



PRODUCT PORTFOLIO MANAGEMENT - CURRENT CHALLENGES AND PRECONDITIONS

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ABSTRACT

Purpose: *The main objective of this study is to clarify the current challenges relating to Product Portfolio Management (PPM). Also, any preconditions for active PPM in terms of concepts, processes, tools, KPIs and governance models are analyzed.*

Design/methodology/approach: *Current state analysis of product portfolio management practices are based on both, a thorough literature review and several case companies. Case companies represent many business areas such as HW, SW, services and even combinations of them, solution providers.*

Findings: *The role of PPM is not to be a follower of activities caused by customers, product development, sales, deliver and care organizations, and processes. The primary role of PPM should be active management of current product portfolio, over product life cycle, instead of merely focusing on new product development. Product portfolio management as a concept and process is not that well understood and in place like other business processes.*

Research limitations: *The limitations of this study include analyzing a limited number of companies. Also, the experience of the analyzed companies varies from only few years to a relatively long history.*

Practical implications: *The implications of this study include the potential preconditions of clarifying the role of product portfolio management. The findings can aid business managers in understanding the PPM as an entity that has a role in managing products and portfolios based on strategic and financial targets over product lifecycles.*

Originality/value: *This study approaches PPM from a more comprehensive viewpoint than the traditional NPD focused PPM that is mainly covered by the existing literature. A company's future portfolio is seen as a sum of the existing product portfolio and the products created via NPD. Existing product portfolio is also expanded by possible products introduced by joint ventures. This article questions whether PPM ought to be considered equally as a business process, similarly as product, sales, delivery and care processes.*



Key words Active product portfolio management, Product Portfolio, Product management, Strategic Management and Key Performance Indicators (KPIs)

Paper type Research Paper

INTRODUCTION

New products are seen vital for securing a company's competitive position in the market (e.g. Balachandra et al., 1997; Poolton and Barclay, 1998; Lynn et al., 1999), while development of new products is strongly driven by various customer requirements. However, there are also several other drivers that initiate product development (e.g. Majava et al., 2012). Aside new product development, also existing products are upgraded frequently to achieve cost reductions and improve product performance (Hänninen et al., 2012). Today, also company mergers and acquisitions are meaningful ways to enter new markets and widen a company's product portfolio without conducting new product development. This kind of environment leads easily to widening product portfolios as has occurred in several industries during the recent decades. (e.g. den Hartog, 2012).

The common belief is that a diverse product portfolio will have a positive effect on a company's sales volumes. A wide product offering is seen to allow reaching many customer segments and a larger market share. A high product variety is thought to stimulate sales by segmenting customers and attracting variety-seeking shoppers. (Wan et al., 2012). This coin also has its other side that is often ignored in the discussion. In fact, internal product variety and complexity usually reduce sales per product variant. (Cooper and Griffiths, 1994; Randall and Ulrich, 2001; Thonemann and Bradley; 2002; Pil and Holweg, 2004; Wan et al., 2012). Product variety is often justified by fulfilling customers' requirements. However, too wide product range can lead to mass confusion by the customers, thus weakening sales (e.g. Jiao et al. 2007, Wan et al. 2012). One example of the positive effects of reducing this type of mass confusion is Procter and Gamble increasing its sales by 10 % by reducing the number of versions of its Head and Shoulders shampoo from 26 to 15 (Wan et al. 2012).

Product variety has emerged as a source of competitive differentiation responding to the requests for increasingly customized products and services, when the variety is even desired (Hayes et al., 2005). One aspect that is often ignored in the literature is managing the product plans, products under development, and products in the market over the product life cycles, from an end-to-end viewpoint. Today, companies are often too focused on managing single products instead of managing the entire product range. Consequently, companies could benefit from considering several product families rather than separately optimizing each product. (Salvador et al., 2002). This research paper aims to analyze the current main challenges of product portfolio management faced by companies. This article analyses the PPM practices of selected case companies. Process management methodology is used as a base frame for the used interview questionnaire. Challenges identified based on the interviews are classified to clarify the most common and significant ones. Product Portfolio Management, as any other processes, requires availability of certain building blocks as preconditions. This paper also aims to clarify these



preconditions to further improve product portfolio management practices over the product life cycle.

The above discussion can be condensed into the following research question:

RQ1. What are the challenges related to product portfolio management?

RQ2. What are the preconditions for product portfolio management?

This study addresses the research questions by using a qualitative approach, through case company interviews and a literature review.

EARLIER RESEARCH

1 Product Portfolio Management

Portfolio management approach can be applied in various areas to manage a set of activities conducted by the same pool of resources (Vähäniitty, 2006). The main objectives of portfolio management can be defined as 1) maximizing the value of portfolio, 2) balancing the portfolio, and 3) linking the portfolio to business strategy (Cooper et al., 1997a).

In addition, portfolio management can be seen as a higher management level decision making process for managing uncertainty, dynamic opportunities, strategic goals, and interdependencies between portfolio items to obtain clear decisions based on agreed criteria (Cooper et al., 2001).

Products can be evaluated based on their strategic importance and ability to become top class products. Also, resources should be allocated to products according their business value. (Ward and Peppard, 2002).

2 Product Portfolio Management challenges

Many product portfolio related challenges have been presented in Hewlett-Packard's portfolio management and operations research (Ward et al., 2010). According Ward et al. (2010) the following challenges have been identified for offering multiple similar products: 1) increase of overall demand volatility, 2) reduced forecasting accuracy, 3) impact to revenue and cost of the product over life cycle, 3) increase in inventory-driven costs and order-cycle time, 4) increased liabilities to channel partners, 5) increased cost for operations, R&D, marketing and administration, and 6) complexity of product lines that confuses customers, sales representatives, channel partners and even driving business to competitors.

Ward et al. (2010) also present solutions to overcome these challenges. These solutions are grouped into managing product portfolio by a "complexity ROI calculator" within product creation life cycle, and managing product variations by a "revenue coverage optimization tool" after product launch.

The interests towards product portfolio management have increased due to many negative side effects of the portfolio management not being done properly. Cooper et al. (2001) have listed the



following negative aspect such as a) missing strategic criteria in project selection resulting in unimportant and low value projects and too many of them and b) deficient go/kill decisions for low value projects resulting in too many extensions, modifications, enhancements, short term projects and lack of focus.

One of the challenges of product portfolio management is the lack of consistent interest and understanding by senior management). Senior management involved in technology is seen to have the most important role in PPM, followed by senior management in general, and corporate executives. Marketing and Sales managers are seen to have the least important role as they are seen to operate at the customer front end, with a clear role in project selection and portfolio management. (Cooper et al., 2001).

One of the most significant weaknesses of existing commercial IT-solutions for PLM is poor support of product life cycle activities outside the actual product development process. Second significant gap is the integration of mechanic, electronic, software, and services components, and elements such as the full view over products. (Saaksvuori, 2011).

3 Process management approach for creation of building blocks for active product portfolio management

The “three levels” of performance: organization, process and job/performer levels can be seen as an ecosystem dimension to business performance (Rummler and Brache, 1990). According to Rummler and Brache (1990) organizations produce their outputs through cross functional work processes, organizations being only as good as their processes. Processes are performed by individuals holding various jobs. Rummler and Brache (1990) also present three “performance needs” of goals, design (structure of organization, processes and individuals,) and management based on clear KPIs. According to Rummler and Brache (1990) is the criticality of cross functional processes to the quality, productivity, cycle time, and cost of any company.

The success of improvement projects are based on project management sitting on the seat of three legs; people, process and technology. The organization strategy and goals of processes to be linked together. People to perform the tasks according processes and related performance metrics to be capable to make things on more predictive way rather than proactive. The foundation for the framework is organizational strategy and process architecture. (Jeston and Nelis, 2008).

Improvements can be done in two different ways in principle such as by breakthrough type of approach or by continuous improvement. Business Process Re-engineering (BRP) has been utilized for more radical changes. The BRB methodology includes several phases: reaffirmation of the vision, core process identification, process analysis, process re-design, blueprinting and implementation planning. (Slack et al. 2012).

According to Jeston and Nelis (2008) the foundation for Business process management consists of following building blocks: 1) process leadership, 2) process governance, 3) process

performance, 4) strategic alignment, 5) people capability, 6) project execution, and 7) technology.

The building blocks for active product portfolio management can be formed as following: a) strategy and key performance indicators, b) organization and people as governance model, c) core processes and tools including technology and information systems.

RESEARCH PROCESS

The research process is shown in Figure 1. This research is qualitative in nature. Product and product portfolio management was first studied by using the existing literature as a key source. The empirical study consists of industrial interviews.



Figure 1. Research process.

Process management theory and approach was utilized to create a comprehensive questionnaire for the empirical part of the study and to analyze whether the current practices apply process management methodologies. The viewpoints are organization, processes, target setting and key performance indicators. Also the question about data availability has been taken into analysis.

Five selected companies (Table 1) were interviewed to clarify the current practices and challenges related to product portfolio management. The interviews were recorded, extracted and transcribed to enable thorough analyses. The selected five companies represent both large/global and small/growing businesses working in different areas such as solutions, HW, SW, and Services products, or all of them simultaneously. The number interviewees are dependent on the size of the case company. In bigger companies the interview has been conducted as work shop of cross functional group of managers while in smaller companies only CEO, R&D manager or Product Management have been interviewed.

Table 1. Company characteristics

Company	Portfolio characteristics	Operational maturity	Interviewees' responsibility areas/roles	Number of interviewees
A	Small portfolio of HW products and related emerging service business managed directly by CEO	New national rival in mature business	CEO	1
B	Large portfolio of solutions, HW, SW and Services products under strategic renewal.	Experienced global innovator in mature business with strong R&D investments	PPM development manager, product data manager, F&C manager, product manager (2), Process dev manager (2)	7
C	Small innovative portfolio of SW products	Growing international presence in growth business	CEO, R&D manager	2
D	Small portfolio of HW and SW products	Experienced growing company in growing global business	R&D manager	1
D	Medium size HW product portfolio under strategic renewal	Experienced global leader in declining business, new growth and business potential via portfolio renewal	Product Management Manager	1

Based on the interview material, high-level product portfolio management challenges and requirements were identified by using inductive logic. The findings were grouped based on process management approach.



RESULTS AND ANALYSIS

Portfolio management challenges

All interviewed companies see potential for improvement in their product portfolio management. The results are presented following similar process management methodology and structure as in the interview questionnaire. Product portfolio management challenges generic to all interviewed companies are presented using the following five sub groups:

- 1) Product portfolio challenges in general
- 2) Product portfolio management challenges related to processes and tools
- 3) Product portfolio management challenges related to ownership and governance models
- 4) Product portfolio management challenges related target setting and key performance indicators (KPIs)
- 5) PPM challenges related to data availability

1 Portfolio management challenges in general

Product portfolio management is seen as a generic challenge in case companies regardless of the size, maturity and history of the company. Product portfolio management is viewed nearly non-existent, not only from processes and tools perspective, but from strategic target setting and follow up, ownership and governance model point of view. **The idea and the role of PPM as higher level analysis and decision making process for the entire product portfolio including new and existing products is not thoroughly understood.**

The entire product portfolio and sub portfolios have been not clearly defined and agreed while different groups of products, units, modules and technologies have been called as portfolios. Overall, the visibility over product portfolio as a whole is not seen to be consistent.

The size and proliferation of the product portfolio are seen as the most common challenges in case companies. In some cases, even when the company is relatively new, they have already too many products to be maintained and updated compared to their capabilities. In this type of cases the total revenue share per product decreases. Products and their technical relations to each other are seen even more complicated to maintain. Several versions of same products are simultaneously sold and produced over many years resulting in **cannibalization** within product families, and even outside them. Product cannibalization is not planned and managed consistently, resulting in negative product business cases and/or obsolete materials. Usually the management focus has been more on new products ramp ups while the removal of old products has not been given adequate attention. In an ideal situation, product ramp down activities are done in a synchronized manner with ramp ups (phase in / phase out management).

Lack of product portfolio level business case thinking is seen to exist. The focus has been more on single components, modules, units and products rather than on an entire product portfolio. **The durations of product life cycles** are seen not to be planned in original business



plans for new products. Companies have simply followed their customers' behavior and their requirements.

Product portfolio management is tightly connected to concepts and methods applied in product life cycle management and product data management. **The reporting capabilities** on portfolio, sub-portfolio and product levels are seen dependent on product data management concepts and data structures. In some cases, the required data would even be available but existing design, PDM, configurator and ERP –tools are not utilized consistently in reporting.

The clean-up and renewal of product portfolio is seen as a company level challenge that requires strong leadership from top management. Lack of clear ownership for product portfolio management and product management decreases the capabilities to manage and **communicate the change** efficiently in co-operation with main stakeholders such as R&D, Sales, Operations and Services.

The above described challenges are common for the analyzed case companies. Table 2 summarizes challenges that are more specific for the individual case companies. .

Table 2. Company specific challenges on product portfolio management in general.

- A no company specific challenges – only common challenges exist
 - B partly separated HW and SW product development road maps, fast technology and cost reduction initiatives, compatibility challenges, too short life cycles per product version to reach positive breakeven
 - C lack of visibility and understanding on customer demand, opportunities for cross selling not well utilized, connection to end user experience and their behavior exist only in narrow local area
 - D the way how product portfolio and saleable products have been structured and coded impacts the size of product portfolio and the capabilities of delivering right products
 - D no company specific challenges – only common challenges
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2 Processes and tools related challenges in PPM

Business processes such as R&D (also referred to as product process), Sales, Deliver and Services processes are seen to be described at a higher level, and even structured in more detail as sub processes in most of the case companies. The challenge is not seen to be the lack of process management theory and overall practices. **Process management concepts and descriptions have been not been implemented for the entire product portfolio management** due to lack of overall understanding product portfolio management concepts. Product decisions and activities have been done more in an ad-hoc and intuitive manner, and in bigger companies at the lower levels of business units. Due to lack of processes, product decisions are done too



quickly and without real analysis of the market demand and understanding the potential for profitable business.

Only a couple of strategic and tactical product portfolio management tools have been utilized by the case companies. For the entire product portfolio evaluation the most typical and used tool is a “product road map”, in all case companies. For the evaluation of individual product development projects the “state gate process” –approach has been used by only some of the case companies.

The above mentioned challenges are common in the case companies. There are not many specific challenges related to processes and tools due lack of product portfolio management process as such. Some more specific challenges experienced in case companies on processes and tools are summarized in table 3.

Table 3. Company specific challenges related to portfolio management processes and tools.

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- A** only one product layer modeled and managed by current ERP tools (which is the main data source), product portfolio cannot be modeled, evaluated and managed as full structure from top to down, overall main business processes have not been described yet
 - B** product portfolio and product road map presentations are created and maintained manually by Excel and PowerPoint applications even common tools such as PDM, Configurator and ERP and the data inside them could be utilized better, product portfolio revenue data is grouped by certain global invoicing codes under the structure of business lines which makes product profitability analysis difficult
 - C** overall main business processes have not been described yet
 - D** no company specific challenges – only common challenges
 - D** no company specific challenges – only common challenges
-

Many strategic and tactical tools are available for the evaluation and management of product portfolio in theory. Not many of them have been even identified and only couple of them has been utilized.

3 Portfolio ownership and governance models related challenges in PPM

The definition of ownership is seen to require more clarity as responsibilities and expected activities are not clear. The product portfolio ownership can mean both business and technical responsibilities but many other views as well.

The clarity of product portfolio ownership is seen to be dependent on consistent definitions of product portfolios, product families, applications and platforms. In many case companies there



are no written and formal product portfolio definitions, due to which neither have ownership statements been done. The wider the offered solutions and systems are, more they are seen to cross the borders of possible sub-product portfolios, resulting in more challenges on final ownership, both from sales recognition and technical viewpoints. Offered solutions and systems can consist of many HW, SW and Service products, and can be combinations of all of them.

The ownership and governance of product portfolio management differs based on the size of the company. In the biggest company there is a separate product portfolio management team organized in addition to product managers in separate business units and business lines. In the smallest company, the product portfolio ownerships has been taken by CEO. In medium sized companies the ownership is seen as very collegial and taken by the executive board, or cross functional management team.

Only in one case company there is separate product portfolio management function organized. Even though the team was named a year ago, they still have challenges in applying their role and to get visibility over the entire product portfolio. The similar group of people is currently being created by another interviewed company. This type of group can be created by grouping existing product managers together as a centralized team. In all of the other interviewed companies the ownership is taken by CEO or R&D manager. At the highest level, a group of executives form cross functional and collegial final ownership of product portfolio but even at that level the responsibilities are seen to have room for clarifications. **The overall challenge is to have dedication, time and resources for product portfolio management on needed level of organization.**

Due to lack product portfolio management, or related ambiguities, some key product decisions are seen to be done only at business line / product manager level, or even within customer account teams, without strategic analysis of product suitability to company's product portfolio. More specific challenges face by the case companies related to ownership and governance model are summarized in table 4.

Table 4. Company specific challenges related to product portfolio management ownership and governance models.

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- A in practice CEO leads decision making for product decisions, no written and formal ownership statements done, product portfolio management would require dedicated time and focus
 - B wider the prepared solution is more challenges there are on the final ownership both from sales recognition and technical ownership viewpoints, sales Item level ownership is clear, the definition of ownership requires more clarity as responsibility and expected activities, dedicated and centralized PPM team has been nominated and working but they should have better overview and visibility into product portfolio
 - C product ownership topic has not been discussed in company
 - D the challenge is the collegial responsibility, no focused and dedicated time and responsibility for active and systematic product portfolio management
 - D still some application and platform type of products do not have that clear owners due to missing process and resource gaps both on technology and business side
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4 Target setting and key performance indicators (KPIs) related challenges in PPM

The usability of product portfolio management as a concept and a tool for strategy implementation has not been consistently understood and utilized by the case companies. The main reason for this is seen the lack of product portfolio management understanding as a concept.

Most commonly, the product portfolio management targets have been set for the value maximization, such as revenue, sales, cost, investments and profitability targets in the case companies. The financial targets have been set at the company level, and only in few cases at the level of sub-product portfolios. In addition, the case companies are targeting to reduce their product portfolios and to clean-up data. Both of these targets can be connected to the strategic fit of the portfolio. Also, the “state gate” –process related milestone criteria can be seen as strategic targets, and KPIs on individual products and project levels.

The targets for the balance of the portfolio are not recognized by the interviewees.

On the side of key performance indicators the financial measures are the most common. Total sales revenue, cost and profitability at a company level are the most common ones. **The profitability has been measured only at a company level.** In most of the cases this is not even technically possible due to implemented data and reporting structures of the products. Measuring profitability at a company level might be one of the most critical challenges in case companies. The size of the product portfolios have been mainly measured such as number of sales items and

certain other specific types of items. The strategic fit and the balance of the portfolio have been not measured at all. More specific challenges related to product portfolio management target setting and key performance indicators are summarized in table 5.

Table 5. Company specific challenges related to portfolio management target setting and key performance indicators.

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- A target setting and KPIs in relation to PPM exist on the area of financial measures only

 - B system level solution as combination of many products from several business units creates additional challenges for target setting and use of KPIs, usage of few global invoicing codes creates additional challenges to identification of real profitability of final solutions, sub portfolios and products

 - C the tracking of both sales and cost could be done on product level but not practiced yet, the revenue forecasting methods are not in place and possible future sales can be only mirrored back

 - D lack of more strategic evaluation of potential new customers and their strategic fit to company's business model and capabilities

 - D lack of strategic product portfolio management target setting and KPIs in relation to company's new strategy
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5 PPM challenges related to data availability

The data targets for product portfolio management have not been specified thoroughly by the case companies due to overall lack of product portfolio management as a concept. The product portfolio management as dynamic executive level analysis and decision making process is seen to require data availability and reporting from many angles.

The data challenges identified by the case companies are very generic related to the availability of product master data such as bill of material, item codes in different data structures, product compatibility and configuration rules, list of sales items, products and header level systems and solutions.

The data availability, directly from design tools, product data management tools, ERP tools and sales configurators have been not utilized by managers directly. The reporting capabilities of the tools are seen not to be most flexible, and usage of them is seen to require special competences. Instead of using the data from operative tools, the portfolio management related data has been created manually and presented by universal office applications by management. The smaller the company is the better competence the management has to use operative data systems. **Overall the data availability for the use of portfolio management is seen to require better**

specifications on data requirements. More specific challenges on data availability are summarized in table 6.

Table 6. Company specific challenges related to data availability

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- | | |
|----------|--|
| A | data is available only on one product and data structure layer from the ERP tool, the company has major need for product portfolio and product data definition as concept and structure as critical for new ERP-tool configuration and implementation |
| B | multiple data systems are in place and consolidation of them creates additional challenges for the availability, the information in operational product design tools, product data management tools, sales configurators, ERP tools and services related tools are not consistently utilized in product portfolio management due to lack of competences of using them and partly due to missing reporting capabilities, instead many data files are created manually resulting in reporting errors |
| C | technically product data is available centrally but reporting capabilities require improvements |
| D | in principle all needed product data exists but current product coding method makes the data management inefficient, design-, PDM- and ERP- tools exist but the integrations of them are partly manual |
| D | new modular and platform based product concepts required to be implemented to new ERP tool with limited the amount of product configurations and rules |
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Preconditions for product portfolio management

Product portfolio management is seen as a generic challenge in case companies. The viewpoints to product portfolio management challenges include: 1) generic challenges, 2) processes and tools, 3) ownership and governance model, 4) target setting and key performance indicators and, 5) data availability.

Due to current level of understanding, and the existence of product portfolio management practices in the case companies the improvement activities may need to be started from the very basics. Preconditions for product portfolio management improvement, derived based on both theory and interviews, can be summarized as follows:

- 1. Creation of basic understanding on the idea and concept of product portfolio management.** The very basic training could be given starting from executive board level to get justification and approval for further improvement needs on the topic. The training can be started to unravel the negative impacts and inefficiencies caused by lack of product portfolio management. Tackling the basic questions such as what, how, when and by whom, are seen important for improving product management practices, especially the question why.



2. **Creation of product portfolio management strategic targets and KPIs** based on company strategy. Strategic targets could be classified as a) strategic fit, b) maximized value, c) portfolio balance and, d) portfolio size. Strategic targets can be aligned with overall capabilities of the company. Each strategic target could be divided to measurable sub-targets and key performance indicators.
3. **Creation of strategic product sub-portfolios** to be able to group products according strategic buckets. Sub-portfolios, product families, applications and platforms are formed and created based on agreed criteria and then prioritized. The synergy between product families to be utilized, not only in marketing and sales, but also in technology development and for the benefit of deliver and service processes. The product portfolio renewal and clean-up can be managed based on modular product platforms and data models to gain efficiency in creation and implementation of them.
4. **Creation of product portfolio management ownership and governance models** to manage the entire group of all sub-portfolios and products over the life cycle. New product development, ramp up, maintain, ramp down, warranty and removal phases can form the continuous renewal of product portfolio according strategic and tactical targets. Product portfolio governance models could be organized based on functional responsibilities and/or based on cross functional steering bodies. The difference in product portfolio management and product management to be clearly communicated and implemented. By nomination of dedicated ownership and man power for product portfolio management could improve the focus and speed up the required activities.
5. **Creation of product portfolio management processes and tools** for the dynamic analysis and decision making. Systematic yearly, quarterly, monthly or even weekly management practices could improve the implementation of strategic and tactical targets consistently. By using agreed processes and tools the needed tasks can be done by agreed roles of people in right order, right time and quality. As an enabler the related processes and tools need to be trained and implemented through all sub portfolios and business units under control of product portfolio management.
6. **The data availability** should be developed according needed information for both strategic and tactical management of product portfolios. This requires first the understanding of product portfolio management as a concept, processes and tools but even more as strategic targets and KPIs. The data specification for product portfolio management can be connected to overall product master data specification requirements.



CONCLUSIONS

Product and business evolution from HW orientation to SW products and inclusion of services has been ongoing already for some time. Many companies sell and deliver combined solutions that are a sum of HW, SW products and related services. Offering a wide variety of products complicates a company's product portfolio, potentially resulting in some challenges. Opportunities for additional and new business and turnover may be missed if product portfolio is not actively developed and renewed. The product portfolio renewal and clean-up can be managed based on modular product platforms and data models to gain efficiency in product creation, maintenance and removal phases. Ideally product portfolio renewal happens in balance of new product introductions and old products removals and by synchronized combination of them. This study analyzes the current product portfolio management related challenges faced by companies.

The challenges related to the product portfolio management were identified in practice. The portfolio management is a generic challenge in case companies regardless the size, maturity and history of the case companies. The challenges start from the disconnection between company strategy and expected product portfolio management strategic targets and follow up. The overall idea and the role of PPM as a higher level analysis and decision making process for product portfolio renewal is not thoroughly understood. The usability of product portfolio management as a concept and a tool for strategy implementation is not consistently implemented while only a couple of strategic and tactical product portfolio management tools are utilized by the case companies. The profitability is measured only at a company level due to current data and reporting structures. The entire product portfolio and sub-portfolios are not clearly defined. Lack of product portfolio level business case thinking can be seen as growing size and proliferation of the product portfolio and as product cannibalization. Product portfolio management processes are not described and documented in case companies. The definition of product portfolio management ownership is seen to require more clarity. The governance models of product portfolio management are not structured and implemented formally over entire product portfolio. The overall challenge is to have focus and time by dedicated resources for product portfolio management on needed levels of organization. The data targets and data specifications for product portfolio management have not been defined thoroughly by the case companies.

The preconditions for implementing product portfolio management practices need to be well connected to the fundamental main challenges. One of the very basic preconditions is to enhance the understanding over the idea and concept of product portfolio management, followed by the creation of product portfolio management strategic targets and KPIs according company strategy. Next preconditions are more operative as creation of strategic product sub-portfolios and related product portfolio management governance models. Dynamic and active product portfolio management processes and tools need to be defined and implemented. Finally the last proposed precondition is the creation of data requirement specification according for the need of portfolio analysis and decision making.



The implications of this study include the potential preconditions of clarifying the role of product portfolio management. The findings can aid business managers in understanding the PPM as an entity that has a role in managing products and portfolios based on strategic and financial targets over product lifecycles.

The limitations of this study include analyzing a limited number of companies. Also, the experience of the analyzed companies varies from only few years to a relatively long history. Regardless of that the portfolio management is seen a generic challenge in case companies.

Several questions were raised up during the analysis which might prove worth further researcher activities, including: a) what are definitions of listed preconditions in more detail for implementing them in practice b) Can product portfolios be visualized to increase the understanding over the entire product portfolio c) How is product portfolio management connected to other business processes, and d) Should product portfolio management be raised to the level of other business processes such as R&D (Product process), Sales, Deliver and Service Processes.

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