.....	51
5.2.1 Decision-Making of the Projects.....	51
5.2.2 Risk and Value Assessment of the Projects.....	52
5.3 Current Structure of Product Development & Portfolio Management.....	52
5.3.1 Decision-Making in Portfolio Management .....	53
5.4 The Overall Development at Polarbröd.....	62
5.5 Improvement Potential and Improvement Strategies.....	63
5.6 Concluding Remarks .....	64
<b>6. Conclusion .....</b>	<b>69</b>
6.1 Answering the Research Questions.....	69
6.2 Recommendations for Polarbröd .....	69
6.3 Suggestions for Further Research.....	71
<b>References.....</b>	<b>72</b>
<b>Appendix 1 - Interview Guide.....</b>	<b>78</b>

## List of Tables

<b>Table 2.1</b> Interviews at Polarbröd .....	6
<b>Table 3.1</b> Popular Portfolio Management Methods .....	16
<b>Table 3.2</b> Types of Risks .....	21
<b>Table 3.3</b> Types of Value .....	27
<b>Table 3.4</b> Types of Risk and Value .....	28
<b>Table 4.1</b> Risk Assessed at Polarbröd .....	45
<b>Table 4.2</b> Value Assessed at Polarbröd .....	46
<b>Table 4.3</b> Risk and Value Assessed at Polarbröd .....	47
<b>Table 5.1</b> Differences in Risk Assessment between Theories & Polarbröd.....	56
<b>Table 5.2</b> Differences in Risk Assessment between Theories & Polarbröd.....	60
<b>Table 5.3</b> Recommended Risk and Value Assessment at Polarbröd.....	68

## List of Figures

<b>Figure 1.1</b> Disposition.....	3
<b>Figure 3.1</b> Product Portfolio Categories .....	19
<b>Figure 3.2</b> Risk Weighted by Portfolio Category .....	20
<b>Figure 3.3</b> Value Creating Perspectives .....	24
<b>Figure 4.1</b> The PPS-model.....	33

# 1. Introduction

*This chapter provides a background to the purpose of this study. It introduces the topic and the project sponsor Polarbröd, as well as explaining the research questions, delimitations and the overall disposition of the study. The chapter will explain both the theoretical contribution and the practical contribution of the study.*

## 1.1 Background

Today, business is all about handling change and being responsive. Globalisation, technological development, and changing customer demand have transformed the business environment into a forum where intensive competition requires companies to quickly present new solutions and products. New product development (NPD) is a dynamic process that receives much attention today, due to its major effects on company performance (Erhun, Gonçalves & Hopman, 2007). However, developing new products impose much risk to the companies, often related to the market, the user, the technical solution, (Davis, 2002) or to the fact that the scarce resources of the companies are not sufficient. This makes the failure rate for many new products overwhelmingly high (Erhun, Gonçalves & Hopman, 2007).

The aspect of operating with limited resources could be managed within companies through applying portfolio management. This is a more holistic approach of assessing and allocating resources to a group of development projects in a more combined manner based on characteristics such as risk and value potential of the projects. Portfolio management allows companies to prioritize between projects, and can be considered as a manifestation of the business strategy. It indicates where and how investments should be made in order to create value for the company. The goals of portfolio management are, on a general level, to maximise the value of the portfolio, to create a strategic fit to the overall strategy of the business, and to balance the portfolio in terms of conducting projects of different character, risk and contribution (Cooper, Edgett & Kleinschmidt, 2001). On a specific level, to beneficially manage and combine risk and value in the portfolio, companies can achieve a desirable level of growth and improve their company performance (Day, 2007).

Polarbröd, one of Sweden's major bread manufacturers, finds the process of assessing and prioritizing between development projects complicated to manage effectively. An initiation effort of applying a portfolio management approach was made in 2015, but they still detect a need of enhancing this process even further to be able to improve their company performance. Polarbröd has been a family owned business from the start in 1879 and is still kept that way, resulting in a strong company culture and decisive way of managing the company. Their main operations are within Sweden, but a significant amount of export is also made to other countries within Europe (Polarbröd, 2016). Polarbröd continuously strives to fulfil the need and demand of their ever-changing customers and consumers with new products. However, in order to enhance the performance of the company, there is a need of making decisions and prioritizations between development projects differently in their

product portfolios. This concerns a combination of both short-term and long-term projects. By considering the risk and the value potential of the projects in the portfolios, this study identifies the critical aspects of the decision-making process for the portfolio management at Polarbröd with the aim of making their processes more efficient to enhance their company performance. As this study contributes with profound insights and understandings of the development of the decision-making process regarding product development and portfolio management for one of the largest companies within the Swedish bread industry, it also complements the existing theoretical research within the field.

## **1.2 Purpose and Research Questions**

The purpose of this thesis is to identify the critical aspects of risk and value for Polarbröd to assess, in order to more effectively manage their future portfolio decisions both from a short-term and a long-term perspective. The recommendations are constructed with the purpose of addressing the current needs and situation of the company, which ultimately will enable them to achieve a desirable level of growth. The study also aims to complement the existing research of the field by providing profound insights of the decision-making process regarding product development and portfolio management for one of the major actors within the Swedish bread industry, Polarbröd. Therefore, the study will be presented from three different time perspectives, a past perspective, a current perspective, and a future perspective, in order to highlight the development of the decision-making process and the impact of portfolio management on it, within the specific case organization. To be able to fulfil this purpose, we aim to answer the following research question throughout the study:

- How can Polarbröd enhance their future portfolio decisions in new product development?

The main question is complemented by two, more specific, sub-questions:

- What components of risk are necessary to consider for enhancing future decision-making in Polarbröd's product portfolios?
- What components of value are necessary to consider for enhancing future decision-making in Polarbröd's product portfolios?

## **1.3 Delimitations**

With the starting point in the need of Polarbröd to enhance their future decision-making process of NPD, we have chosen to limit our research to include the theories and aspects of portfolio management, with emphasis on decision-making and prioritization regarding risk and value. This excludes the perspective of investigating the entire NPD process and its formal way of selecting and terminating ideas and products, since this process is already well developed and refined at Polarbröd. The full NPD process is also well represented in the existing research and therefore, we do not consider our contribution to be as value adding within this field.



More specifically, we have chosen to limit our research within the area of portfolio management to the aspects of decision-making regarding risk and value due to the current inconsistent approach of managing this at Polarbröd. In developing new products, risk and value are two important components to make decisions around that will affect the performance of the company, and therefore we consider it to be beneficial for Polarbröd to have a more structured way of managing these issues. Having a better ability to make decisions in the product portfolio incorporates both a short-term and a long-term perspective, which is the scope of this study. This is beneficial to bear in mind for enhancing the fit of our recommendation to the needs of Polarbröd and their way of managing their business currently, but also in the future.

Furthermore, the research will mainly be focused around portfolio decisions of NPD for the Swedish market, as this is the market where Polarbröd has most significant presence in. Due to the specific characteristics of the food production industry, with highly heterogeneous demand, as well as varied regulations and legislations between countries, we consider this approach as rather limiting for the study, but nevertheless a reasonable start and foundation to develop a framework for their most important market.

## 1.4 Disposition

Figure 1.1 illustrates the disposition of the study and provides an overview of what the different chapters contain.

<b>Introduction</b>	<ul style="list-style-type: none"> <li>• Background, Purpose, Research Questions, Delimitations</li> </ul>
<b>Methodology</b>	<ul style="list-style-type: none"> <li>• Research Design, Strategy, Method, Selection of Respondents and Projects, Data Analysis, Research Quality</li> </ul>
<b>Theoretical Framework</b>	<ul style="list-style-type: none"> <li>• Portfolio Management and Practices</li> <li>• Decision-Making</li> <li>• Risk &amp; Value Assessment</li> </ul>
<b>Empirical Findings</b>	<ul style="list-style-type: none"> <li>• Past Structure of Product Development &amp; Decision-Making</li> <li>• Present Structure of Product Development, Portfolio Management &amp; Decision-Making</li> <li>• Improvement Aspects &amp; Strategies</li> </ul>
<b>Analysis</b>	<ul style="list-style-type: none"> <li>• Past Structure of Product Development &amp; Decision-Making</li> <li>• Present Structure of Product Development, Portfolio Management &amp; Decision-Making</li> <li>• Improvement Aspects &amp; Strategies</li> </ul>
<b>Conclusion</b>	<ul style="list-style-type: none"> <li>• Answers to Research Questions</li> <li>• Recommendations to Polarbröd</li> <li>• Suggestions for Further Research</li> </ul>

**Figure 1.1** Disposition

## 2. Methodology

*This chapter presents the applied methodology for the study. Aspects regarding research design, research strategy, research method, selection of respondents, data analysis and research quality are discussed.*

### 2.1 Research Design

This study is conducted as a case study performed at Polarbröd, consisting of a pre-study and a main study. The aim of the pre-study was to get an understanding of the company, its employees and the values and culture that drives the company forward. We detected their current systems, models, and mechanisms of how they manage their NPD process and portfolio management. The aim of the main study was to detect the past, current, and future way of developing new products at Polarbröd, with a focus on portfolio management and how they assess and make decisions regarding risk and value of the projects in their product portfolios.

Furthermore, the case study also includes a theoretical framework, which summarizes the most important research on the topics of portfolio management and connected decision-making with regard to risk and value assessment. These theories provide an academic perspective to compare and combine with the empirical findings that we made at Polarbröd, to ultimately answer the stated research questions. The aim of the chapter Theoretical Findings is to introduce the topics in a proper way, give the study academic rigor and to create a solid foundation for the interview questions that we used for conducting interviews later on in the process of the study. The chapter is also used as a benchmark to compare Polarbröd's situation with, and in the end, for us to be able to construct suitable recommendations for the company to implement in their operations.

Formally defined, a case study is characterized by its intensive form of interviewing people to give insights on a specific case, for example an organization (Bryman & Bell, 2015), which is coherent with the case of Polarbröd in this study. Furthermore, we can conclude that this is an embedded single case study, since our aim is to make a profound investigation by our data collection and analysis, to be able to answer the specific research questions that we have for this study (Yin, 2011). To ensure academic rigour of the study we based the interview questions on the insights of the chapter Theoretical Findings. We also integrated information, impressions and opinions that we gathered during the pre-study, to ensure that the interviews stayed in line with the needs, as well as the objectives and strategies of Polarbröd. By using this approach, we were able to ask more relevant questions to the employees, and make more accurate judgements in the analysis, which ultimately helped us to answer the research questions and thus provide better recommendations to Polarbröd.

## **2.2 Research Strategy**

We applied a qualitative research strategy throughout the study, to be able to ensure collection of deeper and more detailed information. A qualitative research strategy can be explained by the emphasis of words rather than quantification in the collection and analysis of the data (Bryman & Bell, 2015). The qualitative research strategy was shown through the interviews that we conducted with key employees at Polarbröd, where the focus was to gain extensive knowledge of their portfolio management. We considered a qualitative research strategy to be appropriate to use in order to answer the research questions, as this approach provides an opportunity of capturing the complex social reality of the company rather than measuring it in absolute terms, since the employees and their interpretations compose important components of the organisation. In general, we do not find much value in counting, measuring, or analysing statistical data in this study, but instead we aim to gain a detailed understanding of the mechanisms within Polarbröd (Bryman & Bell, 2015; Padgett, 2008).

Moreover, due to the qualitative research strategy of the study an inductive approach was emphasized (Padgett, 2008), which means that by our findings and observations we tried to establish a theory rather than to test an already established one. An inductive research approach can also be referred to as an iterative process in which the researcher is moving back and forth between theory and data (Bryman & Bell, 2015). We considered an inductive approach to be suitable since the aim of this study was to gain insights on what risk and value assessment, and its connected decisions in Polarbröd's portfolio management, that would be beneficial for them. Therefore, we needed to gain practical insights of the organisation and not solely proceed from existing theories, to ensure customized recommendations.

## **2.3 Research Method**

In order to collect data to answer the research questions we considered it important to use information from different sources, both primary and secondary. By doing this, we could make sure that we covered different perspectives of the topics and thereby we managed to create a more comprehensive understanding of NPD and portfolio management at Polarbröd.

As previously stated, we initially started to collect secondary data in the form of existing research within the field with the purpose of acquiring a background of the different topics, in particular portfolio management. Thereafter, we mainly collected primary data in form of conducting semi-structured interviews to cover three different time perspectives of the portfolio management at Polarbröd, a past perspective, a current perspective, and a future perspective. Semi-structured interviews comprise scheduled series of general questions and allow follow-up questions (Bryman & Bell, 2015). By applying this approach we could in a flexible manner get a detailed understanding of how Polarbröd used to operate, how they operate today, and how they want to operate in the future and at the same time get reflections on these perspectives from the interviewees. Conducting fairly open interviews enabled us to gain a deeper understanding of the underlying motives regarding the past and current system, the current needs and the future aspirations of Polarbröd. By asking open questions we could also make sure that we got a comprehensive and holistic understanding of the organisation,

which ultimately helped us to ensure that our recommendations were in line with the objectives and strategies of Polarbröd. The interview-guide that we used for the interviews is to be found in Appendix 1.

## 2.4 Selection of Respondents and Projects

The general aim of conducting the case study at Polarbröd was to investigate how they operate, strategize and make decisions regarding their NPD and portfolio management. More specifically, we wanted to detect how they manage their portfolio of development projects and how they assess and handle risk and value in these projects. We wanted to detect a pattern of the development process over time and therefore we investigated past and current development projects at Polarbröd from the aspects of how they manage risk and value. Based on the findings we also wanted to detect areas of future improvements for Polarbröd. The sample of projects that were analysed was of different character regarding risk and value in order to make the sample representative of a diverse portfolio.

In order to collect data of past and current projects as well as insights on improvement areas, comprehensive interviews were conducted with individuals involved in the development process of the projects. The interviews were conducted with key employees who possessed general insights on Polarbröd's way of working with portfolio management, as well as with employees who had insights on the specific NPD projects from the aspect of how decisions were made regarding risk and value potential of the projects. The level of involvement and knowledge of the NPD process varied among the respondents, which we found valuable to the study since it created a better transparency and a more holistic view of how they work with product development at Polarbröd. Although, a common denominator among the respondents was that they are all in a position of responsibility, managing a specific department or area within Polarbröd, and all of them have significant experience and knowledge within the company and the industry. This provided valuable insights for our study. In total, eight interviews were conducted with employees at Polarbröd and all of them were conducted via Skype due to geographical distances. A complete overview of the interviews with the different managers is to be found in Table 2.1 below.

**Table 2.1** Interviews at Polarbröd

Interviewee	Position	Date
<b>Sophie Everljung</b>	Product Development Manager	16-04-15
<b>Cathrine Högström</b>	Marketing Manager	16-04-21
<b>Carina Roos</b>	Sustainability Manager, former Product Development Manager	16-04-07
<b>Stig Corneér</b>	Controller	16-04-08
<b>Björn Hägg</b>	Sales Manager	16-04-15
<b>Johan Karlsson</b>	Food Engineer	16-04-18
<b>Lillian Nilsson</b>	Site Manager at Älvsbyn Bakery	16-04-08
<b>Anders K. Johansson</b>	Marketing Director	16-04-14

## 2.5 Data Analysis

The empirical data that we analysed were focused around the practical insights of the past and current development projects as well as a future improvement potential perspective. This data was gathered in the interviews with employees at Polarbröd. Since the analysis of data in a case study can vary significantly, depending on the specific characteristics of the study, there is no universal way of analysing it (Yin, 2011). However, a case study analysis is characterized by that it provides a holistic assessment of the specific case unit, where the content is thoroughly examined. The different parts within the specific unit are both considered as a whole and in relation to each other (Padgett, 2008).

As our purpose clarifies, the study was conducted to give profound insights to a specific company within the Swedish bread industry, to present their development of decision-making and the effect of portfolio management on their NPD process, in order to complement and extend the existing research of the field. By the study we aim to answer our specific research questions rather than creating a general understanding, and therefore we have made the analysis intensive, since we are examining a specific case thoroughly and comparing it to existing research (Bryman & Bell, 2015). This has been a way of generating new theory, hence using an inductive approach.

We consider the process of analysing the data iterative, meaning that we have moved back and forth between data and theory (Bryman & Bell, 2015). This was evident while conducting the interviews and simultaneously interpreting the meaning of the answers to improve the selection of interview questions as well as improving our own understanding and knowledge of the topic throughout the process. This helped us in asking more accurate questions to the respondents at Polarbröd, since analysing the answers gave us valuable insights that we wanted to gain deeper knowledge of and explanations for. As our understanding of the topic increased along the way, it was easier to understand the respondents' answers in the end of the study compared to the answers received earlier on in the process. This tendency constituted a risk of getting a different outcome if we would have conducted the interviews in a different sequence. In order to minimize this risk we recorded all the interviews, transcribed them and read their answers several times. This made it possible to discuss eventual uncertainties and interpretation differences of the findings, to make sure that both of us got the same information from the answers. If we experienced something as unclear, we also concluded with the individual respondents that we had interpreted his or her answers correctly. When we founded potential gaps in the information that we collected in the interviews, we emailed additional questions to the respondents to get a comprehensive picture of the situation. This became a vital part in the process of interpreting and analysing the answers, at the same time as we developed our understanding of the topic, and the need and situation of Polarbröd.

In combination with having a direct communication with the respondents, we also coded our answers according to the different subjects that we had covered in our Theoretical Findings. This made us create a higher internal reliability and reduce biased coding. In general, coding

refers to the practice of dividing a larger amount of collected information into conceptual bins, and can be used for elaborating interpretive procedures connected to the development of theory. Preferably, coding splits the information in an analytically applicable manner in order to lead to additional questions regarding the data (Coffey & Atkinson, 1996). This was an important part of our analysis, since it provided a structure for us to manage the large amount of data that we collected. We started off by taking notes, recording and discussing the outcomes of the interviews, and thereafter we categorized our findings according to the different theories that we included in the chapter Theoretical Framework, namely portfolio management, decision-making, risk, and value. In order to make the information that we collected in the interviews more manageable, we also constructed subcategories within these broader categories.

## **2.6 Research Quality**

In order to ensure good quality of the study, reliability and validity are important aspects to assess (Bryman & Bell, 2015). This is the content discussed in the following sections.

### **2.6.1 Reliability**

Reliability concerns if the results of a study is repeatable or not, and it is often related to the question of whether or not the measures that are devised for concepts in business and management are consistent. Reliability is heavily emphasised in quantitative research, because one of the main purposes of these studies is to create a stable and repeatable result (Bryman & Bell, 2015). Even though this study is qualitative, it is conducted as a case study. This contributes to an uncertain situation regarding the reliability of the study, since a qualitative case study aims to, in an opinion-based way, shed light on a highly specific situation rather than analysing a general situation with numerical and objective data. Therefore, we must conclude that the reliability of this study is considered to be fairly low.

A closely connected research criteria to reliability is replication. This means that the researcher must describe his or her way of conducting the research in such a transparent way that it would be possible for another researcher to replicate the study. This might for example be beneficial if there exists any reason for doubting the result in the first place. Although, for research within the field of business it is not common to be able to replicate research methods, as the research often reflects socially complex situations (Bryman & Bell, 2015). For enhancing the replication of this study, we have throughout the whole process ensured good transparency by stating and providing clear documentation of our methods and assumptions. Nevertheless, achieving the same result as for this specific case study might be difficult, since it is based on the specific opinions and insights of the respondents of this particular case.

### **2.6.2 Validity**

The most critical aspect to highlight regarding research quality of this study is the validity, which concerns the integrity of the produced conclusions. Validity can be considered from different perspectives, such as internal validity and external validity (Bryman & Bell, 2015).

Internal validity is closely connected to the concept of causality, and concerns the question of whether a conclusion that incorporates a causal relationship between at least two variables can be considered as solid. The researcher tries to detect if the independent variable affect the dependent one in a certain way to imply that there is a relationship between them, and if this relationship is caused by the independent variable alone, or if in fact something else is causing the effect (ibid). For this study we conclude that the internal validity is low, due to the high complexity of the situation that we investigate and the relationships that we find cannot be explained by a causal relationship.

On the other hand, external validity concerns if the results of a study are possible to generalize beyond the specific context of the study. Here, it is of importance how people or organizations are selected to participate in the research. Due to the focus on a single organisation in this study, the external validity and the generalization of the study might be considered as low. Many researchers within the field of qualitative studies consider the similar to the concept of transferability, if the findings are applicable to other contexts. Even from this approach, we must consider the transferability as low for the study due to its specific character. Although, it might be possible to find a particularization rather than generalization for the study, where a theoretical generalization of the case study can be generated to a limited degree. In order to enable this, it is important for us to assure transferability in our research, meaning that we throughout the process clearly state and motivate the assumptions that we make for example how we selected our respondents. By that, the research will also become more valuable in an academic setting (Bryman & Bell, 2015).

### **3. Theoretical Framework**

*This chapter provides an overview of the food production industry and highlights relevant research in the field of portfolio management. In addition to the general theoretical discussion of portfolio management, the chapter concludes more specific theories of how decision-making within portfolio management works, and how decision-making regarding risk and value of development projects practically is manifested.*

#### **3.1 Characteristics of the Food Production Industry**

The food production industry is initiated in the excavating of materials from the natural environment. It is typically described as a mature industry with low amount of R&D investments (Costa & Jongen, 2006) and the industry is historically characterized by its relatively slow development (Kiple, 2007). However, through the past decades the production, distribution and consumption of food have altered and gradually become industrialized (Bonanno et al, 1994; Roberts, 2008; Ward & Almås, 1997; Watts & Goodman, 1997; Wilkinson, 2002). As food production is a highly local process it is affected by many conditions, such as climate, soil and socio-cultural conditions. Nevertheless, there are evident trends of increased globalization when it comes to distribution and consumption of locally produced food. For the wealthy consumer, with access to a wide supply in the supermarket shelves, permanent global summertime has today become more of a reality (Blythman, 2004). Today, the industry is among the most regulated, subsidized and protected, and the state typically has an immense impact on its development. The regulations, subsidies and protection vary between countries as a consequence of national concerns (Dicken, 2011).

The food production industry is comprised by different types of companies, providing a large variety of products to the market. The majority of the products are delivered through retailers and the margins are in general relatively low (Hingley & Lindgren, 2004; Trail & Grunet, 1997). Due to increased consumer awareness, more pressure and demands are put on the food producing companies (Weston & Chiu, 1996) and the development of the market is of consumer pull. The consumer's demand and buying patterns have direct impact on NPД, simultaneously as it influences the product supplies that the retailers provide on the shelves. The shelf space per se gives the retailers a higher bargaining power in the negotiation with the producing companies in the supply chain (Hingley & Hollingsworth, 2003).

Today it is evident that how consumers consume food have become more complex, and what consumers choose to eat is a mixture of diverse factors, such as taste, religion, culture, health concerns, lifestyle, income, and ethical standpoint. Due to the varying demands of food among consumers, there are significant challenges for the food producers to address. This is typically shown in that the industry is becoming increasingly segmented with a large variety of products, and rapid development of new offerings. The companies need to keep up with the fast changing dietary fashions and trends since what the consumers' request today might not be what they prefer tomorrow (Dicken, 2011). Hereby, the requirement of intensive consumer research and rapid development of new products are important for the food producing companies, to ensure future shelf space. However, research show that few



companies within this industry actually manage to launch products that gains long-term acceptance and successfulness (Rudolph, 1995). Due to the intensity of consumer trends and the industry's need of constantly providing new products, external resources are for many food producing companies necessary to take advantage of in order to enhance the innovative processes (Anderson & Woolley, 2002).

### **3.2 Portfolio Management**

Due to the fast changing market environment with steadily shorter product life cycles, changing technologies, and hyper competition, it becomes critical how companies spend their development resources to ensure future survival and prosperity. An aspect of increased importance, especially for the senior management of companies, is portfolio management of development projects. Portfolio management is a manifestation of the business strategy and it indicates where and how investments should be made in order to create profitability and growth. The goals of portfolio management is to maximise the value of the portfolio, to create a strategic fit to the overall strategy of the business and to balance the portfolio in terms of conducting projects of different character, risk and contribution (Cooper, Edgett & Kleinschmidt, 2001). Therefore it is both about “doing projects right” and “doing the right projects”, which is a complex process to manage since organisations operate with a limited amount of resources (Hunt & Killen, 2008). The increased importance of portfolio management can also be explained by the fact that if it is not managed in a good way, the company will have to expect negative effects of the new product efforts (Cooper & Kleinschmidt, 1996). Literature highlights that portfolio management is complex and few companies have a formal process, of which the overall business strategy is integrated, to ensure successful and efficient product portfolios (Khurana & Rosenthal, 1997). Portfolio management can formally be defined as:

A dynamic decision process, whereby a business's list of active new product and R&D projects is constantly updated and revised. In this process, new projects are evaluated, selected and prioritized, existing projects may be accelerated, killed or de-prioritized and resources are allocated and reallocated to the active projects. The portfolio decision process is characterized by uncertain and changing information, opportunities, multiple goals and strategic considerations, interdependence among projects, and multiple decision-makers and locations. The portfolio decision process encompasses or overlaps a number of decision-making processes within the business, including periodic reviews of the total portfolio of all projects (looking at the entire set of projects, and comparing all projects against each other), making go/kill decisions on individual projects on an on-going basis (using gates or stage-gate process), and developing a new product strategy for the business, complete with strategic resources allocation decisions (Cooper, Edgett & Kleinschmidt, 1998; Griffin, 1997; Graves, Ringuest & Case, 2000; Ringuest, Graves & Case, 1999; Roussel, Saad & Erickson, 1991).

Cooper, Edgett and Kleinschmidt (2001) argue that there are eight key reasons, stated by senior management, why portfolio management is of significant importance to companies. The most commonly mentioned reason is financial motives including maximizing the return of the portfolio, but also maximizing the productivity of the projects and achieving the overall financial goals that the company aims to achieve. Other key reasons include maintaining a competitive positioning in the market, allocating resources efficiently, addressing the strategic issue of merging project selection and business strategy, focusing on

the specific number of projects, achieving a balance between short-term and long-term and high-risk and low-risk projects, communicating prioritization and providing better objectivity in the project selection.

### **3.2.1 Best Practices in Portfolio Management**

Applying a strategy for maximizing the outcome of such resource allocation can be defined as a best practice (Hunt & Killen, 2008). A best practice in portfolio management is linked to improved business performance and can differ widely (Camp, 1998). It can be applied to a range of different industries and different portfolio types and cannot be defined as a specific process or method, but rather an activity that can be drawn from a common pool of methods and tools. Evidently, these practices are most efficient when they are customized to a specific situation (Loch, 2000; McDonough & Spital, 2003; Phaal, Farrukh & Probert, 2006).

The best practice of portfolio management is a rapidly growing field of research, simultaneously as the awareness of portfolio management among companies is growing. The main part of the existing literature is focused around software-based optimisation techniques, which are difficult to apply in reality. There is a growing body of research that concerns methods that are used by companies in practice. These practices often show a mix between several tools (Killen, Hunt & Kleinschmidt, 2007), but they also show more management-friendly tools that can be combined (Coldrick et al., 2005; Cooper, Edgett & Kleinschmidt, 2001). The best practice literature aims to improve the understanding of these methods and tools and to give managers an overview in how to use them to achieve their organisational goals (Hunt & Killen, 2008).

Lee et al. (2008) provide an example of how technology roadmaps can be used as a best practice in the process of portfolio management. A technology roadmap is a well-documented tool that can be used for making long-term plans for different technology and product strategies. Thereby, it becomes a helpful tool in enhancing company performance. Although, this practice is rather new in the context of portfolio management and the authors provide insights of how the tool is used in the project selection and planning processes in a Korean government R&D program.

In 2004, Cooper, Edgett, and Kleinschmidt presented a study that provides further insights on specific best practices. They show a number of practices that highly affect the performance of a selection of companies. The practice that was found to influence performance the most was to have portfolios that contain high-value development projects, meaning projects that yield more revenues relative to other projects in the portfolios, and thereby contribute to a better overall company performance. The study showed that successful companies had a larger fraction of high-value projects in their portfolio compared to less successful companies where an opposite situation was present.

Another practice of significant importance was achieving a balance between long-term and short-term projects, as well as high-risk and low-risk projects, in the different portfolios. The study showed that companies that manage to find this balance yielded better company

performance, in comparison to those companies who had difficulties on this aspect. As a third practice, the authors highlight the allocation of resources to different projects. They conclude that resource allocation reflects the overall business strategy to a large extent, and is therefore of major importance. The study provides evidence on that successful companies managed to achieve strategic alignment between their business strategy and the priorities among the development projects in a beneficial way. A trusted method for allocating resources is to construct strategic buckets for the portfolios to make the situation more foreseeable (ibid).

The fourth practice that was discussed in the study regarded ranking and prioritizing between projects in the portfolio. This is done to eliminate projects of poor quality and potential, and instead allocate the resources to more profitable projects. Companies that performed better had a prioritization system compared to companies that performed worse. As a fifth best practice to achieve successful portfolio management was identified as the importance of creating balance between the number of new products and the available resources of the company. It is considered to be the task of the management to distribute the available resources to where the demand for it exists, and in top performing companies this was handled in a beneficial way (ibid).

The sixth best practice was identified as the importance of alignment between the different projects and the company's objectives and strategy. This aspect implied considerable differences between the best performing and the worst performing companies. As a final best practice, the authors highlight the need of possessing a formal portfolio management system to be able to select the right projects and to allocate necessary resources to them. Evidently, many of the worst performing companies did not have such system, simultaneously as the best performing companies did (ibid).

From a more general perspective, Christiansen and Varnes (2008) present a different definition of best practice in the product portfolio management process. While taking a step back from the aspects of processes and structures for product portfolio management, the authors put emphasis on sociological impacts and the influence of the social environment and the human nature, which often becomes disregarded in practice. In order to make suitable decisions and to ensure effective product portfolio management, they argue that it is important to be aware of that portfolio performance is affected by how the decision-makers comprehends, uses and apply the structures, models and methods in these processes. The identity and the actions of the people involved in the decision-making will come to be influenced by several aspects, such as formal rules and systems, organizational context, observations of others, as well as organizational learning.

### **3.3 Decision-Making in Portfolio Management**

The process of developing new products impose many risk and value creating situations, which in combination with the fast changing environment and its external pressures constitutes a highly complex reality for companies. Taking these aspects into consideration, a crucial part of managing a product portfolio is about making necessary decisions, to combine

projects in the portfolio that will keep the risk on a manageable level and enhance the value potential of the projects. This requires an effective decision-making process for evaluating, prioritizing and allocating the limited resources of the company in the best possible way between the projects. Since this process determines the future products of the company, a rapid and sound decision-making system in combination with sharing information across the company's departments is necessary. Such a system should enable to prioritize between projects considering an optimal balance between profit and risk, between short-term and long-term projects, and between growth and revenue. As a result, it will be possible to guarantee a proper balance among the selected NPD projects and effective use of limited resources of the company (Oh, Yang & Lee, 2012).

Effective portfolio decisions has shown to be an outcome of the interaction between three types of decision-making processes that managers use; evidence-based, opinion-based and power-based decision-making. Evidence-based processes concerns collecting the right information from a technical, financial and market perspective where especially deeper market insights have shown to be critical. The market insights can create a comprehensive understanding of the customers, stakeholders, and the market on an aggregated level for the company. As the evidence-based collection of data seldom is complete or precise, the opinions and the power-bases of the people making portfolio decisions will also have an impact in the decision-making process. Opinion-based processes concerns the need of gathering data from multiple functions of the company and thereby enhancing the portfolio decision-making through tight cross-functional collaboration and sharing of diverse knowledge. Nevertheless, power-based processes involves the importance of having a portfolio mindset where the managers of the company have knowledge in detecting and resolving possible bottlenecks in the development pipelines of the products in the portfolios. When the managers are experts of a specific field, and are operating in the interest of the firm and the stakeholders, decisions based on these processes can be effective and contribute with successful new products (Griffin et al., 2011).

Simply by applying the approach and mindset of portfolio management, NPD strategies can be realized by developing roadmaps for both products and technology, with the purpose of linking the business strategy to the technology planning. These decisions can be made on a long-term or a short-term basis and can affect strategic investments as well as resource allocation, in order to achieve different business goals. In conclusion, it is a highly complex process to be able to build a strategic decision-making process for a NPD portfolio. However, there are many methods to use in the process (Oh, Yang & Lee, 2012).

### **3.3.1 Methods for Managing Product Portfolios**

There is an extensive selection of research on how it is possible to analyse, prioritize, and make decisions in project portfolios. In conclusion, this available research can be divided into three different categories. The first category is a prioritization approach, in which the expected outcomes of projects are evaluated and projects are prioritized based on them. This category includes comparative methods, such as scoring methods (Martino, 1995), Q-sort (Sunder & Mandakovic, 1986), and analytical hierarchy processes (Brenner, 1994), as well

as financial analysis methods, such as net present value (NPV) (Chun, 1994) return on investment (ROI) (Martino, 1995) and option pricing theory (Perlitz, Peske & Schrank, 1999). These methods are simple and useful, but are limited in the way they manage the portfolio balance and it is also shown that it can be unbeneficial to solely rely on financial methods for managing a product portfolio (Cooper, Edgett & Kleinschmidt, 2004). Nevertheless, the financial methods are still the most widely used ones (Cooper, Edgett & Kleinschmidt, 2001).

The second category is a mathematical optimization approach. The methods of this category try to optimize various objective functions within the constraints of resources, project logic and dynamics, technology, and project related strategies. They include a range of methods, such as linear, nonlinear, integer, dynamic, goal, and stochastic mathematical programming methods (Heidenberger & Stummer, 1999). The mathematical optimization approach is, from a theoretical perspective, the best approach to use and a number of techniques have been suggested to model practical portfolio selection processes, considering partial funding, and the interrelation of projects and their periods (Beaujon, Martin & McDonald, 2001; Dickinson, Thorton & Graves, 2001; Kester, Hultink & Lauche, 2009).

Although, both the prioritization approach and the mathematical optimization approach can be contributing, there is much critique raised against these approaches. Researchers mean that these methods fail to incorporate the uncertainty of the decision-making of innovation portfolios and that the usage of the models becomes limited since they apply the same evaluation criteria to all projects during the decision-making process, even though other selection criteria beneficially could be applied to match the characteristics of the projects. The drawback of these methods is the unreliability of the results, a problem attributed to the shortage of correct input data for calculating the optimized values (Oh, Yang & Lee, 2012).

The third and last category is a strategic management approach. This approach overcomes the limitations of the prioritization approach and aims to create a balanced portfolio. Examples of applicable methods include bubble diagrams, portfolio maps, and strategic bucket methods (Balbontin et al., 2000; Wang & Hwang, 2007). It also enhances the relationships between the NPD projects and strategy. For instance, research suggests that differences between the most innovative companies and less innovative companies depend on how well they define and utilize strategic buckets (Barczak, Griffin & Kahn, 2009).

According to a study by Cooper, Edgett and Kleinschmidt (2001) the most popular methods for managing product portfolios in companies today are financial methods, to use business strategy as the basis for resource allocation, bubble diagrams and portfolio maps, scoring models and check lists. These methods are presented in Table 3.1 as the proportion of usage among the companies and the proportion among the companies that consider the specific model to be of significant importance. Nevertheless, these methods are considered to be the most popular, which does not equal to the best or the most effective methods to use.

**Table 3.1** Popular Portfolio Management Methods (Cooper, Edgett and Kleinschmidt, 2001)

Method	Characteristics	Usage, %	Significant Usage, %
<b>Financial Methods</b>	Profitability, return metrics, payback period, and productivity indexes	77,3	40,4
<b>Business Strategy</b>	Resource allocation through e.g. strategic buckets	64,8	26,6
<b>Bubble Diagram &amp; Portfolio Maps</b>	Plot projects on an X-Y map, showing characteristics in relation to other projects	40,6	5,3
<b>Scoring Models</b>	Rate and rank projects on a number of questions or criteria	37,9	13,3
<b>Check Lists</b>	Evaluation based on yes/ no questions	18,0	3,0

### 3.4 Risk in Portfolio Management

Managing risk is a critical aspect of portfolio management as it enables companies to address emerging opportunities and threats that they are facing. By applying a portfolio approach in the NPD process the companies do not manage the risks of single projects independently (Olsson, 2008), but instead they manage a number of projects simultaneously in order to maintain efficiency and flexibility. Due to the dependencies among the projects, new risks emerge additionally to the risks of a single project (Project Management Institute, 2008). Therefore, a more holistic, portfolio-wide management of risk is beneficial for the company (Olsson, 2008).

Even though product development and the growth it can result in is of major importance for companies today, evidence show that the major part of development projects in portfolios of companies still is of smaller scale and less risky character. This rarely generates the type of growth that the companies seek and simultaneously as the general growth initiatives raise, there is evidence of that between the years of 1990 and 2004, the fraction of innovations in product portfolios dropped from 20,4 percent to 11,5 percent (Cooper, 2005). By classifying the innovations or development projects into “big is” and “small is”, differences between these project types can more easily be managed. Big is represents the risky, large projects. Those projects aim to drive the company into new markets or new technologies and give competitive advantages to the company in comparison to its competitors. If successful, these projects can contribute with significant revenues. The small i projects are necessary for continuous improvement but do not contribute with any competitive advantage and can thereby not generate any significant profit opportunity to the company. The aversion to conduct big i projects is mainly based on the assumption that the projects are too risky and that an eventual profit that could be generated will appear too far in the future. But taking these actions can strangle growth and deteriorate the efforts of the company to balance their NPD portfolio in order to manage risk in a structured way (Day, 2007).

### **3.4.1 Risk and Uncertainty**

A common mistake made by managers involved in the decision-making process within companies is to confuse the terms risk and uncertainty. The concepts are closely related per definition, but the meanings are not synonymous. Both uncertainty and risk is incorporated into the development of new projects in the product portfolio. However, the characteristics of the concepts differ (Szwejczeniowski & Mitchell, 2008). Uncertainty resists quantification and can therefore not be put into probabilities or scenarios to be addressed and managed, while risk on the other hand is quantifiable and manageable (Davis, 2002). Therefore, developing products can include both concepts. Risk is actively assessed and effort is put into mitigating and managing it, simultaneously as uncertainty is present on an overall level in the projects, which is important to be aware of. Depending on the different phases of the project and the type of risk, it is managed in different ways with the aim of achieving a desirable result of the project (Szwejczeniowski & Mitchell, 2008).

The reason for assessing the risk level of projects is to construct a portfolio that combines projects with different types and levels of risk, in the best possible way to achieve the desirable performance for the company. Each project needs to be ranked and compared to the other ones simultaneously as the level of uncertainty is incorporated, in order to work as a good decision-making tool for the company (Szwejczeniowski & Mitchell, 2008).

### **3.4.2 Types of Risk**

There are three major types of risk for companies to consider; marketing risk, technical risk, and user risk. The presence of the different types of risk varies with the type of industry and technology. Even if the risks are not measured and addressed in absolute terms, they still have an implicit impact on the performance of the company. If they do not contribute to improved commercial achievement, they can create a solid understanding of why the products fail (Davis, 2002). From a general perspective, this addresses the complexity of developing new products.

### **3.4.3 Risk Assessment**

In order to ensure successful NPD and portfolio management, the different types of risks need to be assessed. From a general point of view, there are three possible ways of addressing them (Cooper, Edgett & Kleinschmidt, 1998). The first one is to include the risk in the financial valuation of a project. This could for example be through estimating the probability of success or failure of the new projects, and often risk is illustrated as a price. The second way to address risk in a portfolio is to hold risk and value separated and decide upon a portfolio that combine projects with different types of risk and value in a beneficial way (MacMillan & McGrath, 2002). The third way of addressing possible risk in a portfolio is to use a scoring method that aims to combine risk and value in a judgemental way (Martin, 1994). The following paragraphs will explain these methods in a more detailed manner.

### **3.4.3.1 Financial Valuation of Risk**

For a project that is expected to proceed in a single phase without various decision points the risk can simply be included in the financial valuation by multiplying the expected income by the probability of success. As the costs of the project are unchanged, the result becomes a reduction in the forecast of NPV (Brigham & Erhardt, 2002). Such an approach leads to the possibility of undertaking real options valuation of projects and therefore to the financial valuation of risk preventative measures (Antikarov & Copeland, 2001; Razgaitis, 2003).

### **3.4.3.2 Separating Risk and Value**

An alternative approach in addressing portfolio risk is to review risk and value as two factors to consider separately. Typically, this implies that projects are displayed on a two-dimensional matrix or bubble diagram. The size of the bubbles can visualize the expenditure required and colour of the bubbles can for example be used to show how close each project is to realization. The bubble diagram is a tool used to understand the portfolio, not a decision-making tool in itself. Generally, it is desirable to have a mix of low-risk and high-risk projects in the portfolio to create a balance, but ultimately it is left to the management to decide on the exact combination of the two (Roussel, Saad & Erickson, 1991).

### **3.4.3.3 Scoring Methods**

Scoring methods are especially useful in the early stages of the NPD process when financial information is unreliable or unavailable. Projects are evaluated against a range of criteria that are important to the organisation or are believed to be related to success, such as fit with corporate strategy, use of core competencies, competitive differentiation, market growth, and competitive intensity. It can also be applied to estimate the expected NPV of a new project (Davis, 2002). This approach is similar to the balanced scorecard (Kaplan & Norton, 1992). Anchored scales are often useful (Cooper, Edgett & Kleinschmidt, 2001; Davis et al., 2001), which provide statements of guidance for each of the analysed factors. For instance, what constitutes high market growth or medium competitive intensity in the context of the company. This method takes some of the subjectivity out of the process and helps to align the scores from the various participants.

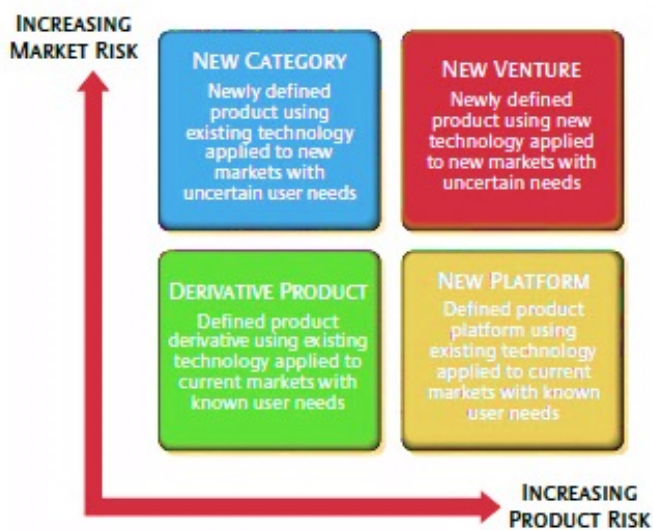
Scoring systems have a number of advantages over financial analyses when used in the early stages of projects. These advantages include bringing a wider range of relevant considerations into the decision, avoiding dominance by uncertain financial data, providing useful focus for a broader discussion of each project, and allowing the use of learning from other projects and industries. In this approach, risk is implicit in the scoring factors rather than expressed deliberately (Szwejczewski & Mitchell, 2008).

## **3.4.4 Criteria for Decision-Making regarding Risk**

As the product development process often is visualized as an unstable black box that seldom provides results that exceeds the expectations of the business, a robust product development process can make the inherent risks manageable and understandable. NPD portfolios can be divided into four categories, as a function of market and product risk, and the estimated return and chances for successful launch of a new product (Figure 3.1). The first category,

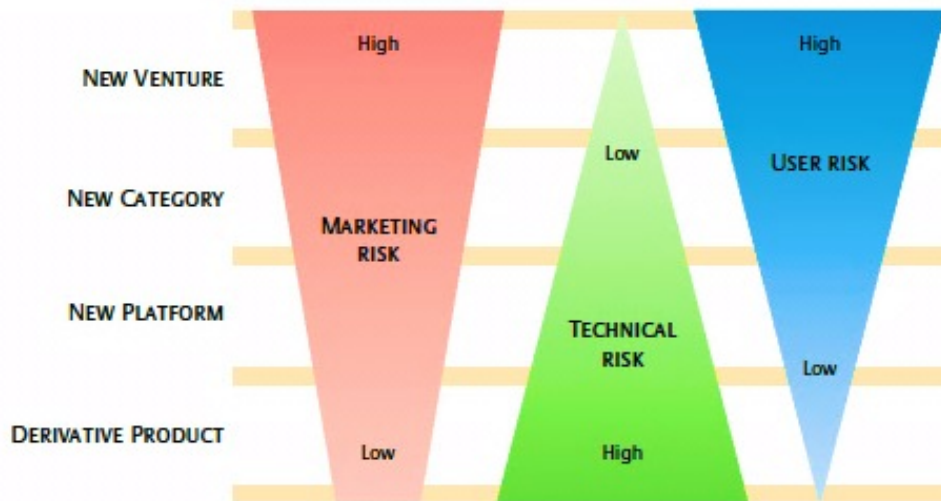


new ventures, is products that are new to the world and that create new markets. The second category concerns new categories, which involves products that are new to the company in form of new product lines that aims to reach an already existing market in which the company does not have any current operations. The third category, new platforms, comprises new additional products to already existing product lines that often are of a more inventive character. These platforms construct a foundation for future derivative products when enhanced market knowledge, new technology, and manufacturing expertise become possible to capture and take advantage of. The fourth category involves derivative improvements and revisions to already established products. These improvements or revisions can for instance include cost reductions (Davis, 2002).



**Figure 3.1** Product Portfolio Categories (Davis, 2002)

In order to better understand the risks that affect the probability for success, the four categories of projects provide an important starting point in the assessment of new projects and in future portfolio decisions. Through examining the different types of risk from the perspective of the four categories, and also taking into consideration the specific industry and technology, the company can receive useful indications of what the most prominent risk is for a specific product and thereby also evaluate the probability of commercial success. This is clearly visualized in Figure 3.2, where for instance the technical risk is insignificant in new ventures, while most often it is the absence of user or market comprehension that contribute to the failure of the new product. On the other hand, when it comes to the aspect of derivative products the market and the users are often well understood, but instead it is the new technology and the capacity of the company to boost the features of the product and decrease the costs that determines the success of the new product (ibid).



**Figure 3.2** Risk Weighted by Portfolio Category (Davis, 2002)

#### 3.4.4.1 Evaluating Market Risk

Market risk is included in all parts of the value chain and affects the possibility for a new product to be attained by the potential customers. Elements that for instance include the capabilities of the sales force, distribution channels, manufacturing capabilities, and customer support, must be understood and evaluated by the company in order to ensure that no gaps exists that could influence the probability of successfully launching the product to the market. Particularly, the company also need to evaluate its current presence in the market segment (Davis, 2002). How familiar the intended market and product are to the company do often have an impact on the probability of success. For instance, radical innovations that target unfamiliar markets proposes higher probability of failure as the company is not fully aware of the inherited risks in competition, volatility in prices, required time to market, regulation and legislation that might put restrictions on the new product, or other factors that could have an impact on how successful the product will be in the market. Contrary, if the products are considered to be familiar, and aimed at the current markets of the company, this often indicate higher probability of success as the company is prepared for the current premises of the target market (Day, 2007).

Existing gaps in the value chain, such as lacking resources, or low presence in the target market, could be an indicator of an existing need for the company to develop strategies for how to increase the probability of successfully commercializing a new product. The company could possibly need external partners to get expertise and insights that do not exist internally, to create a better understanding of the value chain or the market segment risks (Davis, 2002). What market risk that is specifically necessary to assess, and how to practically approach it, is concluded in Table 3.2.

#### 3.4.4.2 Evaluating Technical Risk

Technical risk composes the risk of the new product itself, but also the risk that exists in the development capabilities of the company. In order to evaluate the probability of success for a new product, the risk must be evaluated from the perspective of the specific technology, as

well as to which degree the technology is incorporated in the company's existing processes and operations of product development and manufacturing. Furthermore, it is necessary for the company to evaluate the current development team and the supporting program management in order to understand the existing internal capabilities. The company can by this assess if there exist a need of acquiring any external knowledge that, by providing technical skills and experiences, can mitigate possible risks. However, in case of using external partners it is important that these are aligned with the NPD process, in order to keep the development efficient (Davis, 2002). What technical risk to specifically assess, and how to practically approach it, is concluded in Table 3.2.

### 3.4.4.3 Evaluating User Risk

User risk determines the chances of that the company develops the right product for its target customers. The company needs to assess its level of knowledge regarding the specific attributes of the user interaction with the product, as well as the degree of knowledge regarding the requested design and performance qualifications (Davis, 2002). In order to successfully launch a new product that the customers are prepared to pay for, the product have to match the demand and the need of the customers or solve a specific problem better than existing products in the market. As an on-going process, the company need to assure that they understand their potential customers, in order to deliver products that stay in line with their existing needs and desires. It is for instance critical that the company understands the social and environmental acceptability in the target market to assure that the preferences of the customers are respected (Day, 2007). If the company finds gaps in the interaction and specification assessment, there is a risk that the product requirements are not fully understood and therefore the probability of commercial success of the new product decreases. In that case, the company needs to mitigate the risk by developing strategies for how to manage the absence of user pre-research, before approval of the specific product (Davis, 2002). What user risk to specifically assess, and how to practically approach it, is concluded in Table 3.2.

**Table 3.2** Types of Risks

Type of Risk	Criteria	Practical Assessment
<b>Market Risk</b> (Davis, 2002; Day, 2007)	Value Chain & Market Assessment	- Sales force - Distribution channels - Manufacturing capabilities - Customer support - Presence in the market
<b>Technical Risk</b> (Davis, 2007)	Innovation & Capability Assessment	- Technology and current use of it - Capabilities of development team - Capabilities of supporting program management
<b>User Risk</b> (Davis, 2002; Day, 2007)	Interaction & Specification Assessment	- Design and performance specification are known - Attributes of user interaction with the product are known

### **3.5 Value**

As well as risk compose a critical component in the assessment of development projects in portfolio management, so does its counterpart value. Assessing risk includes probabilities of potential obstacles and threats, simultaneously as assessing value potential concerns detecting opportunities for the company, which is equally important from a portfolio management approach. Value can be defined differently depending on what perspective you consider it from. Usually value is discussed in broad and general terms, which makes it rather intangible but nevertheless of great importance (Bowman & Ambrosini, 2000). Starting off on a general level we define value, what is needed to create it, and how it can be created, to connect it to its importance in portfolio management.

In order to make companies perform well, they need to exploit their internal resources and capabilities to implement strategies that address existing market opportunities (Penrose, 1959; Andrews, 1971). To enable this, it is important that managers of companies are aware of the existing key resources and its connected performance and value drivers within the company. Performance drivers concern a causal relationship between the resources of the company and value creation, where the resources do not constitute value by themselves but by the services they deliver (Penrose, 1959). To facilitate the understanding of the existing resources and how these resources are translated into value for a company the causal relationships between the resources can be visualized in a strategy map. A strategy map is based on the perspectives of the balanced scorecard and displays how a company can transform its resources into tangible outcomes (Kaplan & Norton, 2000)

#### **3.5.1 Value Creating Assets**

To understand and facilitate the concept of value, different types of assets are needed in a company. According to Marr, Schiuma and Neely (2004) financial assets, physical assets, relationship assets, human assets, cultural assets, practices and routines as assets, and intellectual property assets are considered to be the most significant ones in the value creating process. Following is a more thorough description of these different types of assets.

The financial assets equal financial capital, which traditionally has been an important resource to possess in order to make investments in necessary resources for the company. It is also stated that money is an important input as well as output for the company, in terms of cash flow (Itami, 1987). Physical assets of a company is often represented by tangible assets, such as plant, equipment, land and resources (Penrose, 1959), but is also emphasised as a source of competitive advantage (Williamson, 1975).

The relationship assets constitute the relationship between the company and its external parties as well as the knowledge and information exchange between them. This information exchange include brand image, company reputation and image, and influence over distribution channels and its suppliers (Itami, 1987). These relationships can be formal or informal with customers, suppliers, network partners or investors (Roos & Roos, 1997). The human assets are by many researchers referred to as a key asset of the company, including the

employees' know-how, technical expertise, problem-solving capability, creativity, education, and attitude (Penrose, 1959; Becker, 1964; Schultz, 1981).

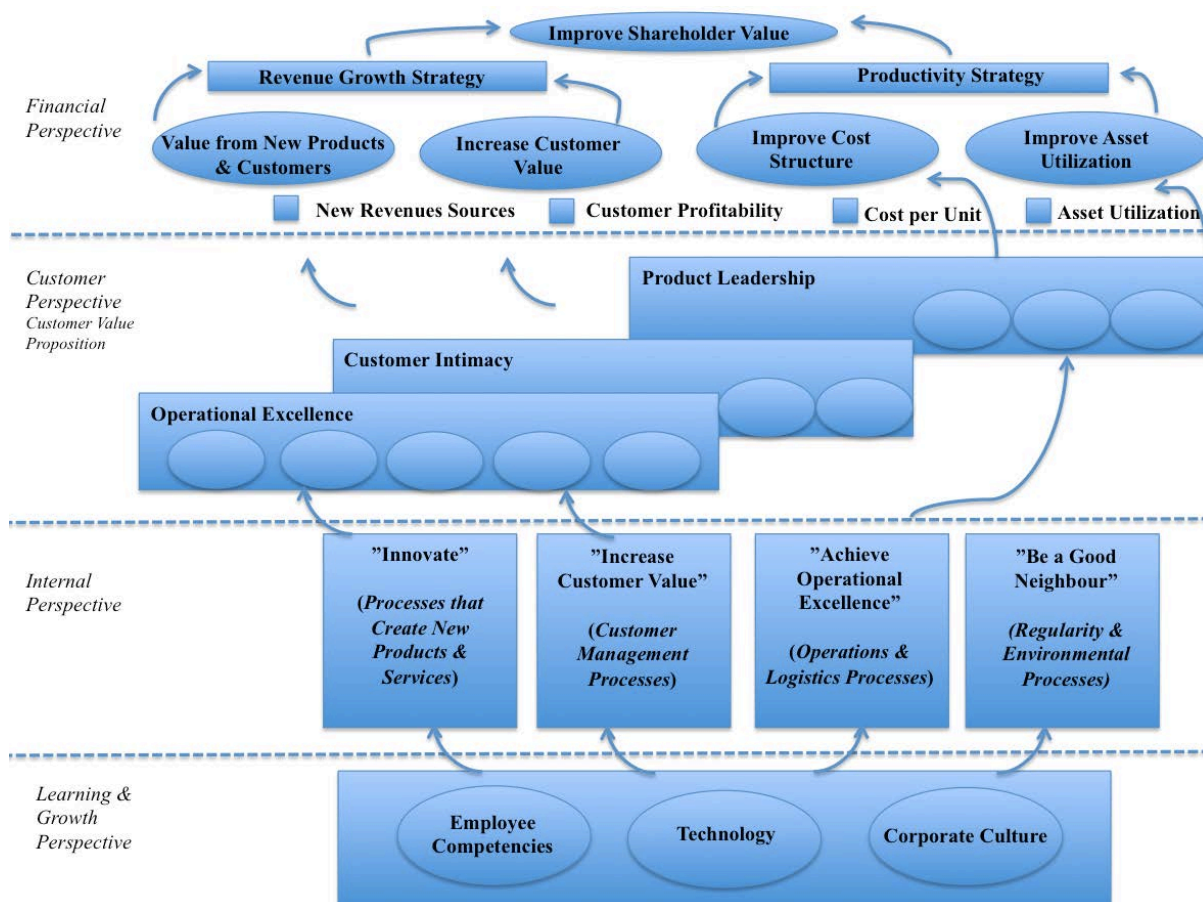
The cultural assets addresses the specific culture that is present in a company, that gives each individual within the organization a common way to see things, to make decisions and to establish a value system (Itami, 1987). Culture assets provide the employees with a shared framework to interpret events and that encourage employees to work as both an autonomous entity and as a close-knit team, in order to achieve the company's objectives (Marr, Schiuma & Neely, 2004). Practices and routines as assets can be created from shared knowledge within an organization (Nelson & Winter, 1982). Practices and routines can be both formal and informal and can for example determine how processes and workflows are being handled in the company. Itami (1987) considers a company's capability to manage information flows as a valuable invisible asset.

Intellectual property can be defined as "the sum of assets such as patents, copyrights, trademarks, brands, registered design, trade secrets and processes whose ownership is granted to the company by law" (Marr, Schiuma & Neely, 2004, p. 316). These property rights represent the tools that enable the company to gain a protected competitive advantage. There are a number of studies from several industries, which show the importance and power of intellectual property rights (Grindley & Teece, 1997; Edvinsson, 1997).

### **3.5.2 Value Creation**

Following the concepts of the resource based view companies can be considered as a bundle of resources in which the resources depend on each other to create value. The resources are of different types and characteristics, and there are interrelative relationships between them (Bowman & Ambrosini, 2000). Value can be defined and categorized in different ways and here we have sorted it into the four perspectives of financial value, customer value, internal value and learning and growth value.

Figure 3.3 presents the different perspectives. In the perspective of learning and growth value, the assets of employee competences, technology and corporate culture matter significantly. This perspective is closely linked to the internal value perspective where the company focus on innovativeness, to increase customer value, to achieve operational excellence, and to take regulations and environmental aspects into consideration. These aspects are connected to the customer value where the company focuses on operational excellence, customer intimacy and product leadership. All this is tied up into the financial value where the company considers new revenue sources, customer profitability, cost per unit and asset utilization. These considerations results in a revenue growth strategy and a productivity strategy, that ultimately aims to increase shareholder value. In order to ensure efficient management of the company's resources to create the desired value, it is vital to understand the interrelationships and the interdependencies between them (Kaplan & Norton, 2000; Marr, Schiuma & Neely, 2004).



**Figure 3.3** Value Creating Perspectives (Kaplan & Norton 2000; Marr, Schiuma & Neely, 2004)

### 3.5.3 Measuring and Estimating Value

Due to the fact that it exists several types of value, there are also different ways of measuring and assessing them. Considering the creation of value from a short-term perspective it often relates to the financial aspects of it, and this is in general the most accessible type of value to measure. Frequently used evaluation methods to address the value potential of new projects from a financial perspective are NPV and Internal rate of return (IRR). The NPV method shows the present value of an investment or a project as the difference between the present value of its benefits and the present value of its costs. If the NPV is positive, it is beneficial to pursue with the project, and if it is negative the project should be terminated because it is not considered to bring enough revenue to the company. If the NPV method is used as a decision tool for prioritizing between projects, the projects with the highest NPV should be chosen. The use of IRR is fairly similar to the method of NPV and can be applied on similar situations since the IRR is the discount rate that gives a NPV of zero. The IRR investment rule states that a company should undertake an investment opportunity if the IRR of the investment is higher than the cost of capital of the company, and if it is greater than comparable options. While applied correctly, the IRR and the NPV will yield the same result and gives an indication of the financial value of projects (Berk & DeMarzo, 2014).

These financial models are based on assumptions that for example concern scale, time and effort needed in the project. Foremost, the models also build on a simplified reality, meaning that the methods do not take all necessary aspects into consideration (Griffin et al., 2011). Regarding development projects, this also requires the company to use forecasts and benchmarks for estimating a future scenario of the project. By making many assumptions, more risk and uncertainty gets included in the calculations and can create a biased view of a future scenario, that either can be in favour or not in favour for the project (Berk & DeMarzo, 2014).

On an overall level, to only use financial methods can as mentioned incentivise towards a short-term evaluation perspective since these methods are biased against delayed returns and thereby risky, long-term projects. This means that the beneficial balance that can be achieved by using a portfolio approach in NPD could possibly be deleted if solely relying on these financial evaluation methods (Day, 2007). In order to address the benefit of long-term value creation and innovativeness of companies and their projects, value can also be considered and complemented in more relative terms. By making portfolio management decisions based on opinion power, value can be created by the expertise knowledge and insights of specific managers working with the portfolio management and its related processes. However, assessing value from a long-term perspective can sometimes be a subjective and arbitrary process that is difficult to measure, but while successfully managed, it can contribute to enhancing the performance of the company (Griffin et al., 2011).

### **3.5.4 Criteria for Decision-Making regarding Value**

Following the previously applied categorization of value, some factors can be identified as central for enhancing the decision-making process to better address value in portfolio management.

#### **3.5.4.1 Financial Value**

In order to make useful decisions with regard to the financial aspects of value in portfolio management, there are various criteria necessary to take into consideration. Most importantly, there must be a process that addresses the impending profitability potential of the projects. It is possible to calculate potential profitability, for example through calculating return on assets (ROA), return on investments (ROI), or a profit margin (Hagel III, Brown & Davison, 2010), but important to consider is that measuring a development project in absolute numbers can incorporate a great deal of uncertainty, depending on the time horizon and the underlying assumptions. If it is not possible or desirable to apply a mathematical method, a relative estimate might be in place. For addressing the financial value potential of a development project Day (2007) suggests that a screening can be useful. Central for addressing the financial potential is to start by asking the question “is it worth doing?” and more specifically break it down to if the product would be profitable at an acceptable risk. As a final step for detecting the financial potential, Day (2007) highlights that if the forecasted returns are greater than the costs, and if the risks are at an acceptable level, this indicates in a relative way the financial potential of the project. What financial value to specifically assess, and how to practically approach it, is concluded in Table 3.3.

#### **3.5.4.2 Customer Value**

Considering the value potential from a customer perspective where the company focuses on operational excellence, customer intimacy and product leadership, a criterion for making connected decisions is to address the market potential. This includes investigating if a market for the new product truly exists, otherwise it will be difficult to make a successful launch and expect to gain profits from it. Day (2007) suggests that a beneficial way to detect the market potential is to ask certain questions related to the market potential. If there is a need or desire for the product, if the customers are willing to buy it, if the size of the potential market is significant and large enough to be profitable, and finally, if the customers will buy the product, are important questions to consider.

Customer value also incorporates other aspects than the market that the customers together constitute. The fundamental characteristics of the customers themselves are important to make decisions around, in order to develop products that they want to buy. Necessary criteria to address in the decision-making process for specifically create value for the customers are if there exists customer loyalty and possible motives behind it, brand awareness and if that results in brand loyalty, and ultimately assess the customer satisfaction (Solomon, 2015). What customer value to specifically assess, and how to practically approach it, is concluded in Table 3.3.

#### **3.5.4.3 Internal Value**

The internal value can be defined broadly as all the internal activities that generates value in the company, for example to create innovativeness, to increase customer value, to achieve operational excellence, and to take regulations and environmental aspects into consideration. Presumably, this demands tangible assets such as production facilities with necessary equipment to pursue these activities. We have mainly focused the internal value on the products themselves and the related decisions that need to be done.

Day (2007) propose that for relatively estimating the potential of a product, questions regarding if the product is real and if the product can be competitive are necessary to ask. For assessing if the product is real, the company needs to ask if the product concept is clear, both internally and externally, if the product is possible to make and if the final product will satisfy the market. Regarding the competitiveness of the product, the company need to address the strategic aspect of developing the product and the effect of it. By asking questions regarding if the product will lead to a competitive advantage, if an eventual advantage can be sustained and protected, and how possible reactions from competitors can look like, the competitive position of the product can be assessed. What internal value to specifically assess, and how to practically approach it, is concluded in Table 3.3.

#### **3.5.4.4 Learning and Growth Value**

For creating value of learning and growth, a more general strategic approach is applied. Here the competences of the company's employees, the culture of the company and the management are of importance. For relatively addressing the learning and growth value of development projects, Day (2007) proposes to screen for if the product make strategic sense



to launch and if the company itself can be competitive during and after the project is done. The strategic importance of a product can be investigated by asking if the product matches with the overall growth strategy of the company, and if the top management will support it in a necessary way. Regarding if the company can be competitive, questions about if the company possess superior resources, appropriate management, and if there is a solid understanding of, and ability to respond to, the market is necessary to consider.

Since decisions regarding the processes that can create learning and growth value can be considered as the most arbitrary, based on the subjective opinions of the involved managers (Griffin et al., 2011), it can be helpful to apply certain models that easier address the possible value generation. Referring back to the third category defined by Oh, Yang and Lee (2012), bubble diagrams, portfolio maps, and strategic buckets are suitable methods for addressing this type of value and can ease the decision-making process. These models can evidently also enhance the relationships between the NPD projects and the strategy of the company. What learning and growth value to specifically assess, and how to practically approach it, is concluded in Table 3.3.

**Table 3.3** Types of Value

Type of Value	Criteria	Practical Assessment
<b>Financial Value</b> (Day, 2007)	Profitability at a Specified Risk Level	<ul style="list-style-type: none"> <li>- Calculate ROA, ROI, profit margin</li> <li>- Relative estimate of profitability on an acceptable level of risk</li> <li>- Forecasted returns</li> <li>- Risk level</li> </ul>
<b>Customer Value</b> (Day, 2007; Solomon, 2015)	Market Potential	<ul style="list-style-type: none"> <li>- Need/ desire for the product</li> <li>- Willingness to buy</li> <li>- Size of the market</li> <li>- Customer satisfaction</li> <li>- Customer loyalty</li> <li>- Brand awareness</li> </ul>
<b>Internal Value</b> (Day, 2007)	Product Potential	<ul style="list-style-type: none"> <li>- Clear product concept for external and internal purposes</li> <li>- Possible to manufacture</li> <li>- Satisfaction of the market</li> </ul>
<b>Internal Value</b> (Day, 2007)	Product Competitiveness	<ul style="list-style-type: none"> <li>- (Sustained) Competitive advantage</li> <li>- Competitors reactions</li> </ul>
<b>Learning &amp; Growth Value</b> (Day, 2007)	Strategic Sense to Launch	<ul style="list-style-type: none"> <li>- Match with overall growth strategy</li> <li>- Support by the top management</li> </ul>
<b>Learning &amp; Growth Value</b> (Day, 2007; Oh, Yang & Lee, 2012)	Company Competitiveness	<ul style="list-style-type: none"> <li>- Superior resources</li> <li>- Appropriate management</li> <li>- Ability to respond to the market</li> <li>- Models: bubble diagrams, portfolio maps, strategic buckets</li> </ul>

### 3.6 Concluding Remarks

Following, a summary of the highlighted research within the field of decision-making on risk and value parameters in portfolio management is presented (Table 3.4). Throughout the chapter we have defined risk as consistent of market risk, technical risk, and user risk. Furthermore, value is defined as consistent of financial value, customer value, internal value, and learning and growth value.

**Table 3.4** Types of Risk and Value

Type of Risk/ Value	Criteria	Practical Assessment
<b>Market Risk</b> (Davis, 2002; Day, 2007)	Value Chain & Market Assessment	<ul style="list-style-type: none"> <li>- Sales force</li> <li>- Distribution channels</li> <li>- Manufacturing capabilities</li> <li>- Customer support</li> <li>- Presence in the market</li> </ul>
<b>Technical Risk</b> (Davis, 2007)	Innovation & Capability Assessment	<ul style="list-style-type: none"> <li>- Technology and current use of it</li> <li>- Capabilities of development team</li> <li>- Capabilities of supporting program management</li> </ul>
<b>User Risk</b> (Davis, 2002; Day, 2007)	Interaction & Specification Assessment	<ul style="list-style-type: none"> <li>- Design and performance specification are known</li> <li>- Attributes of user interaction with the product are known</li> </ul>
<b>Financial Value</b> (Day, 2007)	Profitability at a Specified Risk Level	<ul style="list-style-type: none"> <li>- Calculate ROA, ROI, profit margin</li> <li>- Relative estimate of profitability on an acceptable level of risk</li> <li>- Forecasted returns</li> <li>- Risk level</li> </ul>
<b>Customer Value</b> (Day, 2007; Solomon, 2015)	Market Potential	<ul style="list-style-type: none"> <li>- Need/ desire for the product</li> <li>- Willingness to buy</li> <li>- Size of the market</li> <li>- Customer satisfaction</li> <li>- Customer loyalty</li> <li>- Brand awareness</li> </ul>
<b>Internal Value</b> (Day, 2007)	Product Potential	<ul style="list-style-type: none"> <li>- Clear product concept for external and internal purposes</li> <li>- Possible to manufacture</li> <li>- Satisfaction of the market</li> </ul>
<b>Internal Value</b> (Day, 2007)	Product Competitiveness	<ul style="list-style-type: none"> <li>- (Sustained) Competitive advantage</li> <li>- Competitors reactions</li> </ul>
<b>Learning &amp; Growth Value</b> (Day, 2007)	Strategic Sense to Launch	<ul style="list-style-type: none"> <li>- Match with overall growth strategy</li> <li>- Support by the top management</li> </ul>
<b>Learning &amp; Growth Value</b> (Day, 2007; Oh, Yang & Lee, 2012)	Company Competitiveness	<ul style="list-style-type: none"> <li>- Superior resources</li> <li>- Appropriate management</li> <li>- Ability to respond to the market</li> <li>- Models: bubble diagrams, portfolio maps, strategic buckets</li> </ul>

In order to make the right portfolio decisions, companies need to assess potential risk and value of new products both from an external as well as an internal perspective. Concluding from this literature review, it is detectable that risk and value often concerns similar issues, but needs to be considered from different angles. Applying portfolio management gives a more holistic view of the development projects and can be done through reviewing and applying the criteria presented in Table 3.4. This can result in an enhanced decision-making of the projects.

## 4. Empirical Findings

*This chapter presents the findings of the interviews conducted with employees at Polarbröd. The first part of the chapter provides insights of the Swedish bread industry and the remaining part of the chapter is divided into the three time perspectives of past, current, and future. These perspectives cover the development of decision-making in portfolio management at Polarbröd, with regard to the practical risk and value assessment of NPD. As developing products is one way of competing and strategizing towards competitors, specific information regarding visualizing the portfolio management models that Polarbröd currently apply, as well as the specific names of their products, will not be stated in this study.*

### 4.1 Characteristics of the Bread Industry

According to the respondents at Polarbröd, the industry imposes many challenges to address in order to remain competitive in the marketplace. A shared belief among the respondents is that a significant challenge does not solely lie in the consumers<sup>1</sup> themselves, but in the intense and sensitive power of the customers<sup>2</sup> ICA, Coop and Axfood. The respondents explain that in comparison to the historical product development of new products, the industry is today more customer-driven. To make sure that the products are accepted and placed on the store shelves, the companies need to manage tougher negotiations, by which the retail and grocery chains have to be convinced of the value and competitiveness of a new product. One of the respondents at Polarbröd describes the power position of the retail and grocery chains in the following way:

The retail and grocery chains have a position of power that is a bit nasty. There are incredibly tough negotiations. One can spend a lot of time on analysing, planning, implementing, and innovating, but the retail and grocery chains have such power that they could crush your dreams without giving you an opportunity to present your idea to the consumers.

According to the respondents, the ideal situation would be to cooperate with the retail and grocery chains in the development of new products, in order to develop products that they will accept and present on the shelves. However, there is a strong belief that the negotiation situations could be misused by the retail and grocery chains, who easily could make the ideas their own and produce similar products under their own brand.

In the Swedish consumer market there are three launching opportunities every year, referred to as 'launching windows', where all companies within the industry have the opportunity to present their new products to the retail and grocery chains, who in turn ultimately decide if these should be accepted or not. As the retail and grocery chains do not fill their shelves with only new products, the companies must in a clear manner convince the retail and grocery chains in the negotiations that their products are right for the market. Specifically for Polarbröd, the new products are presented by several representatives much depending on the innovation level of the products. There are always at least two representatives involved, in

---

<sup>1</sup> Consumers correspond to the individuals that buy and consume the products

<sup>2</sup> Customers correspond to the group of retail and grocery chains

order to negotiate in the best possible way and hopefully succeed in delivering news to the shelves at all three launching windows.

Furthermore, the respondents at Polarbröd highlighted the importance of staying visible in the stores, which could be done by claiming as much shelf space for front standing products as possible, internally referred to as 'face'. The respondents explained that few consumers spend much time in front of the shelves in the stores when choosing their bread. Often they have a few familiar products to choose between, or they make an impulsive purchase and grab the most appealing bread. This makes visibility a critical aspect to consider, ensuring that the consumers pay attention to the products. Presenting new products to the retail and grocery chains is a strategic way for Polarbröd to receive more face in the shelves and thereby increase their visibility towards the consumers. In addition, new products will often lead to the opportunity of advertising and offering special launching offerings that create even more visibility. As many consumers are sensitive for campaigns and tempting offerings, this creates further possibilities to increase sales, according to the respondents.

A majority of the respondents at Polarbröd also discussed the importance of staying in line with the general trends and the demand in the market regarding what food is considered to be popular, how and where the consumers eat, and at what occasions etcetera. The respondents also argued that there are large differences between the different markets. The markets that Polarbröd are present in today are divided into four geographical areas; the domestic retail and grocery market, the Nordic market (Norway, Finland, Island, and IKEA), the non-retail market (Swedish catering market and the industry that include sandwich-producers), and the European market (France, UK, Germany and the Baltic region). The respondents explained that there are large differences between for instance Sweden and Norway; two geographically close but otherwise very different markets. Today there is a strong trend for organic products within the Swedish market, while the Norwegian market is more focused on the level of sugar and salt in the products.

The respondents also emphasized the importance of understanding these trends and what they actually mean. Several respondents discussed the importance of comprehending the differences in trends, from the perspectives of what consumers say that they want to have, and what they actually are buying and to what price, which is difficult to measure. There was also a strong agreement on the importance of timing when it comes to launching a new product to the market, synchronized with the current trends.

According to one respondent, the percentage of new products within the bread industry has never been lower than it is today. During the past seven years, this ratio has been under three percent, which according to the respondent symbolizes how difficult it is to successfully develop and launch new products. Factors that could explain this are mainly the competition between the large producers within the industry (Polarbröd, Fazer and Pågen) but also the competition between the retail and grocery chains. Today, private brand labels, merging labels, and the supply of freshly baked products in the stores have grown significantly, compared to the situation a couple of years ago and this has increased the competition

between the actors in the market. This creates a challenging situation for targeting both customers and consumers.

## **4.2 Past Structure of the Product Development**

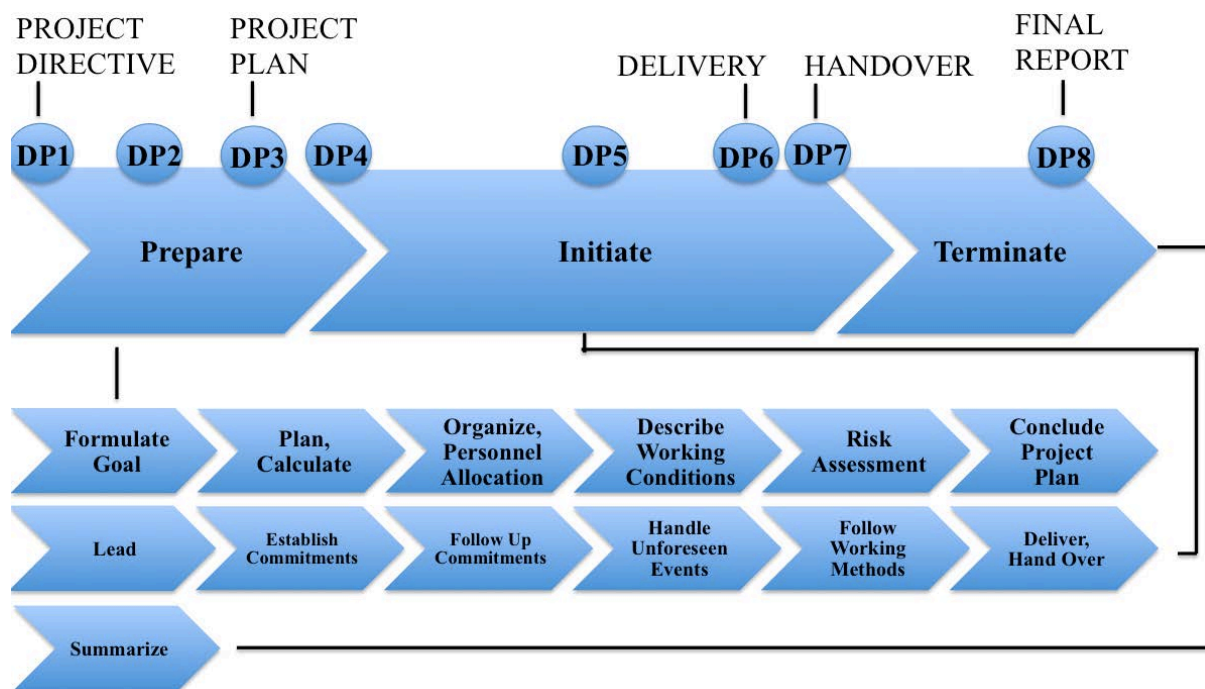
### **4.2.1 Structural Characteristics**

Several of the respondents describe Polarbröd as an innovative family business that has a history of successfully developing and delivering new products. However, the respondents mean that the former process of developing new products at Polarbröd was rather unstructured and informal. Some explained it as the “wild west”, where for instance an account manager could come up with a new product idea after talking to a customer somewhere in the world, the manager discussed the idea with one of the bakeries to assure that some samples were made, and thereafter a new product was ready for launch that hopefully would generate volumes. Some respondents claimed that it existed some structure while developing new products, but it was not obvious. This implied much freedom and flexibility in making decisions regarding the development of new products, which was positive on some aspects, but particularly negative according to one respondent. When Polarbröd started to grow and expand, it became more difficult to successfully present new products due to the internal challenges of the unstructured NPD process. One aspect of concern was the unclear responsibilities, which particularly meant that anyone could do anything if he or she was persuasive enough. One effort to create a better structure and distinguish responsibilities was to implement planning meetings, internally referred to as ‘bread meetings’, where all significant decisions were made. From this restructuring, which took place in 2009 it became the overall responsibility of the bakeries and the marketing team to lead the development of new products.

#### **4.2.1.1 The PPS-Model**

In 2009, Polarbröd started to follow a model called practical project steering (PPS) for making decisions regarding their development projects (Figure 4.1). The PPS-model was a model for managing projects, and served as a type of Stage-Gate model, where it was decided through several gates if a specific project, based on different assumptions and criteria, would proceed or not in the process towards launch. The decisions regarding if a project should proceed or become rejected was made by the management team and supported by the analyses made by the project team during the bread meetings. The first stage of the PPS-model was to make a project directive, where an idea was presented and arguments regarding the potential of the project were addressed. The directive was further discussed in the bread meetings, where a decision of proceeding or termination was made. The next stage involved a pre-study, where a more thorough analysis was made in combination with test-baking, which usually was performed in the bakery in Omne where that capacity was, and still is, present. After a new decision of proceeding or termination of the product, a continuous work towards launch started. This requested a project plan including a time plan targeting a specific launching window, budget, and analysis of the market etcetera. Further sensory tests of the product were made, both internally and externally. The next step involved making it possible

to advance the product along the entire line, from producing the product in the bakeries, to effectively packing the product. For certain products, sample sales were made before making the final decisions regarding launch, price, and presentation to the retail and grocery chains.



**Figure 4.1** The PPS-model (TietoEnator, 2008)

#### 4.2.1.2 Organisational Structure and Distribution Arrangements

The past structure for developing products was explained as being rather separated, where the different departments and people of different expertise operated independently. Above all, the three bakeries in Omne, Älvsbyn and Bredbyn operated as independent units, simultaneously as they had central roles in the development and production of new products. At this time, the Älvsbyn bakery had a large capacity and was focused around producing the most popular products in large volumes. The Omne bakery was mainly producing dark bread but suffered tremendously when the demand for those products weakened. Therefore, a sourdough facility was installed at the time. The bakery in Bredbyn was specialized in producing short series of bread, with a large variety. A general agreement among the respondents was that the culture of operating independently had several consequences. For instance, the respondents meant that this led to inadequate cooperation and unwillingness to share information and resources, which created poor transparency and overview of the NPD between the different departments.

One important aspect regarding the product development discussed by several of the respondents, was the structure and collaboration between Polarbröd and Polfärskt Bröd. Polfärskt Bröd is responsible for the distribution of Polarbröd's products for the Swedish consumer market and have the final contact with the retail and grocery chains regarding the physical arrangement of the products in the shelves. Polarbröd is the major shareholder of Polfärskt Bröd, owning 51 percent. The other part of Polfärskt Bröd is owned by 23

individual companies around Sweden that jointly run the business. This cooperation is considered to be one of a kind, and ends up in a beneficial situation with the ambitious entrepreneurs who are guaranteeing that Polarbröd's products are represented in the shelves in the stores. Polfärskt Bröd possess an important role in the process of developing new products at Polarbröd, since they constitute the final part of the value chain, closest to the customers and consumers, and thereby they possess much market expertise. Respondents clearly stated that it was of major importance for Polarbröd to work close to Polfärskt Bröd, as it was, and still is, unbeneficial to have them against themselves in their operations. Efforts were made to create an integrated management committee, but this collaboration was not successfully managed and was therefore put on hold at the time.

#### **4.2.1.3 Consumer Categorization**

In 2011, Polarbröd put a lot of effort into developing an up-to-date category strategy for their products in the Swedish consumer market. Instead of categorizing according to the specific type of bread, Polarbröd categorized the products into six groups, reflecting the need of the consumers. The first group became *family favourites*, which included products suitable for the entire family, packed to last for a whole week, without any protruding flavours. The second group was *toast and bake*, which included bread to toast and heat, usually connected to sensory pleasure. The third group became *origin and tradition*, corresponding to locally produced bread or bread suitable for holidays or traditional celebrations. The fourth group was defined as *excitement and variety*, which contained products of new and exciting character, for a consumer that seeks variation and who likes to deviate from current trends. The fifth group was called *health plus*, corresponding to bread of more healthy character, such as gluten free bread, bread with low sugar and salt levels, or bread with fewer carbs. The sixth and final group became *bread to combine with food*, which contained bread that got a central role of a dish, and that had the possibility to be filled with different ingredients. One respondent explained category management as a useful tool in understanding the target groups and finding their need and desire for different products. From this reasoning, it was easier to understand which products that needed to be developed. Category management also created enough understanding of the consumers to be able to place the products more beneficially in the shelves of the stores, to be able to maximize sales.

#### **4.2.1.4 Specific Project Examples**

To further illustrate how the product development proceeded within Polarbröd during the years 2012-2015, the respondents discussed specific products with a typical focus on how decisions were made and how risk and value parameters were assessed. The following paragraphs present these products more in detail.

*Product A* was one of the first products that were made out of sourdough, which required significant facility investments. The product was a strategic categorization effort for the Swedish consumer market, where Polarbröd saw the opportunity of developing a darker and healthier portion bread to include in the category of excitement and variety. This was done in



the Omne bakery, in effort to stabilize its financial situation due to the significant loss in sales from other products.

*Product B* was developed for the category family favourites, and was the successor to the product Morgongoda. The product was a light bread of wheat, which later on got a spin off as hamburger bread and an addition of sourdough. This product was also developed in effort to turn the falling existence of the Omne bakery, which had been adversely affected of the downturn in demand for dark bread.

*Product C* and *Product D* were two rather simple projects, also included in the category of family favourites. The two products were developed out of already existing dough, but with new innovative formats. Both were aimed to target consumers more aware of health and were developed quickly in order to have some products to present for the upcoming launching window at the time.

*Product E* was also a simple project. The product is a portion bread of rye and was developed out of already existing dough, but with a new format. By using a new cutter, the bread got an innovative perforation that attracted the eye of the consumers. The product was included in the category of family favourites.

*Product F* and *Product G* are both flatbreads. Product F was made out of sourdough and was an effort to modernize and renewing the assortment of flatbread for the consumer category of origin and tradition. Product G was on the other hand a strategically important project for Polarbröd. The product was an organic flatbread, aimed to illustrate the core value of sustainability that Polarbröd strongly advocates. Product G was also included in the category of origin and tradition.

#### **4.2.2 Decision-Making in the Projects**

In the previous process of developing new products at Polarbröd, decisions were made with support of the PPS-model. The structure of the PPS-model provided an overview of what resources each individual project needed and in which phase of the process each individual project was present. The decisions were made at the bread meetings, where the management team discussed the situation of the projects with the different project teams, concluding in a decision of allocating the requested resources or not, or letting the project proceed to the next step of the process or not. In most cases the management team accepted the requests of the project teams, resulting in many active projects that were difficult to get an aggregated overview of. This decision-making system resulted in a focus on independent and short-term projects, since the prioritization of the management team often lied in delivering new products for the next launching window. This was as mentioned the case of the products Product C and Product D.

Several of the respondents referred to the decision-making process as difficult to incorporate and to understand the aggregated situation of the projects, which resulted in that isolated decisions often were made. Usually, these decisions were not aligned with the company goals

and strategies. The fact that the different bakeries operated as independent units made the motives for, and abilities to, make decisions shifting in quality. The decisions were not always made in the interest of Polarbröd as a company, but rather in favour for the specific bakery. This also made it possible for the most assertive employees to get their ideas through, because they often got the resources they requested. This did not include a mind-set focused around the consequences for other projects or departments within Polarbröd. The development process for Product A constituted an illustrative example. While the bakery in Omne was suffering from loss in sales especially due to the changing preferences for dark bread, the management team rushed through the PPS-process by making short cuts in the decision-making process in order for the project to proceed, even though its character might have requested a more thorough consideration and analysis. Also, the management team was convinced by the concept of Product A, loosely founded on their own preferences for it and the hopeful thought that it might increase sales of the Omne bakery.

As the decision-making process was less structured and no specific evaluation model was applied to coordinate the decisions within Polarbröd, some respondents did find it hard to explain how the discussions proceeded regarding some of the past development projects. This was due to lack of overviewing documentation of how the discussions proceeded.

#### **4.2.3 Risk Assessment of the Projects**

For assessing the risk of the development projects conducted at Polarbröd, the respondents explained that it was mainly done through the pre-study of the PPS-model. This pre-study involved three parts. The first part was about the market, where opportunities for successfully launching a product were evaluated. The respondents clearly stated that this part included a wide range of components and much to assess in order to find the aggregated market risk. Components of market risk could be what market trends looked like, the layout of the stores, and what the competition looked like. According to the respondents, the question that frequently was asked was if the product could be sufficiently unique to fill a gap in the demand and penetrate the market. The second part was about the bakery. This included what investments were needed to be able to produce the product, and what was the inherent risk of it. The third part in the pre-study involved recipe and dough, which was integrated in the final cost of the product. The information that was identified in the pre-study was evaluated from a risk perspective and used as a foundation for the decisions that were made through discussions on the bread meetings.

One of the respondents explained that one impending risk that was, and still is, present in all development projects, is the risk of not managing to negotiate and convince the retail and grocery chains regarding a specific product. It is about delivering a product that is new and exciting enough, to the right price. The respondent argued that the level of risk varies depending on the amount of investments that was made in the development project, since there is a significant risk of losing much more if the launch becomes unsuccessful. It could for instance result in large sunk costs. Product A, one of Polarbröd's first products with sourdough, states an example of a high-risk project. To develop the product, heavy investments in a special facility for sourdough were required, which from a financial

perspective implied a significant risk. Developing Product A was also a high-risk project from a technical perspective, due to the novelty of producing products with sourdough within the company. Actions that were made to mitigate those severe risks was to perform different product tests early in the process, for example consumer tests where everything from package to taste was evaluated. Several respondents explained that a contrasting project to the development to Product A was the project of Product E. Product E was a product of a more simple character, where the product was made with an already existing recipe for dough but had an alternative format made by a different cutter to attract the consumers. This product was considered to be a low-risk project from both a financial perspective and production perspective, since no significant investments or changes were made.

Another product that by the respondents was perceived as a high-risk project from both a market perspective and a production perspective was the organic flatbread Product G. Polarbröd had at a previous occasion launched a similar product of organic character, but experienced bad timing towards the market trend of organic products and failed to sell the product at the expected volumes. However, when making decisions regarding Product G the request for an organic flatbread, especially within the public sector, was evident and the potential market was significant. The public sector market usually works as a good indicator of upcoming consumer trends, as the mechanisms often is faster there compared to in the retail and grocery chains. Polarbröd made the assessment that the risk of launching an organic flatbread to the retail and grocery chains was manageable, since they now requested organic products. Even though the previous experience of a failed product for the segment, Polarbröd believed that Product G was developed with better timing towards the trends. Product G did also impose challenges from a production perspective. Polarbröd assessed the risk of producing an organic product as large, due to the special handling, characteristics, and price of the ingredients. The special handling of ingredients made it necessary to invest in some equipment for the facility, to be able to follow the national restrictions for handling organic products.

An aspect of concern for several of the respondents was cannibalization, which still is an accurate concern at Polarbröd. Since Polarbröd works much with 'product families', products with similar but not identical characteristics, it is a significant risk that a product from a specific product family steals revenues from a similar one. Utilizing the product families fully is something that Polarbröd tries to do, since customers and consumers often perceive products as completely new even though they are similar to existing ones. However, it is done with the risk of making another product perform worse and was an imminent situation for the products Product C and Product D.

#### **4.2.4 Value Assessment of the Projects**

As similar to risk in the NPD projects, the respondents concluded that value was assessed from different perspectives. Also the value potential of a project was partially assessed through the pre-study of the PPS-model. While considered from an external market perspective, value of a development project was usually considered in terms of potential profitability, margin, or price per kilo and price per product. From an internal perspective,

value was considered as how good the processes in the bakeries worked, the ability to bake the product, how many kilos of bread it would have been possible to produce on each line per hour, and how effective the product was packed etcetera. Although, the respondents highlighted the market perspective and sales potential as the most critical components of value, since that was the deal breaker for keeping a product or not, and the ultimate goal was often to create a best seller.

The financial value of projects has been, and still is, evaluated according to three financial parameters. The first one implies profitability, where an estimation of the project's profitability, in percent, is presented in relation to similar products. This could be considered as corresponding to return on revenue. The second parameter is the margin of the project, calculated on the selling price to Polfärskt Bröd (or other agent) and the cost of production. The margin is something that the employees at the sales department actively work with and by experience Polarbröd has a good impression of what a preferable margin should be. The third parameter is price per kilo and price per product, since an estimation of volume is of particular interest. Through analyses and experience, Polarbröd has a good impression of what their consumers are willing to pay for their products, and the consumers pay most attention to price per product, not price per kilo.

For assessing the value potential, Polarbröd has for a significant amount of time done it in line with their core values of doing 'three times good'. They want to make bread that tastes good, that are good and nutritious for the people who eat it, and that it is sustainable for the planet. According to one respondent it was, and still is, difficult to assess what can be considered as a healthy product, because the definition of it is changing as well as the consumers' opinions about it. As the core values of Polarbröd implies, value in the development of new products was and is not solely considered from a financial perspective. An example of a product launched due to its strategic value potential was Product F. Polarbröd had for a long time considered themselves as a niched bakery, specialized on several products within the same product range. In effort to extend the range, Product F was developed. With its unique character the aim was to target new customers in the segment of flatbread, even though that segment might imply a less profitable product.

Other illustrations of strategically important products were Product C and Product D, which are considered to be siblings within the same product family. Both the products fulfilled a strategic role in their development by their similarity yet differences to other products of Polarbröd. They were constructed out of less complex dough, but presented in a brand new shape, making consumers think that they were highly innovative products. The strategic importance of these product developments was to update the assortment and keep the consumers interested. This could also contribute to extended face on the shelves in stores, since new products often receive more opportunities to get exposed.

Concluding, another example of a product with strategic value was Product G. The organic flatbread imposed a huge value creating opportunity due to its symbolic value of sustainability, which reflects one of the core values of Polarbröd. The respondents motivated

it by the fact that the consumers get to know Polarbröd in the shelves by investigating their products, and therefore, marketing a core value becomes extremely important.

### **4.3 Current Structure of Product Development & Portfolio Management**

#### **4.3.1 Structural Characteristics**

The respondents at Polarbröd explain that during the past couple of years, major reorganizations have been made within the company, which has contributed with significant implications on the product development process. Since February 2015 there is a new, more centralized approach to handle the product development within Polarbröd, with the aim of combining all the expertise of the employees in a better way. This effort emphasizes a portfolio management approach and is led by the Product Development Manager, who is in charge of creating the teams that are involved in the different projects and she is also the utterly responsible project manager. Today it exists three different teams, one for each bakery, which can be complemented by extended competence depending on the project type and its characteristics. These teams constitute the link between the strategic (product development, marketing and sales) and practical (production) efforts within the company, integrating units that prior have been rather independent functions. These different teams communicate with the management team through the bread meetings, where the most important decisions regarding the new projects are made. During these meetings the product development team have a supportive role towards the management that is ultimately responsible for the decisions that are made. This new organisation of the product development indicates a heavier market focus, reflecting the most significant driver for Polarbröd today. Moving from the bakeries and their production capacity as central, the organisation is now more focused on understanding the consumers and what they request. The characteristics of the bread industry are in general driven by the requests of consumers and the quick response time to trends that demand accurate consumer analysis, why Polarbröd finds it important to join this development. The product development has gained this market focus since the product development is a sub-function of the market department within Polarbröd, but also since it has become increasingly important to be able to respond fast to market changes in order to not be outcompeted.

##### **4.3.1.1 Portfolio Management and applied Models**

The process of product development is now centralized around a portfolio management approach. The respondents mean that this new approach enables the product development team, but also the management team, to receive a different understanding of the concept of product development through the more accessible way that the information is presented. Today, Polarbröd uses three portfolio management models; a Googol matrix, a risk-reward matrix, and a Stage-Gate canvas. The models are used with the purpose of creating structure and a holistic overview of the information to be able to consider all projects of a portfolio and thereby prioritize between them in a better way and allocate necessary resources. More specifically, the Googol matrix illustrates how Polarbröd allocates resources towards time (x-axis) and innovation pace (y-axis). The innovation pace is divided into business maintainers

and growth generators, where business maintainers are focused around keeping the assortment updated by products that generally do not contribute with significant volume, but rather sustain the present volume. Growth generators correspond to the projects that do not substitute existing volume, but generate new volume with their innovative character. Optimal projects of the two different categories are illustrated in a matrix where the resource allocation is distributed on a percent gradation and is used as a benchmark for the current projects at Polarbröd.

The risk-reward matrix illustrates the estimation of risk and potential new volumes of sales. The model shows that it could be beneficial to embrace a risky project if it implies large volumes, simultaneously as a high-risk project with low volume potential would not be preferable. The main purpose of the model is to illustrate the level of risk and how it is possible to minimize.

The Stage-Gate canvas illustrates the product development process and where a specific project exists. The y-axis of the model follows the same as in the Googol matrix, namely innovation pace represented by business maintainers and growth generators. The Stage-Gate canvas refers to the resource allocation of current projects and their position in the process. This indicates if prioritization between the projects is needed or if it is possible to allocate necessary resources at the specific time, which is decided by the management team during the bread meetings.

The respondents explain that the models are used to illustrate how complex the field of product development is, but in a simplified way. The models show several more aspects than time, which previously was used as a single parameter when considering projects. Several respondents conclude that developing new products is an interdependent activity and therefore it is both useful and necessary to make the information accessible to all involved individuals, and it should not be only the most involved person that understands the decision-making process. Now, it is easier for everyone to understand targets, markets and other relevant parameters that affect the development projects. This approach also contributes to a comprehensive view of the portfolio projects, which ultimately makes it simpler to assess the aggregated risk and value of the accumulated projects and to focus on the most relevant ones that are best for the entire company.

The product development at Polarbröd is often dependent on the size of the projects. The respondents explain that the projects can be defined as small, medium or large-scale projects, based on the innovation level that they contain. Usually the small projects correspond to 35-45 percent of the portfolio, the medium sized projects to 50-60 percent and the large projects to five percent. This makes the small projects correspond to minor, easy changes in product concepts that can be carried out by small or no investments. The decision-making process for these projects is less extensive. The medium sized projects are the most frequently conducted projects, and they usually involve significant risk and value components and a full decision-making process. Large-scale projects correspond to a minor fraction of the projects in the portfolios, and they include large risks in form of investments and market uncertainty, but in

return they can generate significant revenues. These projects contain an extensive decision-making process, in order to assure a good project outcome.

#### **4.3.1.2 Benefits with Portfolio Management**

A central part of the new structure is still to incorporate Polfärskt Bröd. Today the collaboration includes meetings held on several occasions per year. At these meetings Polfärskt Bröd provides Polarbröd with feedback and improvement suggestions, as well as constituting test-panel for prototypes. The respondents argue that this initiation is done to increase the transparency and involvement between the companies, to ultimately ease their collaboration and make it more effective.

Several respondents agree upon that the reorganization, and applying a portfolio management mind-set and models, has made the tasks around product development easier to manage and has created a way to easier visualize the tasks for all on-going projects simultaneously. For example, this is necessary to be able to prioritizing, allocating resources, deciding on number of projects and in constructing a beneficial project mix in the portfolio. This has, according to many respondents, eased the communication between people and departments and decreased the number of misunderstandings. Ultimately, this has resulted in a more efficient process, where decisions can be made faster and more easily. Simultaneously, it is easier for everyone to realize that a mix of both strategic projects and projects that will generate large volumes is necessary to possess in the portfolios. Another aspect that some respondents raised was that the application of portfolio management models has, due to its transparency, increased the understanding and respect for each individual's tasks and responsibilities within the company. The more distinct roles within the company has improved the internal collaboration significantly, and has enhanced the ability to make decisions in the interest of Polarbröd, not based on individual preferences. Simultaneously, the process of product development has gained a broader focus than only financial growth, to also include other types of value, such as strategic, internal and customer value.

According to one respondent, the three previously presented portfolio management models have made it possible for the management team to make decisions regarding large, long-term projects. This is a possibility that did not exist to a large extent before, since the prioritization often was focused around the upcoming launching window, and thereby other projects got deprioritized.

Although the new structure of developing products at Polarbröd is heavily focused on the markets and its consumers, it has had major impacts on the production as well. According to one respondent, it is by the three portfolio management models possible to get an overview of what ingredients that are possible to obtain for the different products and to see when they could be placed on the production line. It is perceived as easier to prioritize between projects and allocate necessary resources to them. The models also highlight the interdependency between production and market, which the respondent explains is much about finding sustainable synergies between market requests and production capacity.

#### **4.3.1.3 Drawbacks with Portfolio Management**

According to some respondents, a downside with the portfolio management approach is that the more formalized process requests more administration. To be able to structure the process, time plans, project plans and budgets are beneficial tools to use in order to control and measure the process. However, everyone is not used to these procedures. One respondent highlights the benefit of the division by project types, whereas the small-scale projects still requests fairly little administration and more flexibility, and the large-scale projects are more formalized, which is needed to make them successful. Nevertheless, the background research and administration contributes to making the projects efficient and is thereby necessary. This approach also contributes to a centralized focus of NPDs, that the projects benefit Polarbröd and not anyone's personal interest, which the former approach stronger incentivised towards. Several respondents agree to the beneficial situation of the new approach on this aspect. Another respondent highlights the increased administration as a potential factor that some employees do not bother contributing with new product ideas, since they perceive the process as too formalized and complex.

#### **4.3.2 Decision-Making in Portfolio Management**

Currently, the decisions for development projects are made with the support of the three portfolio management models; the Googol matrix, the risk-reward matrix, and the Stage-Gate canvas. The Stage-Gate canvas illustrates what type and how much resources each project need for the different phases that they are currently in, and provides an opportunity to visualize the distribution of the projects through bubbles of different colours and sizes, reflecting size and importance of the projects. The Stage-Gate canvas is beneficially used in combination with the Googol matrix and the risk-reward matrix, in order to make accurate decisions around the characteristics of the projects and its inherited risk and value potential. These models are often managed by the most involved employees from the product development department, but presented and explained to all participants at the bread meetings in order to create a collective understanding. Ultimately, the decisions are made through the discussion and judgment of the management team during the bread meetings and the experts on innovation and product development. As well do other involved employees for each specific project possess a supportive, not a decisive, role in these situations.

This decision-making process usually differs, depending on the size of the project. According to several respondents, it usually includes more freedom to conduct small sized projects, compared to medium and large sized projects. For the small-scale projects, the decision-making process is often less formal and more flexible. These small projects do not have to be discussed at the bread meetings, as the employees are trusted to individually handle them in a beneficial way. Smaller projects often come from customer or consumer requests, which from a production perspective is easy to manage. Therefore these are low-risk projects, but still value adding, foremost from a strategic perspective. This can be explained by the fact that consumers usually perceive bread presented in a new shape, but made out of the same dough, as a completely new product. Although, conducting small projects are somewhat



dependent on the amount of other active projects, which requests transparency and good communication between the employees at Polarbröd.

Several respondents highlight the benefits of having a more central and structured decision-making process that exists today for managing the development projects. Now, many decisions are based on analyses and the weighted judgement from all the competences present during the bread meetings, instead of individual preferences of testing new concepts. Several respondents highlighted the importance of the three models for making it possible to easier visualize the situation and to force the management team to prioritize between projects. This also makes it more manageable to handle the multiple-market presence of Polarbröd. Today, the product development decisions are made in the interest of Polarbröd, which makes it easier to get a comprehensive view and understanding of the portfolio. Although, there are some conflicts between the past and current way of working with product development, as well as between the market and production departments, and this has created a slight division between the employees. The company will soon face a generation change, and employees from the older generations are slightly stuck in the old way of working with some unwillingness to change, simultaneously as the younger employees strongly advocates change and new ways of working. Polarbröd is a company with a long and rich history, and has always been centralized around the art of baking bread. Today, the focus is more on the market and on its consumers, since that is what the competitive environment requests. Respondents explain that they mitigate this generation gap by providing clear frameworks and transparency in their way of working, which seems to be successful for now, but it also requests continuous work.

### **4.3.3 Risk Assessment of the Projects**

By applying a portfolio management approach, several respondents explain that the process of assessing risk gets easier. The portfolio management models provide a systematic way of considering risk, and it is more manageable to keep the risk on a balanced level by combining different types of projects in the portfolio. This also allows the employees to consider more risk parameters and keeping open discussions about it during the bread meetings, where everyone can be more involved today. Being able to include all the perspectives during the bread meetings contributes to a more complete and accurate risk assessment. One respondent emphasis that the current risk assessment can be done more coherently and it is also beneficial that it can be done collectively. It is easier to visualize the risks when applying the models and that also helps everyone in the process of assessing it. Depending on your position, personal preferences and experiences, your assessment can become biased and result in different outcomes, but this get visualized in the models. The models are helpful in visualizing the differences and make it possible to discuss and change the assessment.

Today, Polarbröd is working with risk from different perspectives to be able to assess the riskiness of the projects. The group participating in the bread meetings is consisting of individuals with different competences, and they represent both the market perspective and the production perspective of the company. The individuals with market insights have knowledge of innovation and product development, market mechanisms and consumers as

well as sales. The individuals with production insights know more about quality and development, nutrition and ingredients, baking and the technical production. The combined perspective gives a solid foundation for making a qualified risk assessment.

From a market perspective, factors that need to be assessed carefully are according to the respondents' trends, the demand and the purchasing power of consumers as well as their characteristics, to launch in the right time, and to be able to work with the niche concept of Polarbröd without too much cannibalization. Sales is also an important part, where competitors are carefully analysed, as well as more general food trends and the role of bread in those. For example, choosing to focus on the larger, safer markets (Sweden, Norway) usually means that the product will reach a break-even point within one or two years, but it can be a risk in choosing to focus on a smaller market. However, focusing on a smaller market can at the same time be value adding and developing for Polarbröd. It is also important to understand and access the consumers of different markets, since a risk could be that cultural values and habits separate how and why the consumer eats the bread.

The production perspective includes risk aspects related to ingredients, if they are possible to buy or if they are scarce, production changes or extensions, if it is possible to test-bake and produce and in which bakery, and if it is necessary to make investments in new machines etcetera. The management of ingredients is especially evident when producing ecological products, where the ingredients have to be handled separately according to law, which usually requests new routines in the facilities. For example, a brand new baking technique could imply a large production risk since it adds much uncertainty to the whole project, which is difficult to estimate. To manage this effectively, a continuous and open communication between the bakery and the quality and development department is necessary, with the effort of trying to mitigate the risk as much as possible. Also, new machines represent the largest financial risk in the development projects and making a large investment in a production facility for a specific product is in general a highly risky decision, according to one respondent.

On an overall level, the respondents stated that time and financial aspects are risky factors that are crucial to assess. One respondent explained that time is a significant risk factor, since timing is a crucial component to address within the bread industry. If it takes much time to develop a product, it is difficult and risky to assume that it is possible to follow the consumer trends. Due to the extremely competitive environment it is crucial to be quick in launching new products, as the competitors otherwise will do it and capture important market shares. To also be able to think about productivity and sustainability, which is strong aspects in the profile of Polarbröd, it is difficult to be flexible in the production since this imposes a risky situation in itself.

Another aspect that includes major risk is that many of the most successful products in the product portfolio, in terms of revenue, are extremely mature. Due to the characteristics of the fast changing markets, it is of interest to extend the current markets and product offerings. This is a challenge that requests Polarbröd to enter new and unfamiliar markets, in order to

stay competitive and will impose highly risky situations when conducting these large-scale projects in the new markets. It is also a significant risk in only producing short series of several types of products, as the situation in the bakery in Bredbyn. This since it becomes more difficult to assure a high quality of the products due to the loss in know-how of the employees. The risk components that specifically are assessed, and how they practically are approached at Polarbröd, are concluded in Table 4.1.

**Table 4.1** Risk Assessed at Polarbröd

Type of Risk	Criteria	Practical Assessment
<b>Market Risk</b>	Sales Potential	<ul style="list-style-type: none"> <li>- Trends (Consumer &amp; General Food Trends)</li> <li>- Demand</li> <li>- Purchasing Power</li> <li>- Timing (launch)</li> <li>- Cannibalization</li> <li>- Sales (Profitability, Margin, Price per Kilo, Price per Product)</li> <li>- Competitors</li> <li>- Market Characteristics &amp; Size</li> </ul>
<b>Production Risk</b>	Production Possibility	<ul style="list-style-type: none"> <li>- Product Characteristics</li> <li>- Ingredients (Price, Availability, Handling)</li> <li>- Test-baking</li> <li>- Facility Investments</li> <li>- Production Capacity</li> <li>- Production Changes</li> <li>- Location (which Bakery)</li> <li>- Baking Technique</li> </ul>

#### 4.3.4 Value Assessment of the Projects

All the respondents at Polarbröd considered value to be closely connected to the concept of risk, and they agreed upon that risk and value could be considered as two sides of the same coin. Assessing value is therefore similar to assessing risk, and much is considered from a market perspective and a production perspective, including the same functions and expertise as for the risk assessment. Although, somewhat larger emphasis is put on the market and sales perspective, since the value potential often is considered from a financial perspective, in terms of profitability, margin, price per kilo, and price per product. The main aim when developing a new product at Polarbröd is usually to generate a profit from it. This is assessed by careful statistical analyses on data regarding competing products, their prices and sales figures. This statistics evaluates how Polarbröd's products can be priced, it can give volume estimations and estimations of cannibalization within the product families. This process also includes a more relative judgement of what group the product can target and how it can be targeted. Ultimately, this will show the financial value of the product. However, there is, in similarity to the risk assessment, no existing checklist for how to assess the value of a project, but rather are relevant parameters discussed for each project.

The respondents explained that the products also could be assessed from the perspective of strategic value, meaning that a product can add something more than financial value. This is

another reason for why the portfolio management is a beneficial approach when it gives a better overall view of the products. A product can for example add strategic value by having a sustainability profile, opening up to a new market, by adding value to the brand or by satisfying a significant customer. One respondent explained the non-financial value parameters as connected to the core values of Polarbröd; that they try to do three times good. They want to make bread that tastes good, that are good and nutritious for the people who eat it, and that it is good and sustainable for the planet.

On a specific level, the value parameters are in many cases as mentioned the opposite of the risk parameters. For example, while it incorporates a lot of risk to enter new markets, it can also contribute with significant value to the brand of Polarbröd. If entering those new markets in the right time, it might be possible to gain a competitive position there, simultaneously as cannibalization will be less of an issue. Another example could be that even though a new baking technique imposes a significant production risk, it can generate a large profit. The value components that specifically are assessed, and how they practically are approached at Polarbröd, are concluded in Table 4.2.

**Table 4.2** Value Assessed at Polarbröd

Type of Value	Criteria	Practical Assessment
<b>Market Value</b>	Potential Sales Volume	<ul style="list-style-type: none"> <li>- Sales (Profitability, Margin, Price per Kilo, Price per Product)</li> <li>- Competing Products: Sales &amp; Prices</li> <li>- Market Characteristics &amp; Size</li> <li>- Product Characteristics (Strategic &amp; Financial)</li> <li>- Trends (Consumer &amp; General Food Trends)</li> <li>- Demand</li> <li>- Purchasing Power</li> <li>- Timing (Launch)</li> <li>- Cannibalization</li> </ul>
<b>Production Value</b>	Production Possibility	<ul style="list-style-type: none"> <li>- Ingredients (Price, Availability, Handling)</li> <li>- Test-baking</li> <li>- Facility Investments</li> <li>- Production Capacity</li> <li>- Production Changes</li> <li>- Location (which bakery)</li> <li>- Baking Technique</li> </ul>

#### 4.3.5 Risk and Value Potential of the Projects

The respondents argued that it is not possible to detect a clear relationship between high-risk projects and high-value projects. Sometimes high-risk projects lead to more value than low-risk projects, but that is not always the case. The respondents mean that the value created is not a result of how innovative and risky a product is from a company perspective, but instead it is dependent on how the consumers perceive the product. An example of this was Jubileumskakan, a low-risk project for Polarbröd, since it was made out of already existing dough, but presented in a new format. The consumers registered this as a highly innovative,

new product and it generated significant sales for Polarbröd, meaning that this was a low-risk project that became a high-value project. This example also illustrates that what might have been a high-risk project for Polarbröd have no impact on the created value of the project, it is more about delivering the right product to the market.

#### 4.4 Concluding Remarks

Following, a summary of the discussed assessment parameters for decision-making regarding risk and value assessed at Polarbröd is presented (Table 4.3). The definition of risk, made by Polarbröd, corresponds to risk as consistent of market risk and production risk, simultaneously as the value is defined as consistent of market value and production value.

**Table 4.3** Risk and Value Assessed at Polarbröd

Type of Risk/ Value	Criteria	Practical Assessment
<b>Market Risk</b>	Sales Potential	<ul style="list-style-type: none"> <li>- Trends (Consumer &amp; General Food Trends)</li> <li>- Demand</li> <li>- Purchasing Power</li> <li>- Timing (launch)</li> <li>- Cannibalization</li> <li>- Sales (Profitability, Margin, Price per Kilo, Price per Product)</li> <li>- Competitors</li> <li>- Market Characteristics &amp; Size</li> </ul>
<b>Production Risk</b>	Production Possibility	<ul style="list-style-type: none"> <li>- Product Characteristics</li> <li>- Ingredients (Price, Availability, Handling)</li> <li>- Test-baking</li> <li>- Facility Investments</li> <li>- Production Capacity</li> <li>- Production Changes</li> <li>- Location (which Bakery)</li> <li>- Baking Technique</li> </ul>
<b>Market Value</b>	Potential Sales Volume	<ul style="list-style-type: none"> <li>- Sales (Profitability, Margin, Price per Kilo, Price per Product)</li> <li>- Competing Products: Sales &amp; Prices</li> <li>- Market Characteristics &amp; Size</li> <li>- Product Characteristics (Strategic &amp; Financial)</li> <li>- Trends (Consumer &amp; General Food Trends)</li> <li>- Demand</li> <li>- Purchasing Power</li> <li>- Timing (Launch)</li> <li>- Cannibalization</li> </ul>
<b>Production Value</b>	Production Possibility	<ul style="list-style-type: none"> <li>- Ingredients (Price, Availability, Handling)</li> <li>- Test-baking</li> <li>- Facility Investments</li> <li>- Production Capacity</li> <li>- Production Changes</li> <li>- Location (which bakery)</li> <li>- Baking Technique</li> </ul>

## 4.5 Improvement Potential and Improvement Strategy

Even though all the respondents referred to the new approach of portfolio management in the product development as something positive, they all mentioned that it still exist improvement potential. Several respondents explained that they like the development of how Polarbröd has evolved during the past decade, going from highly impulsive product development where almost all projects got accepted, to a structured approach where projects get selected based on evaluation criteria. This makes it more fun and committing to be involved in the projects because they often result in something tangible. However, some respondents claim that saying no is something that they can become even better on. The use of models as decision-making support can beneficially be developed further and adjusted to the specific situation of Polarbröd to make the product development efforts more effective. The models can also be used to further visualize and simplify the complex field of product development in a better way. Other respondents perceive this formalized process as inhibitory and believe that it makes people hesitant to contribute with ideas, since many of these ideas do not get selected. Nevertheless, if the ideas do get selected, the process is rigid and slow moving compared to before, which makes it more difficult to launch products on time.

One respondent highlighted the importance of good collaboration with Polfärskt Bröd as an area of improvement. Even though there is a plan for how the collaboration will look like, it is a newly initiated effort that requests attention and monitoring. The collaboration with Polfärskt Bröd constitutes many advantages, such as flexibility, entrepreneurial engagement and closeness to consumers, compared to larger companies in the market. At the same time, as Polfärskt Bröd is managed by independent companies, it becomes more difficult for Polarbröd to control and decide for the whole value chain, why good collaboration is critical.

One other major aspect of improvement, mentioned by several respondents, is to learn from past experiences. To more thoroughly investigate the outcome of past projects to detect what a successful and an unsuccessful approach look like, and to implement that into the present and future decision-making. This process of learning and reflection would be beneficial to integrate into the product development process and is closely connected to the aspect of prioritization. One respondent claimed that the product portfolio sometimes could be considered as too large, probably as an effect of Polarbröd's prior inability to reject projects. Therefore it is of major importance to be able to prioritize between the projects and be strict on which project that should proceed to launch. This would also help Polarbröd in finding which specific markets to be present in, to be able to grow in a structured and committed manner.

Connected to the importance of learning from past experiences, one respondent emphasis improvement potential when it comes to internally sharing mistakes as well as success stories, to be able to enhance the future NPD at Polarbröd. This would make the process more efficient, and more mutual between the employees, resulting in a less harsh culture and avoiding people to make the same mistake by themselves, as someone else just did. According to the respondent, this is much due to the history of having three rather

independent bakeries with a somewhat rivalry attitude to each other, and even though the integration between them has become better, there is still much to improve. The geographical distances between the sites could partially explain this independency.

From a more internal perspective, something that can be improved within Polarbröd is the solid competence of baking. One respondent explains that there exists a lot of competence of how to produce bread in an effective way, but possessing someone that has high skills in the craft of baking would be beneficial in many ways, and help Polarbröd attaching to its core values and concept, especially in the process of developing new products. Today, Polarbröd is acquiring this competence from external consultants, but it would be beneficial for the future to have someone that is fully committed to the baking, to be able to respond to trends faster and try out new concepts.

Improvement potential also lies in the cultural aspects of Polarbröd. As previously explained, there is a misalignment between the generations and departments within Polarbröd and thereby how to approach certain tasks without losing the cultural values. Several respondents see that this is an important issue, much due to the fact that Polarbröd has a strong cultural profile and a long history. One respondent claims that this needs more efforts than new models and routines for working, meaning that it requests an active endeavour to show why it is beneficial to have a more centralized product development.

Several respondents also highlight the aspect of tapping into new markets as an improvement aspect. One respondent explained it as, for Polarbröd to be competitive in the future entering new markets is a necessity. This requests Polarbröd to become better in understanding consumers outside their core market of Sweden and focus on strategizing for other consumer groups. Another motivation for entering new markets would be that the Swedish consumer market, the largest market of Polarbröd today, is heavily controlled by the retail and grocery chains. They are currently launching products under their own brands, which makes it even more difficult for the suppliers to gain shelf space. From an internal perspective, this means that Polarbröd needs to extend their current product selection.

Concluding, several respondents argued that using models for assessing the situation could be a possible solution of how to improve the product development, but not a universal solution. Models for structuring the way of making decisions, with different criteria that together would constitute a total assessment of a situation would be beneficial on a specific level for those who work with the specific product development, but not on a general level for the management team. One respondent explained that it would be difficult to find a model that suits everyone, due to the complexity of the product development field. The best thing a model could contribute with would be to simplify the situation and create an overview that is accessible for individuals that are engaged on different levels. However, it is difficult to find that balance. Another respondent considered the current portfolio management models to do exactly that, and did not see a need for more models.

## 5. Analysis

*This chapter presents a discussion and analysis based on a comparison of the empirical findings and the theoretical framework. The structure of the chapter follows the same as for the empirical findings and highlights the characteristics of the Swedish bread industry, the development of decision-making regarding risk and value assessment, as well as the effect of portfolio management on the decision-making process. This chapter provides the motivation to the recommendation that is presented in the final chapter.*

### 5.1 Characteristics of the Bread Industry

Today, Polarbröd is experiencing that it is difficult to launch new products that successfully penetrate the market. The respondents at Polarbröd mean that this can be explained by the intense competitive situation of the bread industry and the increased bargaining power of the retail and grocery chains that decide what products will be in the store shelves. The perception of strong bargain power of the retail and grocery chains stays congruent with the study conducted by Kingley and Hollingsworth (2003), who argues for the significant impact of these actors in the development and launching of new products. Nevertheless, the general competition within the industry is also described as intense (Dicken, 2011) and requires companies to steadily present new products to remain competitive in the marketplace. Polarbröd states that it is an excessive situation to continuously be able to deliver new products at a rapid pace, as for the three launching windows every year.

As the industry is driven by consumer demand, new products must be relevant in relation to the current trends and demand in the market in order to convince the retail and grocery chains about the value potential of it. However, according to existing literature (Dicken, 2011) and the conception of Polarbröd, this is not an easy task. As trends and demand constantly change and vary significantly between different markets, companies steadily have to update their assortments and develop new products. This has made it incredibly important to pursue in-depth consumer research in the development of new products (Rudolph, 1995) and this is also why it is common among companies such as Polarbröd to take advantage of external resources to facilitate and enhance the NPD processes. Anderson and Woolley (2002) also claim this to be necessary, in order to deliver new products of high pace and with good quality.

Another aspect discussed by Dicken (2011) is the influence of regulation and restrictions that can have a significant impact on the development of new products within the industry and need to be taken into consideration when assessing a new product's ability to fit along the entire value chain. This aspect was especially highlighted by Polarbröd's explanation of developing organic products, where strict rules regarding the handling of the ingredients requests them to invest in their production facilities, which ultimately implies much risk. Furthermore, since the competitiveness of the industry has become more intense, it requires companies to steadily invest and innovate in new solutions in order to manage the fast changes in the market. As the existing literature emphasizes, the industry has progressively become industrialized (Bonanno et al., 1994; Roberts, 2008; Ward & Almås, 1997; Watts &



Goodman, 1997; Wilkinson, 2002) and Polarbröd continuously needs to invest in their production plants, in order to efficiently be able to develop and produce their products.

## **5.2 Past Structure of the Product Development**

Before applying the portfolio management approach, Polarbröd had a more unstructured way of developing new products, where individuals almost could pursue their own projects and where the bakeries operated as three independent units. As the company grew and the markets became more intense, Polarbröd detected inefficiencies and downsides with this informal approach, even though it implied much freedom for the people that came up with new product concepts. Especially due to the inefficient collaboration with Pöfärskt Bröd, that constitutes the last link towards the customers, all parts of the value chain were not integrated in a beneficial way. In 2009, the PPS-model was introduced with the aim of creating some structure in the situation and to decrease the deficiencies within Polarbröd. The PPS-model provided a type of Stage-Gate canvas, allowing the people involved in the projects to see its progress, and making it easier to make decisions. In the same era, a significant categorization effort was made to understand the consumers in a more accurate way.

### **5.2.1 Decision-Making of the Projects**

The PPS-model supported the decision-making of the product development projects at Polarbröd. By its Stage-Gate format and the emphasis on analyses to support the reasoning, the model formalized the process to a great extent, compared to the situation before the PPS-model was introduced. The model allowed both the project team and the management team to make more accurate judgements and decisions at the bread meetings, but the decisions were still largely based on personal opinions and feelings. The model showed the projects individually and not in relation to each other, which made the management team accept many projects that would not have been prioritized if it were possible to see the whole portfolio. This resulted in poor outcomes of several products, since they were not assessed in an objective way. The way of independently viewing the projects (simultaneously as the bakeries operated independently) led to decisions made in the interest of specific bakeries and not in the interest of Polarbröd. A problem was also that the bakeries did not share information or knowledge with each other, and did not emphasise a transparent way of operating.

According to the reasoning of the respondents it is detectable that the decision-making process was mainly run by opinions and power, but not by evidence (Griffin et al., 2011). The lack of a portfolio mindset made it difficult to see the projects in relation to each other and thereby it became harder to prioritize. That opinions of the personnel at Polarbröd ran the decision-making was clearly illustrated in the development of project A, where the project did not follow the process, but the management team liked the concept and let it proceed. By only having the PPS-model, it was also difficult to integrate the business strategy and the broader technology planning to the development process (Oh, Yang & Lee, 2012) and it did not give a holistic perspective of the situation. The lack of an overview of all the projects also

made it extremely difficult to conduct long-term projects that could contribute with more than fulfilling short-term goals.

### **5.2.2 Risk and Value Assessment of the Projects**

The risk of the development projects was assessed through the pre-study of the PPS-model. This included the three perspectives of market, bakery, and recipe and dough. The factor that was heavily emphasised by the respondents of Polarbröd was financial risk through investments, but they also detected that the projects could imply a production risk, if they would be difficult to produce, or by using new ingredients. They also detected the risk of cannibalization within the product families.

Similar to the risk, value was assessed through the PPS-model's pre-study. It was considered from an external market perspective and an internal production perspective. Foremost, the financial potential of sales was assessed but sometimes the projects imposed strategic value as well, for example through fulfilling the core values of Polarbröd, or extending their existing product families.

Concluding, since the assessment of risk and value was done individually for each project and not from a portfolio management approach, it was difficult for Polarbröd to make an estimation that reflected the real competences of the employees and the situation of the project. This separation approach did not allow them to consider the interdependencies between different projects assessments, nor the interdependencies between the qualities of Polarbröd itself (Bowman & Ambrosini, 2000). This excludes both risk and value components, that might have been of significant importance in the estimation (Project Management Institute, 2008). The specific components of risk and value can be considered as fairly comprehensive, although they do not cover all necessary aspects and they are not specific enough, compared to the definitions of this study (Davis, 2002; Marr, Schiuma & Neely, 2004).

## **5.3 Current Structure of Product Development & Portfolio Management**

Compared to the former way of working with product development within Polarbröd, it is today done through a centralized organisation, with the Product Development Manager as the utterly responsible person for organizing the project teams and coordinating the work. There are three project teams, which are complemented according to the expertise needed in the specific projects, and major decisions are made at the bread meetings where the management team is active and the project team is supporting. This reorganisation was done with the purpose of unifying the product development within Polarbröd, which previously did not exceed the expectations and targets, nor stood in line with the goals of the company, which is the main purpose of portfolio management (Cooper, Edgett & Kleinschmidt, 2001).

Since the product development at Polarbröd has a heavy focus on both the market and its consumers, and the internal production, it becomes a complex process to develop new products. It is both about "doing the right projects" and "doing projects right", which requests

a systematic way of allocating the limited resources of the company (Hunt & Killen, 2008). Polarbröd is using three models for its portfolio management; a Googol matrix, a risk-reward matrix, and a Stage-Gate canvas. These three tools help Polarbröd in getting a comprehensive overview of the portfolio, its size, what characteristic the different projects contain resulting in an estimation of risk and value potential, that ultimately gives an estimation of the performance of the all development projects at Polarbröd. These models facilitates for all parties to understand the complex topic of product development and ease the communication and transparency between everyone involved in the process. Applying these models helps Polarbröd to manage their portfolio in a formal way, something that is rare among companies today (Khurana & Rosenthal, 1997).

We can conclude that the respondents at Polarbröd has mentioned all the aspects that Cooper, Edgett and Kleinschmidt (2001) highlight regarding why portfolio management is of significant importance; financial motives, to maintain a competitive positioning in the market, to allocate resources efficiently, to address the strategic issue of merging project selection and business strategy, to focus on the specific number of projects, to achieve balance between short-term and long-term and high-risk and low-risk projects, to communicate prioritization and to provide better objectivity in the project selection. However, the emphasis put on the different ones vary significantly, but financial motives are still the strongest within Polarbröd, which limit them in their product development. Based on the definition of a best practice made by Camp (1998), “A best practice in portfolio management is linked to improved business performance and can differ widely”, Polarbröd is applying a suitable combination of portfolio management models, since their new product development process have contributed to better performance of the company, compared to the previous situation. The opinions of the employees at Polarbröd considered factors that affects performance to be matching with the specific best practices defined by Cooper, Edgett and Kleinschmidt (2004). This also explains why the three models (the Googol matrix, the risk-reward matrix and the stage-gate canvas) are combined in the way that they are.

Something identified as important at Polarbröd is their large emphasis on the individuals behind the models and behind the craft of baking and innovating bread. Polarbröd has a long history of producing cultural valuable products, representing a significant part of the Swedish bread culture. There seemed to be an awareness of the biases in the development process, and that decisions were based on expertise, feelings and indications from the models, not objectively. Even though the aim of introducing the models was to create a better overview and understanding of the product development for everyone involved, and thereby minimize the objectivity and incentives towards personal winning, Polarbröd does not seem to be bothered by the human factor too much. This reasoning is all in line with Christiansen and Varnes (2008) alternative of best practice. We also see that this is one of the competences that differentiate Polarbröd for their competitors.

### **5.3.1 Decision-Making in Portfolio Management**

The decision-making system for development projects at Polarbröd is founded in the three portfolio management models. Specifically, the Stage-Gate canvas lays a foundation for

decisions regarding resource allocation, in relation to where other projects are in the process. The risk-reward matrix and the Googol matrix complement the canvas by showing the characteristics of the projects, what type of project it is, and its potential. All the models are visualized in the form of bubble diagrams, with bubbles representing different types of projects dependent on their colour.

The decisions are made at the bread meetings where the management team and the project team discuss and decide on necessary aspects for the projects. Often, the projects discussed in these meetings are medium or large sized projects, something that previously was very difficult to assess in an accurate way, without having a comprehensive view of all active projects. The models lay a foundation for prioritizing between projects, and make decisions in the interest of Polarbröd. Small sized development projects within Polarbröd have a different decision-making process. They can either be conducted by a single project group or by a single person, rather independently. Since these projects requests minor changes to an existing product, a discussion with the involved bakery is usually enough before starting producing and selling the product.

The purpose of the decision-making system is clear; it is used for evaluating, prioritizing, and allocating resources between the projects. Other than that, the models have enhanced the way of sharing information between individuals and departments, simultaneously as it has increased the understanding of product development for everyone involved, all in line with Oh, Yang and Lee (2012). However, the current decision-making process within Polarbröd cannot be considered as more rapid, but yet, much more effective and transparent. It also includes both a short-term and long-term perspective, which makes it easier to link the business strategy to the production planning (Oh, Yang & Lee, 2012).

The process is now a mix of evidence-based and power-based decision-making on the fact that more careful analyses are made through the models before decisions are made, as well as there is a more comprehensive picture of the full portfolio. The power-based decision-making exists when the management team is responsible for making the final decisions. However, this approach can be considered to be less biased than before and more focused around the interest of Polarbröd. The models by themselves correspond to the category of the strategic management approach, defined by Barczak, Griffin and Kahn (2009), and they are used to achieve a balanced portfolio. The three models are a mix of bubble diagrams, portfolio maps, and strategic bucket.

### 5.3.2 Risk Assessment in Portfolio Management

Type of Risk	Criteria	Practical Assessment Theory	Practical Assessment Polarbröd	Coherence
<b>Market Risk</b> (Davis, 2002; Day, 2007)	Value Chain & Market Assessment	- Sales force		<input type="checkbox"/>
		- Distribution channels		<input type="checkbox"/>
		- Manufacturing capabilities	- Product Characteristics - Ingredients (Price, Availability, Handling) - Test-baking - Facility Investments - Production Capacity - Production Changes - Location (which Bakery)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		- Customer support		<input type="checkbox"/>
		- Presence in the market	- Competitors - Market Characteristics & Size - Timing (launch) - Sales (Profitability, Margin, Price per Kilo, Price per Product) - General Food Trends	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Technical Risk</b> (Davis, 2007)	Innovation & Capability Assessment	- Technology and current use of it	- Baking Technique - Product Characteristics - Ingredients (Price, Availability, Handling)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		- Capabilities of development team		<input type="checkbox"/>
		- Capabilities of supporting program management		<input type="checkbox"/>

<b>User Risk</b> (Davis, 2002; Day, 2007)	Interaction & Specification Assessment	- Design and performance specification are known	- Consumer Trends - Demand - Purchasing Power - Cannibalization	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		- Attributes of user interaction with the product are known	- Consumer Trends - Demand - Purchasing Power - Cannibalization	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

**Table 5.1** Differences in Risk Assessment between Theories & Polarbröd

Concluding from the empirical findings and the theoretical framework, Polarbröd defines and assess risk somewhat differently than the highlighted theories do, as illustrated in Table 5.1. The development projects at Polarbröd are divided into the categories small (35-45 percent), medium (50-60 percent) and large (5 percent), depending on their innovation level. This corresponds to the similar definition of small is and big is (Day, 2007) and makes it easier to manage the projects. The division between the three categories corresponds to a relatively short-term portfolio, with a smaller focus on high-risk projects, which beneficially could be improved in order to generate a larger profit (Day, 2007).

The riskiness of the development projects at Polarbröd gets assessed through the three portfolio management models (the Googol matrix, the risk-reward matrix and the Stage-Gate canvas), but also through analyses from the perspectives of market (external) and production (internal). The market perspective includes factors regarding the market, but foremost about the consumers. Specifically, trends, demands, purchasing power, customer characteristics and launching times are assessed from a risk perspective. Additionally, sale is referred to as an important part of the market perspective, where the risk assessment is focused around competitors and broader food trends. The production perspective incorporates specific risk components regarding ingredients characteristics, handling and availability, production changes and extensions and if these need investments, scheduled test-baking, production capacity and prioritization between bakeries. The internally defined market risk and production risk are directly comparable to the definitions of market risk, technical risk, and user risk (Davis, 2002). These risks are on a general level assessed through financial valuation, through separation of risk and value to combine them in a beneficial portfolio, and through scoring models (Cooper, Edgett & Kleinschmidt, 1998). It has especially been evident at Polarbröd that using the scoring models are beneficial in the early stages of the process to create an overview, consistent with research (Szwejcowski & Mitchell, 2008). The respondents at Polarbröd also explained that the market perspective and the production perspective constitute a mix of financial and strategic risk. The financial risk is concerned with investments, while the strategic risk regards targeting a new market segment or deliberately launching a product with lower financial potential since it can bring strategic value to Polarbröd. This is also incorporated in the definitions by Davis (2002).

Although the internal definition of risks at Polarbröd and the theoretical definitions that are highlighted (Davis, 2002; Day, 2007) in this study are different, they contain similar components. The risks at Polarbröd are evaluated in a comparable way as Davis (2002) suggests, but it does not exist a formal checklist to follow while assessing the risks, which beneficially could be added into their routines. Polarbröd can be considered as having flexibility and responsiveness in their risk assessment, due to the size of the company and their rather new routines, but making the product development more effective requests a wider scope of their risk assessment models. Further on, combining the perspectives of market and production risk in a matrix to detect the expected return and chances for successful launch according to the model by Davis (2002) is currently not made at Polarbröd, but could be implemented. They estimate the project type in their Googol matrix and assess

risk towards value (sales volume) in their risk-reward matrix. Beneficial would be to create a model that combines these approaches, with a specification on the type of risk, as in Figure 3.2. Also, while combining the different types and perspectives of risks, additional factors can be assessed since the projects no longer get considered independently (Olsson, 2008).

On a specific level, there are aspects of risk that Polarbröd could complement their current assessment with. Imposing that a change towards the division of market risk, technical risk, and user risk is made, the component of market risk could be extended on the aspects of sales force, distribution network (Polfärskt Bröd for the Swedish consumer market) and customer service. Currently, these aspects are not assessed as risk components, however they are discussed internally at Polarbröd. We see that for example the components of distribution network and sales force will be even more critical to assess when Polarbröd will enter new foreign markets where external agents are used, hence for long-term projects. The distribution network, with risk assessment of suppliers' etcetera is also another aspect to add to the framework. Further, Polarbröd's customer service needs to be considered as a risk component in terms of availability for and communication to their customers.

For complementing the perspective of technical risk, Polarbröd should assess their internal capabilities and knowledge of technical aspects in the development teams and of the management support team. This would be especially important in development projects that are dependent on new technology, when the development team and management team have limited experiences of similar projects, or when Polarbröd integrate external resources into the development projects. The assessment of user risk is already done extensively at Polarbröd, although, this will be a larger challenge when renewing the product selection and tapping into new markets.



### 5.3.3 Value Assessment in Portfolio Management

Type of Value	Criteria	Practical Assessment Theory	Practical Assessment Polarbröd	Coherence
<b>Financial Value</b> (Day, 2007)	Profitability at a Specified Risk Level	- Calculate ROA, ROI, profit margin	- Margin	<input type="checkbox"/>
		- Relative estimate of profitability on an acceptable level of risk		<input type="checkbox"/>
		- Forecasted returns	- Sales (Profitability, Price per Kilo, Price per Product)	<input type="checkbox"/>
		- Risk level	- Facility Investments	<input type="checkbox"/>
<b>Customer Value</b> (Day, 2007; Solomon, 2015)	Market Potential	- Need/ desire for the product	- Trends (Consumer & General Food Trends) - Demand - Timing (Launch)	<input type="checkbox"/>
		- Willingness to buy	- Purchasing Power	<input type="checkbox"/>
		- Size of the market	- Market Characteristics & Size	<input type="checkbox"/>
		- Customer satisfaction		<input type="checkbox"/>
		- Customer loyalty	- Cannibalization	<input type="checkbox"/>
		- Brand awareness		<input type="checkbox"/>
<b>Internal Value</b> (Day, 2007)	Product Potential	- Clear product concept for external and internal purposes	- Product Characteristics (Strategic & Financial)	<input type="checkbox"/>
		- Possible to manufacture	- Ingredients (Price, Availability, Handling) - Test-baking - Production Capacity - Production Changes - Location (which bakery) - Baking Technique	<input type="checkbox"/>
		- Satisfaction of the market	- Market Characteristics & Size - Purchasing Power	<input type="checkbox"/>
				<input type="checkbox"/>
<b>Internal Value</b> (Day, 2007)	Product Competitiveness	- (Sustained) competitive advantage		<input type="checkbox"/>
		- Competitors reactions	- Competing Products: Sales & Prices	<input type="checkbox"/>

<b>Learning &amp; Growth Value</b> (Day, 2007)	Strategic Sense to Launch	- Match with overall growth strategy	<input type="checkbox"/>
		- Support by the top management	<input type="checkbox"/>
<b>Learning &amp; Growth Value</b> (Day, 2007; Oh, Yang & Lee, 2012)	Company Competitiveness	- Superior resources	<input type="checkbox"/>
		- Appropriate management	<input type="checkbox"/>
		- Ability to respond to the market	<input type="checkbox"/>
		- Models: bubble diagrams, portfolio maps, strategic buckets	<input type="checkbox"/>

**Table 5.2** Differences in Risk Assessment between Theories & Polarbröd

Concluding from the empirical findings and the theoretical framework, Polarbröd also define and assess value differently than the highlighted theories of this study (Table 5.2). Value of the development projects at Polarbröd is assessed in a similar way as the risk factors, much due to the connectivity and interdependency between the two extremes. Although, several employees at Polarbröd concluded that value often is more difficult to assess compared to risk, and that the routines for assessing value is less extensive. This is coherent with the research of Bowman and Ambrosini (2000). For the value assessment, a large focus is put on the market (external) perspective since Polarbröd tend to consider the financial potential in their NPDs as the most important factor. Thereby, it is fair to state that the sales department conduct thorough analyses on the possibility of selling the product, with estimation of price, competition, and volume. In similarity to the risk assessment, value can also be considered from a financial and strategic perspective. The financial perspective represents potential sales volume, but strategic value is different. Polarbröd operates according to their core values of three times good, and fulfilling these goals often implies creating product with more than financial value.

The way of assessing value through mapping the value creating assets is not something that is actively done at Polarbröd. Although, the core assets defined by Marr, Schiuma and Neely (2004) are all existing within Polarbröd, and the respondents took a strong RBV approach (Bowman & Ambrosini, 2000) while explaining that there are a lot of different components that create value, and that it is an interdependent field. Polarbröd's internal definitions of value, from a market perspective and production perspective, corresponds somewhat to the highlighted definitions of financial value, customer value, internal value and learning and growth value (Marr, Schiuma & Neely, 2004) collectively, but not always specifically. The way of considering the value perspectives as connected is highly present and in line with Figure 3.3.

As Berk and Demarzo (2014) highlights, a heavy focus on the financial value often corresponds to a short-term value perspective and that financial valuation generally relies on heavy assumptions about the situation. This is something that Polarbröd should try to cease, due to their aim of having a mixed portfolio, including a more long-term value creation. Their focus on financial metrics is still the same as when they only conducted short-term, independent projects, which could be changed. The financial evaluation metrics that Polarbröd uses today (profitability, margin, price per kilo, price per product) are different from the metrics that Berk and Demarzo (2014) (NPV and IRR) and Day (2007) (ROA and ROI) emphasis, which is motivated by that they seek simplicity and that the financial metrics need to be easy to understand and manage. A reason for why the financial valuation methods explained by Berk and Demarzo (2014) and Day (2007) could be difficult and biased to use for NPDs at Polarbröd is due to the many assumptions that need to be made regarding different projects. At Polarbröd, there are significant differences among the projects and thereby it could become highly complex, and even impossible, to manage all assumptions that for example NPV and IRR requires. Furthermore, we see that adjusting the whole

organisation of Polarbröd to apply other metrics would be an unnecessary alteration that might have severe negative effects on the attitude towards change.

For addressing the aspects of value more thoroughly, and develop their current system for it, Polarbröd could apply a screening integrated into the checklist of value assessment, that relatively estimates the potential of each specific project (Day, 2007). This screening can change the focus from short-term financial valuation to a more comprehensive view of value, which is needed in the competitive market that Polarbröd operates in. The screening can also constitute a useful, overall framework for detecting value, something that could be applied on all types of projects. The perspective of learning and growth value might be of special interest for Polarbröd, since they often try to create products with strategic rather than profit generating potential.

On a more detailed level, by applying a value classification similar to the one highlighted in this study, Polarbröd would be able to estimating value in more extensive way than they currently do. For assessing financial value they could complement their existing techniques with a relative estimation of profitability for an acceptable level of risk, and focus more on the risk level itself, to be able to see the financial potential. For estimating the customer value, which is one of the main targets of Polarbröd today, they could investigate the customer satisfaction and customer loyalty more thoroughly by communicating more with their consumers and customers. The internal value could beneficially be assessed through investigating the satisfaction of the market, to detect the product potential and focus more on assessing what characteristics that are needed to achieve a competitive advantage. The perspective of learning and growth value constitute the most significant improvement area, where Polarbröd need to actively find strategic alignment between projects and the overall strategy, find a supportive situation from the management side, detect superior resources, apply an appropriate management for the projects and use models to assess the situation. These improvement parameters constitute areas that Polarbröd do not target and actively assess at the moment but need to take into consideration to be able to improve their value assessment. Nevertheless, there is also improvement potential of the parameters that they do target and this could be done by assessing them more thoroughly.

## **5.4 The Overall Development at Polarbröd**

While comparing the past structure of the NPD at Polarbröd with the current structure, it is evident that they have made significant changes in their way of operating. The most significant alteration concerns how the company assess and evaluate their new projects, which has been changed through the implementation of portfolio management. This has given them a more holistic and transparent view of their projects. The past structure for developing new products at Polarbröd were focused around independent projects, managed through the PPS-model. The current structure involves models that provide better visualisation of the whole portfolios of projects, creating a better understanding of the complete situation for everyone involved. The portfolio models have also created enhanced communication and integration between the different departments and bakeries, which the

past structure failed to do. Furthermore, the portfolio management approach has made the decisions that are made in the process to be based on evidence rather than opinions that had a critical impact in the past structure. The portfolio management models have, by their informative character, also decreased the amount of decisions based on biased power of the management, which results in decisions made in the interests of Polarbröd rather than individual interests that often happened in the past. Thereby, the efficiency of developing products has been enhanced with the approach of portfolio management.

Another important difference between the past structure and current structure of developing products is that Polarbröd, thanks to the holistic and transparent view of the projects in the applied portfolio models, is now able to conduct both short-term and long-term projects. In comparison to the past structure where projects were developed to reach short-term financial goals, the portfolio models creates a comprehensive view of the portfolio, making it possible to link them to the business strategy and the company goals. The portfolio models also indicate the risk and value level of the whole portfolio, making it easier to assess these parameters from a holistic perspective. As Polarbröd in their former development process evaluated the projects independently, they did not assess risk and value based on the interdependencies between different projects, nor between the internal ability to handle these aspects. This is partly solved through the portfolio management approach, which gives a more holistic and solid foundation for the assessment of the projects. However, we still consider this as an improvement aspect.

Even though the current structure of developing new products at Polarbröd is not more rapid than the past structure of managing the operations, it is evident that the processes have become more formal and efficient. The reorganisation has created clearer responsibilities and a more systematic approach of prioritizing and allocating the limited resources of the company.

## **5.5 Improvement Potential and Improvement Strategies**

The overall improvement aspects within Polarbröd lies within learning to prioritize, learning from past experiences, integrating the bakeries, trying new concepts within new markets, the internal knowledge and skills of baking, but also to visualize and simplify the product portfolio and its characteristics. Applying a portfolio management approach has resulted in many improvements of these aspects for Polarbröd, but this requests continuous work to become even more effective.

More specifically, to keep some flexibility in the development process the projects can be divided according to innovation level. This is also necessary for keeping responsiveness in the development processes, to be able to be competitive in the marketplace. The rapidness of the decision-making process is an improvement area, which beneficially could become more effective.

For the risk and value assessment a more formalized checklist would be beneficial to add to Polarbröd's routines. This would help them in unifying the goals with their product development, as well as increasing the transparency between the involved employees. This is also something that could be adjusted to the different categories of the project's innovation levels and keep track of what they actually assess. Furthermore, the risk assessment could be done more effectively if the current way was complemented by another model that combine the different risk perspectives, to detect the expected return and chances for successful launch (Davis, 2002). To give a more comprehensive understanding of the risk, a slight alteration to the assessment definition would be beneficial. By letting it be market risk, technical risk, and user risk, Polarbröd would be able to detect more risk components and also get a better overview of the different risks. The value assessment could benefit from a slight extension of the definition. To define value as consisting of a financial value, customer value, internal value and learning and growth value instead of only using the perspectives of market and production would enhance this, in combination with mapping the assets that creates the value, to easily visualize it. Complementing their current value assessment with a screening (Day, 2007) would enhance their relative estimation of value and make it easier to find the specific components of importance. This would also help in shifting the focus from short-term projects to more long-term projects, which could enhance the learning and growth value for Polarbröd that implies a significant importance. Beneficially, this could be integrated into the checklist of the risk and value assessment.

## **5.6 Concluding Remarks**

Based on the discussed assessment parameters for decision-making regarding risk and value presented by the highlighted research and parameters assessed at Polarbröd in combination with the improvement aspects, Table 5.3 have been constructed. The table provides a customized solution for how Polarbröd more effectively and comprehensively can assess risk and value in their product portfolio to support their decision-making.

Type of Risk	Criteria	Practical Assessment Theory	Practical Assessment Polarbröd	Coherence	Addition
<b>Market Risk</b> (Davis, 2002; Day, 2007)	Value Chain & Market Assessment	- Sales force		<input type="checkbox"/>	- Polfärskt Bröd/ External agents
		- Distribution channels		<input type="checkbox"/>	- Polfärskt Bröd/External agents - Suppliers
		- Manufacturing capabilities	- Product Characteristics - Ingredients (Price, Availability, Handling) - Test-baking - Facility Investments - Production Capacity - Production Changes - Location (which Bakery)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		- Customer support		<input type="checkbox"/>	- Availability & Communication
		- Presence in the market	- Competitors - Market Characteristics & Size - Timing (launch) - Sales (Profitability, Margin, Price per Kilo, Price per Product) - General Food Trends	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>Technical Risk</b> (Davis, 2007)	Innovation & Capability Assessment	- Technology and current use of it	- Baking Technique - Product Characteristics - Ingredients (Price, Availability, Handling)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

		- Capabilities of development team		<input type="checkbox"/>	- Baking Technique and knowledge
		- Capabilities of supporting program management		<input type="checkbox"/>	- Baking Technique and knowledge - Decision-making support
<b>User Risk</b> (Davis, 2002; Day, 2007)	Interaction & Specification Assessment Criteria	- Design and performance specification are known	- Consumer Trends - Demand - Purchasing Power - Cannibalization - Timing (launch)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		- Attributes of user interaction with the product are known	- Consumer Trends - Demand - Purchasing Power - Cannibalization - Timing (launch)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>Financial Value</b> (Day, 2007)	Profitability at a Specified Risk Level	- Calculate ROA, ROI, profit margin	- Margin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	- Product Characteristics (Financial)
		- Relative estimate of profitability on an acceptable level of risk		<input type="checkbox"/>	- Screening/ Asking Questions
		- Forecasted returns	- Sales (Profitability, Price per Kilo, Price per Product)	<input type="checkbox"/>	
		- Risk level	- Facility Investments	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	- Relative estimate of risk
<b>Customer Value</b> (Day, 2007; Solomon, 2015)	Market Potential	- Need/ desire for the product	- Trends (Consumer & General Food Trends) - Demand - Timing (Launch)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		- Willingness to buy	- Purchasing Power - Demand	<input type="checkbox"/> <input type="checkbox"/>	



		- Size of the market	- Market Characteristics & Size	<input type="checkbox"/>	
		- Customer satisfaction		<input type="checkbox"/>	- Nilsen Data - Customer Evaluation / Feedback
		- Customer loyalty	- Cannibalization	<input type="checkbox"/>	- Nilsen Data - Customer Evaluation / Feedback
		- Brand awareness		<input type="checkbox"/>	- Nilsen Data - Customer Evaluation / Feedback
<b>Internal Value</b> (Day, 2007)	Product Potential	- Clear product concept for external and internal purposes	- Product Characteristics (Strategic & Financial)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	- Specify
		- Possible to manufacture	- Ingredients (Price, Availability, Handling) - Test-baking - Production Capacity - Production Changes - Location (which bakery) - Baking Technique	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		- Satisfaction of the market	- Market Characteristics & Size - Purchasing Power - Trends - Sales	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>Internal Value</b> (Day, 2007)	Product Competitiveness	- (Sustained) competitive advantage		<input type="checkbox"/>	- Differentiate towards competitors: culture, tradition
		- Competitors reactions	- Competing Products: Sales & Prices	<input type="checkbox"/>	

<b>Learning &amp; Growth Value</b> (Day, 2007)	Strategic Sense to Launch	- Match with overall growth strategy		<input type="checkbox"/>	- Portfolio Management - Company Culture
		- Support by the top management		<input type="checkbox"/>	- Bread Meetings - Decision-making
<b>Learning &amp; Growth Value</b> (Day, 2007; Oh, Yang & Lee, 2012)	Company Competitiveness	- Superior resources		<input type="checkbox"/>	- Human Resources (ideas, culture)
		- Appropriate management		<input type="checkbox"/>	- Management team and project team
		- Ability to respond to the market		<input type="checkbox"/>	- Trends (Consumer & General Food Trends) - Communication, Understanding, Visualization of NPD
		- Models: bubble diagrams, portfolio maps, strategic buckets		<input type="checkbox"/>	- Risk Figure (more?)

**Table 5.3** Recommended Risk and Value Assessment at Polarbröd

## **6. Conclusion**

*This chapter summarize and discuss our conclusions of the study and answer our stated research questions. We provide recommendations for Polarbröd, which are summarized in Table 5.3. Suggestions for further research are also presented.*

### **6.1 Answering the Research Question**

This research has been considered in the context of Polarbröd, one of the largest manufacturers of bread in Sweden, with the aim of providing recommendations for how the company can enhance their future portfolio decisions. Throughout the study we have identified relevant theories in the field of portfolio management, decision-making within portfolio management and how the parameters of risk and value potential of products can be assessed in this specific context. The theoretical findings have been compared with our empirical findings of how Polarbröd manages their related processes. By this extensive comparison between the empirical findings and the literature review we have been able to conclude and fulfil the aim of interest by providing customized recommendations for how Polarbröd can improve their portfolio decisions. Our answer is summarized in Table 5.3 and provides a general checklist for aspects of risk and value assessment that the company can consider in order to enhance their future portfolio decisions in NPD. This table is constructed while considering the history and development of Polarbröd's product development and portfolio management, and provides recommendations for how Polarbröd can extend their current way of assessing risk and value, and make more holistic and solid decisions about these parameters. We also find that Figure 3.2 of different product categories and their relative risk can enhance visualization in the risk assessment of the company, contributing with better understanding among the employees involved in the processes of product development, ultimately resulting in improved portfolio decisions.

### **6.2 Recommendations for Polarbröd**

In order to improve the product development at Polarbröd even further, we consider as mentioned their current portfolio management methods beneficially complemented by a more formalized checklist for risk and value parameters to practically assess, as well as a model for visualizing the different types of risk and how they vary between different product categories. The checklist is presented in Table 5.3, where the right column represents recommended additions for Polarbröd to make in their risk and value assessment. The list provides a comprehensive overview of the risk and value assessment and gives a solid foundation for making more efficient portfolio decisions, as well as it will create a collective understanding of what parameters that are necessary to assess. The extensive character of the checklist will provide a better opportunity to address risk and value for enhancing long-term projects, simultaneously as it can be adjusted to the specific conditions of each project's size and innovation level.

In this framework, we do especially consider it beneficial for Polarbröd to put focus on the value assessment of their products, which currently is in urgent need of being complemented and evaluated from a more structured and holistic perspective. We consider the current financial value assessment through the metrics beneficial to keep rather than revising and applying other metrics such as NPV, IRR, ROA and ROI, due to their complexity and that these other metrics rely on strong assumptions of reality. The customer value could be assessed through more thorough analyses of the customers, with a special focus on customer and market satisfaction and customer loyalty. The internal value assessment needs to be complemented by detecting competitive advantages and by clearly stating product concepts. Although, the most significant improvement potential lay within the assessment of learning and growth value, where a strong focus should be put on aligning the development projects to the overall growth strategy, finding superior resources, and appropriate and supportive management. Our recommendation for Polarbröd is to initiate a restructuring effort for the value assessment as soon as possible, since this parameter incorporates the most significant improvement potential. As a first step, an redefinition of the term value need to be made, before actually implementing any changes, and here we consider communication and transparency to be crucial components for engaging the whole organization.

Table 5.3 also show how the risk assessment could be improved. We consider Polarbröd's risk assessment to be well developed already, but it could be slightly adjusted in their favour. In order to create a better overview over the different risks, we consider it necessary for Polarbröd to revise their current definition of the risk categories market risk and production risk, and instead use the theoretical definitions of market risk, technical risk and user risk. For the aspect of market risk, the assessment could beneficially be extended to include the sales forces, the distribution channels and the customer support. The technical risk could include the parameters of the development team and supporting program management, with expertise in baking and management, to complement the existing assessment. We consider the user risk to be fairly comprehensive, but the parameters can always be complemented and reconsidered. Furthermore, Figure 3.2 will help Polarbröd to visualize the risks of different products and thereby create further understanding, transparency, and ease the complexity of the product development field for them. The model itself illustrates the different types of risk to assess in relation to each other, in the different product categories. The implementation time for extending the risk assessment is to be seen on a short-term basis, as the current risk assessment is comprehensive. As a first step, a discussion of applying another definition of risk needs to be held.

In our opinion, this is a reasonable start of improving the product development efforts at Polarbröd, which will be in line with their own goals and strategies. Instead of acting on feelings and individual opinions, this framework will provide evidence from the existing research within the field, which can complement the decision-making process for risk and value at Polarbröd. We consider the employees of Polarbröd as a central contributor to the success of the company, and it would by no means be beneficial to erase their impact on the product development. The individuals possess a lot of competence and experience but need a more clear structure and useful tools to handle the specific situation within the company.

Therefore, focusing these individual efforts by formalizing the routines and making it more transparent and understandable, would benefit all parties and help Polarbröd in the process of learning from their past experiences.

### **6.3 Suggestions for Further Research**

One part of the purpose with this study was to complement the existing research within the field of NPD decision-making in portfolio management. Based on our findings, we have identified some suggestions for further research within the field.

We see that there is a need for future research to cover the practical aspects within the field of best practices, or at least practices, for how companies today manage their product portfolios. We find it valuable to complement the existing research with case studies, as for this one, to provide practical examples of the practices that are used and hopefully address the effect on company performance. We would like to see how these practices affect the decision-making process and its effect on performance, from both a short-term and long-term perspective.

Furthermore, we would find it valuable to see how strategic models are used, why they are used, and how they could be adjusted to specific situations and contexts, with regard to portfolio management. Especially interesting would be to see a comparable case study to this one, reflecting the Swedish bread industry from another actor and perspective as the current research is lacking on this aspect.

Future research may also examine how the marketplace within the Swedish (or international) bread industry will develop in terms of the changing competitiveness among the different actors. This is connected to the delimitations of this study, but we find this research important to conduct in order to detect what conditions, in terms of NPD and portfolio management, that will be important for companies within the industry in order to survive and prosper. The severe competition of today requests more research within this specific field. In addition, this research would also provide evidence on what focus that would be necessary in future decision-making for developing relevant products from a risk and a value perspective.

## References

- Anderson, J. & Woolley, M. (2002) Towards Strategic Sourcing: The Unilever Experience. *Business Strategy Review*, vol.13, issue 2, p. 65–73.
- Andrews, K.R. (1971) *The Concept of Corporate Strategy*. Homewood, IL: Dow Jones-Irwin.
- Antikarov, V. & Copeland, T. (2001) *Real Options: A Practitioner's Guide*. New York: Texere.
- Balbontin, A., Yazdani, B.B., Cooper, R. & Souder, W.E. (2000) New Product Development Practices in American and British Firms. *Technovation*, vol. 20, issue 1, p. 257-274.
- Barczak, G., Griffin, A. & Kahn K.B. (2009) Perspective: Trends and Drivers of Success in NPD Practices: Results of the 2003 PDMA Best Practices Study. *Journal of Product Innovation Management*, vol. 26, issue 1, p. 3–23.
- Beaujon, G.J., Marin, S.P. & McDonald, G.C. (2001) Balancing and Optimizing a Portfolio of R&D Projects. *Naval Research Logistics*, vol. 48, issue 1, p. 18–40.
- Becker, G.S. (1964) *Human Capital*. New York: Columbia.
- Blythman, J. (2004) *Shopped: The Shocking Power of British Supermarkets*. London: HarperCollins.
- Bonanno, A., Busch, L., Friedland, W. & Mingione, E. (1994) *From Columbus to ConAgra: The Globalization of Agricultural and Food*. Lawrence, KA: University Press of Kansas.
- Bowman, C. & Ambrosini, V. (2000) Value Creation versus Value Capture: Towards a Coherent Definition of Value in Strategy. *British Journal of Management*, vol. 11, issue 1, p. 1-15.
- Brenner, M.S. (1994) Practical R&D project prioritization. *Research & Technology Management*, vol. 37, issue 5, p. 38–42.
- Brigham, E.F. & Erhardt, M.C. (2002) *Financial Management, Theory and Practice*. Cincinnati: South-Western College Publication.
- Bryman, A. & Bell, E. (2015) *Business Research Methods*. Oxford: Oxford University Press.
- Camp, R.C. (1998) Best Practice Benchmarking: the Path to Excellence. *CMA Magazine*, vol. 26, issue 6, p. 10–15.
- Chun, Y.H. (1994) Sequential Decisions Under Uncertainty in the R&D Project Selection Problem. *IEEE Transactions on Engineering Management*, vol. 40, issue 1, p. 404–413.
- Christiansen, J.K. & Varnes, C. (2008) From models to practice: decision-making at portfolio meetings, *International Journal of Quality & Reliability Management*, vol. 25, issue. 1, p. 87-101.

- Coffey, A. & Atkinson, P. (1996) *Making sense of qualitative data*. Thousands Oaks, CA: Sage publications.
- Coldrick, S., Longhurst, P., Ivey, P. & Hannis, J. (2005) An R&D Options Selection Model for Investment Decisions. *Technovation*, vol. 25, issue 3, p. 185–193.
- Cooper, R.G. (2005) Your NPD Portfolio may be Harmful to Your Business's Health. *PDMA Visions*, April 2005.
- Cooper, R.G. & Kleinschmidt, E. (1996) Winning Businesses in Product Development: the Critical Success Factors. *Research Technology Management*, vol. 50, issue 3, p. 52-66.
- Cooper, R.G., Edgett, S.J. & Kleinschmidt, E.J. (1998) Best Practices for Managing R&D Portfolios. *Research-Technology Management*, vol. 41, issue 4, p. 20–33.
- Cooper, R.G., Edgett, S.J. & Kleinschmidt, E.J. (1998) *Portfolio Management for New Products*. Reading, MA: Addison-Wesley.
- Cooper, R.G., Edgett, S.J. & Kleinschmidt, E.J. (2001) *Portfolio Management for New Products*. Cambridge, MA: Perseus.
- Cooper, R.G., Edgett, S. & Kleinschmidt, E. (2001) Portfolio Management for New Product Development: Results of an Industry Practices Study. *R&D Management*, vol. 31, issue 4, p. 361-380.
- Cooper, R., Edgett, S. & Kleinschmidt, E. (2004) Benchmarking Best NPD Practices II. *Research Technology Management*, vol. 47, issue 3, p. 50-59.
- Costa, A.I.A. & Jongen, W.M.F. (2006) New Insights into Consumer-Led Food Product Development. *Trends in Food Science & Technology*, vol. 17, issue 8, p. 457-465.
- Davis, C.R. (2002) Calculated Risk: A Framework for Evaluating Product Development. *MIT Sloan Management Review*, vol. 43, issue 4, p. 71-77.
- Davis, J., Fusfield, A., Scriven, E. & Tritle, G. (2001) Determining a Project's Probability of Success. *Research-Technology Management*, vol. 44, issue 3, p. 51–57.
- Day, G. S. (2007) Is It Real? Can We Win? Is It Worth Doing? Managing Risk and Reward in an Innovation Portfolio. *Harvard Business Review*, vol. 85, issue 12, p. 110-120.
- Dicken, P. (2011) *Global Shift: Mapping the Changing Contours of the World Economy*. New York: Guilford.
- Dickinson, M.W., Thornton, A.C. & Graves, S. (2000) Technology Portfolio Management: Optimizing Interdependent Projects Over Multiple Time Periods. *IEEE Transactions on Engineering Management*, vol. 48, issue 4, p. 518–527.
- Edvinsson, L. (1997) Developing Intellectual Capital at Skandia. *Long Range Planning*, vol. 30, issue 3, p. 320-331.
- Erhun, F., Gonçalves, P. & Hopman, J. (2007) The Art of Managing New Product Transitions. *MIT Sloan Management Review*, vol. 48, issue 3, p. 73-80.

- Graves, S.B., Ringuest, J.L. & Case, R.H. (2000) Formulating Optimal RD Portfolios. *Research-Technology Management*, vol. 43, issue. 3, p. 47-51.
- Griffin, A. (1997), PDMA Research on New Product Development Practices: Updating Trends and Benchmarking Best Practices. *Journal of Product Innovation Management*, vol. 14, issue. 6, p. 429-458.
- Griffin, A., Lauche, K., Hultink, E.J. & Kester, L. (2011) Exploring Portfolio Decision-Making Processes. *Journal of Product Innovation Management*, vol. 28, issue. 5, p. 641-661.
- Grindley, P.C. & Teece, D.J. (1997) Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics. *California Management Review*, vol. 39, issue 2, p. 8-41.
- Hagel III, J., Brown, S. J. & Davison, L. (2010) The Best Way to Measure Company Performance. *Harvard Business Review*, Digital article.  
<https://hbr.org/2010/03/the-best-way-to-measure-compan> (Accessed 2016-04-26)
- Heidenberger, K. & Stummer, C. (1999) Research and Development Project Selection and Resource Allocation – a Review of Quantitative Modelling Approaches. *International Journal of Management Review*, vol. 1, issue 1, p. 197–224.
- Hingley, M. & Hollingsworth, A. (2003) Competitiveness and Power Relationships: Where Now for the UK Food Supply Chain? Conference Proceedings of the 19th Annual IMP Conference Lugano, Switzerland.
- Hingley, M., & Lindgreen, M. (2004) Supplier – Retailer Relationships in the UK Fresh Produce Supply Chain. Conference Proceedings of the 20th Annual IMP Conference Copenhagen, Denmark.
- Hunt, R.A. & Killen, C.P. (2008) Best practice project portfolio management. *International Journal of Quality & Reliability Management*, vol. 25, issue 1.
- Itami, H. (1987) *Mobilizing Invisible Assets*. Cambridge, MA: Harvard University Press.
- Kaplan, R. S. & Norton D.P. (1992) The Balanced Scorecard: Measures that Drive Performance. *Harvard Business Review*, vol. 70, issue. 1, p. 71–79.
- Kaplan, R.S. & Norton, D.P. (2000) Having Trouble with Your Strategy? Then Map it. *Harvard Business Review*, vol. 78, issue 5, p. 167-176.
- Kester, L., Hultink, E.J. & Lauche, K. (2009) Portfolio Decision-Making Genres: A Case Study. *Journal of Engineering and Technology Management*, vol. 26, issue 1, p. 327–341.
- Khurana, A. & Rosenthal, S.R. (1997) Integrating the Fuzzy Front End of New Product Development. *Sloan Management Review*, vol. 38, issue. 2, p. 103.
- Killen, C.P., Hunt, R.A. & Kleinschmidt, E.J. (2007) Managing the New Product Development Project Portfolio: a Review of the Literature and Empirical Evidence. Proceedings of PICMET Conference 2007, Portland, OR.



Kiple, K.F. (2007) *A Movable Feast: Ten Millennia of Food Globalization*. New York: Cambridge University Press.

Lee, S., Kang, S., Park, P. & Park, Y. (2008) Applying Technology Road Selection and Planning. *International Journal of Quality & Reliability Management*, vol. 25, issue 1, p. 39-51.

-Maps in Proj

Loch, C. (2000) Tailoring Product Development to Strategy: the Case of a European Technology Manufacturer. *European Management Journal*, vol. 18, issue 3, p. 246–58.

MacMillan, I.C. & McGrath, R.G. (2002) Crafting R&D Project Portfolios. *Research-Technology Management*, vol. 45, issue 5, p. 48–59.

Marr, B., Schiuma, G. & Neely, A. (2004) The Dynamics of Value Creation: Mapping Your Intellectual Performance Drivers. *Journal of Intellectual Capital*, vol. 5, issue 2, p. 312-325.

Martin, M.J.C. (1994) *Managing Innovation and Entrepreneurship in Technology-Based Firms*. New York: John Wiley & Sons.

Martino, J.P. (1995) *R&D Project Selection*. New York: John Wiley & Sons.

McDonough, E.F. & Spital, F.C. (2003) Managing project portfolios. *Research Technology Management*, vol. 46, issue 3, p. 40.

Nelson, R.R. & Winter, S.G. (1982) *An Evolutionary Theory of Economic Change*. Cambridge, MA: Harvard University Press.

Oh, J., Yang, J. & Lee, S. (2012) Managing Uncertainty to Improve Decision-Making in NPD Portfolio Management with a Fuzzy Expert System. *Expert Systems with Applications*, vol. 39, issue 10, p. 9868-9885.

Olsson, R. (2008) Risk Management in a Multi-project Environment: An Approach to Manage Portfolio Risks. *International Journal of Quality & Reliability Management*, vol. 25, issue. 1, p. 60-71.

Padgett, D. (2008) *Qualitative methods in social work research*. New York: Sage publications.

Penrose, E.T. (1959) *The Theory of the Growth of the Firm*. New York: John Wiley & Sons.

Perlitz, M., Peske, T. & Schrank, R. (1999) Real Options Valuation: New Frontier in R&D Project Evaluation. *R&D Management*, vol. 29, issue 3, p. 255–269.

Phaal, R., Farrukh, C.J.P. & Probert, D.R. (2006) Technology management tools: concept, development and application, *Technovation*, vol. 26, issue 3, p. 336–344.

Polarbröd (2016) Om Polarbröd <http://www.polarbrod.se/om-polarbrod/> (Accessed 2016-03-09)

Project Management Institute (2008) *The Standard for Portfolio Management*. Newtown Square, PA: Project Management Institute.

- Razgaitis, R. (2003) *Dealmaking Using Real Options and Monte-Carlo Analysis*. New York: John Wiley & Sons.
- Ringuest, J.L., Graves, S.B. & Case, R.H. (1999) Formulating RD Portfolios that Account for Risk. *Research-Technology Management*, vol. 42, issue. 6, p. 40-43.
- Roberts, P. (2008) *The End of Food: The Coming Crisis in the World Food Industry*. London: Bloomsbury.
- Roos, G. & Roos, J. (1997) Measuring Your Company's Intellectual Performance. *Long Range Planning*, vol. 30, issue 3, p. 413-426.
- Roussel, P., Saad, K.N. & Erickson, T.J. (1991) *Third Generation R&D, Managing the Link to Corporate Strategy*. Boston: Harvard Business School Press.
- Rudolph, M. (1995) The Food Production Development Process. *British Food Journal*, vol. 97, issue 3, p. 3-11.
- Schultz, T.W. (1981) *Investing in People: The Economics of Population Quality*. Berkeley, CA: University of California Press.
- Szwejczewski, M. & Mitchell, R. (2008) Risk Measurement and Management During New Product Development: an Exploratory Study. *International Journal Risk Assessment and Management*, vol. 9, issue 3, p. 277-287.
- Solomon, M. R. (2015) *Consumer Behaviour: Buying, Having, and Being*. Harlow: Pearson Education.
- Souder, W.E. & Mandakovic, T. (1986) R&D Project Selection Models. *Research Management*, vol. 29, issue 4, p. 36-42.
- TietoEnator AB (2008) Praktisk ProjektStyrning, PPS. Kista
- Traill, B. & Grunert, K. G. (1997) *Product and Process Innovation in the Food Industry*. New York: Springer.
- Wang, J. & Hwang, W.L. (2007) A Fuzzy Set Approach for R&D Portfolio Selection Using a Real Options Valuation Model. *Omega*, vol. 35, issue 3, p. 247-257.
- Ward, N. & Almås, R. (1997) Explaining Change in the International Agro-food System. *Review of International Political Economy*, vol. 4, issue 4, p. 611-629.
- Watts, M. J. & Goodman, D. (1997) *Globalizing Food: Agrarian Questions and Global Restructuring*. London: Routledge.
- Weston, J. F. & Chiu, S. (1996). Growth Strategies in the Food Industry. *Business Economics*, vol. 31, issue 1, p. 21.
- Wilkinson, J. (2002) The Final Foods Industry and the Changing Face of the Global Agro-Food System. *Sociologia Ruralis*, vol. 42, issue. 4, p. 329-346.

Williamson, O. (1975) *Markets and Hierarchies*. New York: Free Press.

Yin, R.K. (2011) *Applications of Case Study Research*. Thousand Oaks, CA. SAGE Publications.

## Appendix 1 - Interview Guide

- Please tell us a little bit about yourself and your role and tasks in the process of developing new products

### 2. General Questions

#### 2.1 Portfolio Management

- Do you have a formal process to ensure successful and efficient product portfolios?
- Do you have a clear strategy for portfolio management at Polarbröd?
- What does your product portfolio look like? Do you apply any portfolio management techniques in order to find the right balance and mix of projects in the portfolio?
- Why did you choose to embrace a portfolio management approach, and more specifically why did you choose to use bubble diagrams and the specific model that you currently have? What are the benefits of these models for Polarbröd? What is inadequate? How does the models help you to manage your portfolios?
- Do you find portfolio management to be an important aspect to handle effectively for Polarbröd? Why? Have you detected any difference in performance of Polarbröd since you first applied a portfolio approach?
- Do you consider a portfolio approach appropriate and helpful in assessing risk and value potential of different projects? Why? How?
- What is most important or critical, risk or value assessment? Motivate and explain where Polarbröd's focus is.

#### 2.2 Decision-Making

- Who makes the decisions regarding what products to focus on, how to prioritize between products, how to allocate resources? On what basis are these decisions made?
- How do you make portfolio decisions regarding new projects? Who is involved in this?
- Do you emphasise transparency of information throughout the company? How do you ensure this?

#### 2.3 Risk

- What are the major risk components that you are currently assessing in the development process? To what extent do you find these risks sufficient? Are there any risks that you find are missing in the assessment-process, are there any risks that you should include more than those that you are currently assessing? Different types of risks, characteristics of them, time perspective, type of project? How do you mitigate them?
- How do you handle uncertainties in the development process?
- Do you prefer to conduct large, risky projects or smaller, safer ones? How do you balance your portfolio based on this reasoning?

- How do you consider and assess risk in the development process? Do you apply any models/ frameworks (do you have a uniformed way of handling risk for different projects)? Do you assess risk in absolute terms or relative terms? What is most beneficial and how is it beneficial?
- Is managing risk necessary for developing new, successful products? How? Why? To what extent? What can be possible reasons?

## **2.4 Value**

- What do you consider as major value components in the development process? Different types of value, characteristics of them, how do you enhance them?
- How do you assess value in the development process? Do you apply any models/ frameworks (do you have a uniformed way of handling value for different projects)? Do you assess value in absolute terms or relative terms? What is most beneficial and how is it beneficial? Do you consider value from a short or long-term perspective? What effects do you consider the time perspective to have?
- Is managing value necessary for developing new, successful products? How? Why? To what extent?

## **3. Specific questions for the different projects (for present projects answer from a general perspective)**

### **3.1 Products to Analyse**

1. Product A
2. Product B
3. Product C
4. Product D
5. Product E
6. Product F
7. Product G

- Describe the project and its characteristics. What initiatives were taken to start the project? Major challenges and opportunities that you encountered?
- How have the decisions been made regarding the specific project? How has the decision-making process looked like?

### **3.2 Risk**

- Major risks/ uncertainties in this project? Types?
- How did you detect them?
- How did you assess them? Financial? Matrixes? Scoring methods?
- How did you include these risks in your decision-making process of the product?
- More specifically: what risk components do you assess/ what criteria do you have for each project?

### **3.3 Value**

- How did you consider the value potential of this project? Types of value?
- How did you assess them? Financial models? Relative terms? Dependent on project type or time horizon?
- How did you include the value components in your decision-making process of the product?
- More specifically: what value components do you assess/ what criteria do you have for each project?

### **3.4 Portfolio Management**

- How did the portfolio/ model help you assessing the risk and value of the project?
- What would have been different if you did not have the portfolio mind-set in this case?

### **4. Future Projects and Improvement Potential**

- What do you consider to be the major risk and value components necessary to assess in the development process of new products?
- What have been the benefits of your past approach to product development and detecting risk and value potential of the different projects? What has been inadequate?
- Where do you see most potential to improve the current product development process and its portfolio?
- How do you integrate past learning's in your future decision-making regarding product development and risk and value assessment?