



## CUSTOMER DEFINITION AND REPRESENTATION IN MARKET-DRIVEN PRODUCT DEVELOPMENT

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### ABSTRACT

**Purpose:** Customers are typically considered the most important external stakeholders for companies. This study explores how customers are defined by product management and development managers in market-driven development. In addition, customer representation during development is studied.

**Design/methodology/approach:** The literature review of the study focuses on customer definition and involvement in product development context, while the empirical part explores industry practices at managerial level through case projects in selected organisations.

**Findings:** Company management and strategy outline customer definition. Product management collaborates with various stakeholders including marketing, sales, management, direct customers, and end-users in customer definition. Product management was found to be the most important customer representative for product development. However, other information sources are also utilised.

**Research limitations/implications:** The case projects may not be able to offer a generalised picture of the topic. Future work should extend the study to cover more industry sectors and companies at various tiers and regions.

**Practical implications:** Company management and strategy must provide proper guidance for customer definition, and management must ensure that product management teams are appropriately resourced and competent. Systematic way of working and good collaboration among product management, product development, and other internal stakeholders is needed. While focus on selected customers is important, other customers in the value chain must also be considered. Product management and development professionals should also have some direct contact with external customers to ensure proper customer understanding and to tackle problems related to conflicting internal stakeholder views.

**Originality/value:** Past literature emphasises customer orientation, however, it has not adequately addressed how customers are defined and who represents the customers in



*market-driven context. The study findings offer a good reference for companies to improve product development focus.*

**Keywords** - Product development, new product development (NPD), product management, customer, market-driven

## INTRODUCTION

Customers are typically considered the most important external stakeholders in product development. Understanding market and customer needs is claimed to be a prerequisite for product success (Cooper, 2011). Customer orientation can be considered part of market orientation strategy together with competitor orientation and inter-functional coordination, and approaches to understand customer needs are proposed in generic product development models (Cooper, 2011; Narver and Slater, 1990; Ulrich and Eppinger, 2000). However, many companies operate in global markets with increasingly complex products and diverse market needs, which demands special attention to methods for fulfilling market and customer requirements.

Product management (PM) aims for customer satisfaction and long-term value for the company via continuous optimisation and renewal of product portfolio. PM consist of various elements, such as product and customer analysis including identification of both stated and unstated customer needs, understanding competitor offerings, roadmapping, strategic management and vision. More operational elements of PM include, for example, product lifecycle management, internal and external collaboration, release planning, and requirements elicitation, prioritisation and management (Lehmann and Winer, 2002; Maglyas *et al.*, 2012).

The objective of requirements engineering (RE) in software development is to ensure a product which satisfies customer and user needs (Kauppinen *et al.*, 2004). Requirements typically come from customers, other stakeholders, and technology related factors. They often change during the project making the nature of RE process iterative (Mottonen, 2009). RE activities cover elicitation, analysis, validation, negotiation, documentation, and management, where elicitation focuses on identifying information sources and requirement discovery (Sommerville, 2005).

In market-driven context products are typically offered to a large number of customers instead of a specific one who decides the functionality. Special needs of market-driven product development (MDPD) include balancing different requirements types, market-pull and technology-push trade-off, and release planning and requirements selection (Fogelstrom *et al.*, 2010). Large number of requirements flow continuously from various internal and external sources, for example, marketing, sales, customer care, users, and customer studies (Gorschek *et al.*, 2012; Kotler and Keller, 2009).

Despite many studies on market and customer orientation (Alam, 2005; Cooper, 2011; Griffin, 2005; Narver and Slater, 1990), past literature has not adequately addressed how customers are defined and represented in market-driven product development. This study explores how product management and development managers define customers in market-

driven development. In addition, customer representation during development is studied. Accordingly, this paper addresses the following research questions:

1. How customers are defined in literature and by product management and development managers in market-driven product development?
2. Who are the customer representatives in development?

This paper addresses the research questions both through literature and empirical study. The literature part focuses on customer definition, role, and involvement in product development. Literature synthesis is presented as a conceptual framework. The empirical study covers industry practices at managerial level through case projects in selected organisations. After the analysis, conclusions are made.

## LITERATURE

### 1. Customers

Customers, also known as clients, purchasers, and buyers, are organisations or parts of it, either a business-to-business (B2B) customers or an end-user consumers, that may benefit from the offering a company provides (Christ, 2009; Peppers and Rogers, 2011). Customers can be current or potential, and all others with problems and needs who seek either product or service solutions (Griffin, 2005). From a manufacturer's point of view, customers include distributors, retailers, and persons who buy products from the retailers (Caplan, 2001).

The customer relationship can be direct or indirect, and the customer may be a paying or non-paying one. Customers may also participate in value creation (Prahalad and Ramaswamy, 2004). Besides external customers, internal customers affect product quality, and should be involved in development early enough (Cooper, 2011; Lukas and Maignan, 1996). Internal customers are important especially for companies operating in international markets, due to limited contact with external customers (Conduit and Mavondo, 2001).

Customers are important source for product development projects, and their input is critical to ensure product success (Alam, 2005; Cohen *et al.*, 2002; Griffin, 2005; Cooper, 2011). Customer input can reduce uncertainty and enable developing foresight to meet customers' future needs better (Un and Cuervo-Cazurra, 2009). Bidirectional communications and joint problem solving with customers enables understanding needs that are difficult to express and developing successful products (Bonner, 2010). However, companies operating in market-driven environment must find the right balance between market-pull and technology-push (Isoherranen and Kess, 2011; Rothwell, 1992). Furthermore, too close relationships with customers may restrict a company to respond to market changes (Sull, 1999).

In addition to immediate customers, expanded customer base and context where the product is used should be considered, as the whole supply chain adoption is a pre-requisite for new product success (Berggren and Nacher, 2001; Jones and Ritz, 1991). Describing expanded customer base and analysing the whole value chain provides understanding beyond direct customer, and may lead to value innovation (Donaldson *et al.*, 2006; Goodrich and Aiman-Smith, 2007; Kim and Mauborgne, 1997). Product end-users must be considered in all cases, but other types of customers and stakeholders may also need to be taken into account (Griffin, 2005; Ulrich and Eppinger, 2000). Customer selection matrix with different segments and type of customers, such as lead users close to the company, is proposed for

choosing the customers to focus on (Alam, 2005; Ulrich and Eppinger, 2000, von Hippel, 1986).

Acquiring useful knowledge from customers is challenging (Alam, 2005; Un *et al.*, 2010). The challenges in business-to-business (B2B) market include large number of parties in the relationship, such as initiators, users, influencers, deciders, buyers and gatekeepers (Kotler and Keller, 2009; Peppers and Rogers, 2011). Furthermore, downstream customers are often seen outside company's control and complicate, for instance, product development and marketing (Hillebrand and Biemans, 2011). Business-to-consumer (B2C) market challenges, in turn, include huge number of individual customers and understanding behaviours of different consumer groups (Kotler and Keller, 2009; Peppers and Rogers, 2011).

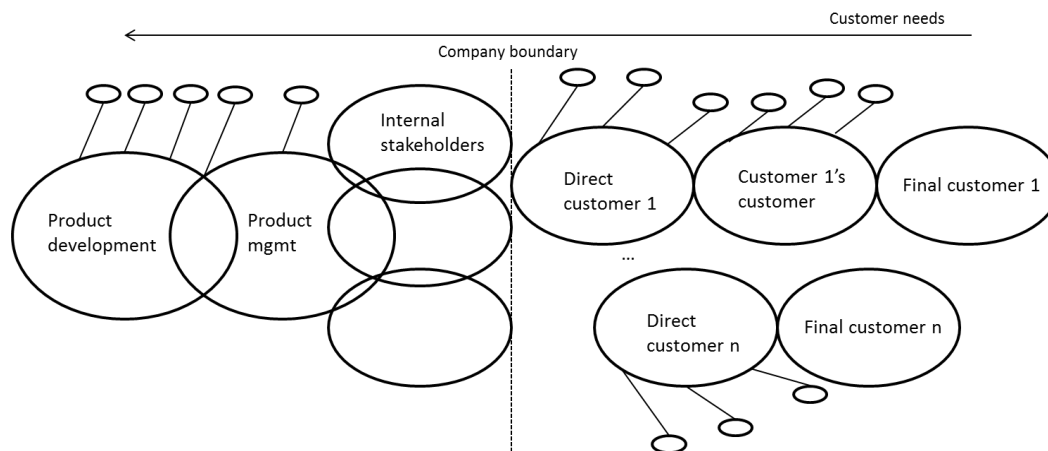
## **2. Product development and customer involvement**

Product development transforms market opportunities into production, sale, and delivery of completely or partially new products (Krishnan and Ulrich, 2001; Ulrich and Eppinger, 2000). Product development projects can be classified into research and development (R&D) projects, breakthrough projects, platform projects, derivative projects, incremental improvements, and fundamentally new products (Schilling and Hill, 1998; Ulrich and Eppinger, 2000). Small change projects entail interacting with customers to acquire tacit knowledge about their needs and current product deficiencies. NPD to existing markets, in turn, requires translating customers' unmet tacit needs into product features without an existing product. In NPD to new markets, customer interaction typically takes place only when a prototype is available (Un and Cuervo-Cazurra, 2009).

In terms of customer engagement, product development can be categorised into design for, design with, and design by customers. In design for approach products are designed on behalf of customers, which also characterises market-driven product development (Fogelstrom *et al.*, 2010; Kaulio, 1998). Customer studies, such as interviews and focus groups, are typically utilised in this approach. In design with approach customers can additionally give feedback on the proposed design, whereas in design by approach customers actively participate in the design of their own product (Kaulio, 1998). Customers' role is also seen active in customer co-creation and open innovation (Chesbrough, 2003; Prahalad and Ramaswamy, 2004).

## **3. Conceptual framework**

A company can have a number of external direct customers with different importance. Customer needs are affected by both internal and external stakeholders in the customer organisation. Direct customers may also have customers that can be final customers or intermediaries. Figure 1 illustrates customer definition and representation from product management and development perspective.



**Figure 1.** Customer definition and representation from product management and development perspective

Some customers are represented by the company's internal stakeholders, whereas other customers and their needs must be identified by other means. Product management and product development have to take into account many type of customers with different needs. Product management is assumed to have a major role in customer definition and internal collaboration with customer facing functions. In addition, successful requirement engineering is needed to transfer the right requirements, and thus enable creation of products that meet customer needs.

## METHOD

The empirical part of the paper is based on two case projects including insights from interviews with mid-level managers. The managers represented both product management and development, and a total of 11 professionals were interviewed (Table 1). The companies were chosen from ICT industry, and one is in B2C and the other in B2B market.

**Table 1.** List of interviewees in the case projects

Case	Interviewee	Role	Industry experience
A	1	Product management	+10 years
	2	Concept management	+10 years
	3	Product management	+15 years
	4	Software product owner	+10 years
	5	Programme management	+15 years
	6	Project management	+10 years
B	1	Head of product management	+20 years
	2	Product management	+20 years
	3	Product management	+25 years
	4	Technical solution management	+25 years

Case	Interviewee	Role	Industry experience
5		Platform system design management	+20 years

A semi-structured interview process was used to gain insights of the cases and respondents' thoughts regarding the issues studied. Interview questions are presented in Appendix A. The interviews typically lasted around one hour, and they were recorded and transcribed for analysis. The interview questions were designed to gain each manager's perspective on customer definition and representation in product development. The interviews started with general questions, but included also specific follow-up questions to elaborate on company- and project-specific issues.

The data were analysed using a qualitative approach of reading the interviews several times, each time going deeper into the data to discover connections, patterns, and comparisons. Emerging patterns were structured into more generic categories that helped refine the conceptual framework and define the key concepts. Based on the categorisation of individual cases, a cross-case analysis was performed to find patterns, similarities, and differences between the cases.

## **EMPIRICAL SURVEYS**

### **1. Case A**

Case A is a software project of large ICT company that operates in a global B2C market. The project entailed a software release programme starting from concept development and ending to launch. In addition, the architecture of the software platform used in the final products was renewed. The final products were targeted to specific consumer group, but also wider market, distribution partners, and geographical requirements were taken into account. In contrast to earlier projects in the company, the product definition was started from scratch, and only a core set of features was defined for sales start. In addition, way of working in product development was renewed. This included, for example, specifying testing of new features already in their definition phase, and changing requirement and error database structures to support the new mode of operation. The project can be classified as a market-driven product development project with large number of customers to be served. In terms of size and newness, it was considered a large-scale, radical project. The development model used in the company was based on agile principles.

### **2. Case B**

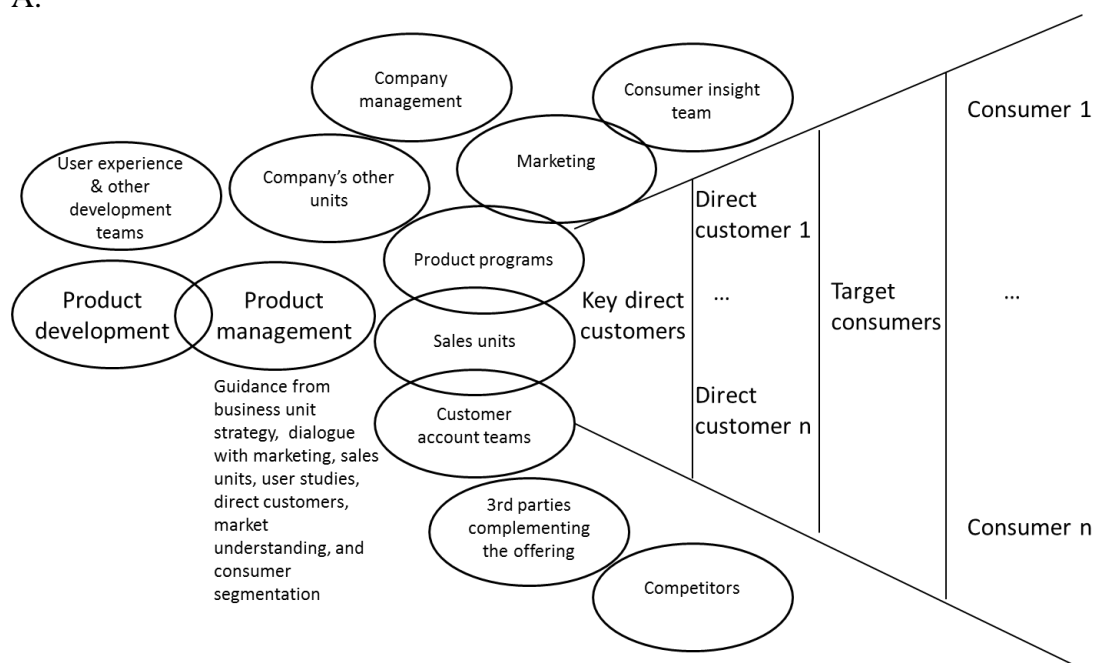
Case B is hardware and embedded software project of large ICT company that operates in a global B2B market. The project entailed development of new product platform to replace the current solution in the market. The platform is used by the company's business lines, which productise final products to external customers. The final products were focused on selected key customers, but also wider market including different technical and geographical requirements were considered. The product was very complex, and thus the development time was relatively long. The project can be classified as a market-driven product

development project with large number of customers to be served. The project represented a typical platform development project in the company, although it was somewhat larger than usual projects in the organisation. The development model was based on concurrent engineering for hardware components and agile principles for software parts.

### 3. Project key stakeholders and customer definition

#### 3.1 Case A

In case A, various stakeholders were identified for the project, and interviewees presented many viewpoints for customer definition. Figure 2 illustrates the customer definition in case A.



**Figure 2.** Customer definition from product management and development perspective in case A

Product management representatives saw that key external stakeholders in the project included consumers (product end-users), distribution partners (direct customers), and competitors. In addition, one interviewee pointed out external innovation partners. Regarding internal stakeholders, the research and development (R&D) organisation, sales units, customer account teams, and product programmes using the software were classified as key partners. Marketing and other internal sources for consumer data and competitor information were also seen important. In addition, other company units, such as another business unit and long-term research unit were categorised as key stakeholders.

Representatives from product management highlighted many ways for defining customers. Dialogues with marketing, sales units and regions were considered to be important, and business unit strategy was also seen to provide guidance for customer definition. In addition, the largest direct customers were considered to be important in the customer definition. However, consumers were clearly described to be the most important customer group, and

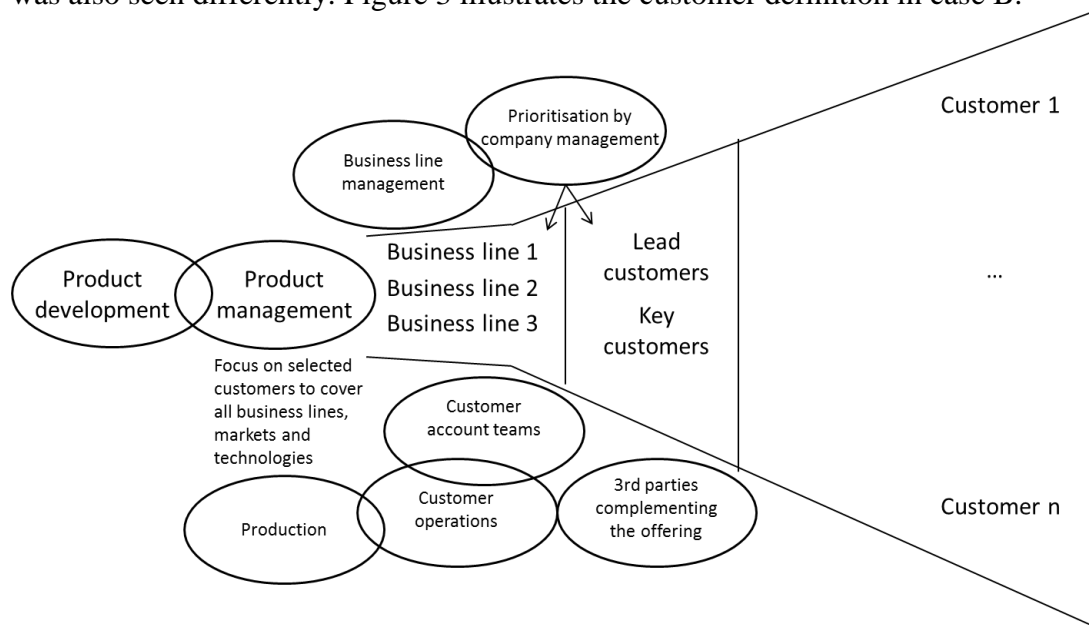
the definition of consumer customer was assisted by collecting and analysing user databases and studies. Furthermore, company-wide market understanding and consumer segmentation were seen beneficial.

From product development representatives' perspective, key external stakeholders included direct customers, consumers, and 3<sup>rd</sup> party application developers. Key internal stakeholders, in turn, included product management, product programme using the software, sales units and regions, marketing and the internal organisation dealing with 3<sup>rd</sup> party application developers. In addition, development teams in different sites, user experience team, and company management were considered as key stakeholders.

Product development representatives saw that customer definition came from product management, marketing, and consumer insight teams. In addition, the management team of the product programme utilising the software, and especially its product manager were considered to be involved in customer definition. Interviewees also mentioned also a "theme person" that illustrated a target consumer, but it was unclear for them who created that theme person.

### 3.2 Case B

In case B, fewer project stakeholders were identified than in case A, and customer definition was also seen differently. Figure 3 illustrates the customer definition in case B.



**Figure 3.** Customer definition from product management and development perspective in case B

For product management representatives, the most important external stakeholders in the project included direct customers and 3<sup>rd</sup> parties complementing the company's offering. Key internal stakeholders, in turn, were considered to be business lines that funded the development, research and development (R&D) organisation, customer account teams, management, operations taking care of customer installations, and production.



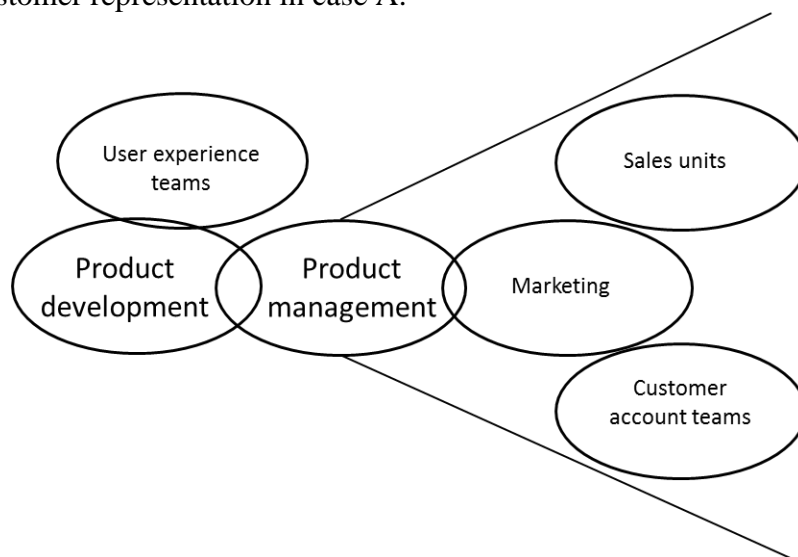
Product management representatives' customer definition included both internal and external customers. The company had three business lines that were considered to be internal customers, and the business lines were prioritised based on sales volumes and growth potential. The company's external customer base consisted of hundreds of direct customers. The company had defined priority markets, and the most important customers were classified as key and lead customers. Customer prioritisation was done by the company management. However, product management representatives saw that there were still too many focus areas, and the priorities were not clear. To ensure sufficient customer understanding, product management had selected 20 customers from the lead customer group for direct connections. In addition to sales volumes, the selection criteria aimed to cover different types of customers, all three business lines, and various geographical and technical aspects.

Product development representatives saw direct customers to be key external stakeholders in the project. Key internal stakeholders, in turn, included product management, business lines, business line management, and portfolio management that facilitated decision making regarding technology choices. Customer prioritisation was acknowledged, but customers' short-term and narrow focuses were considered as challenges from platform development point of view. Regarding internal customers, a lead business line, which might not have the highest business priority but productises the platform first, was also considered important.

#### **4. Customer representation in development**

##### **4.1 Case A**

In addition to customer definition, the representation of customers was also analysed. Figure 4 illustrates customer representation in case A.



**Figure 4.** Customer representation from product management and development perspective in case A

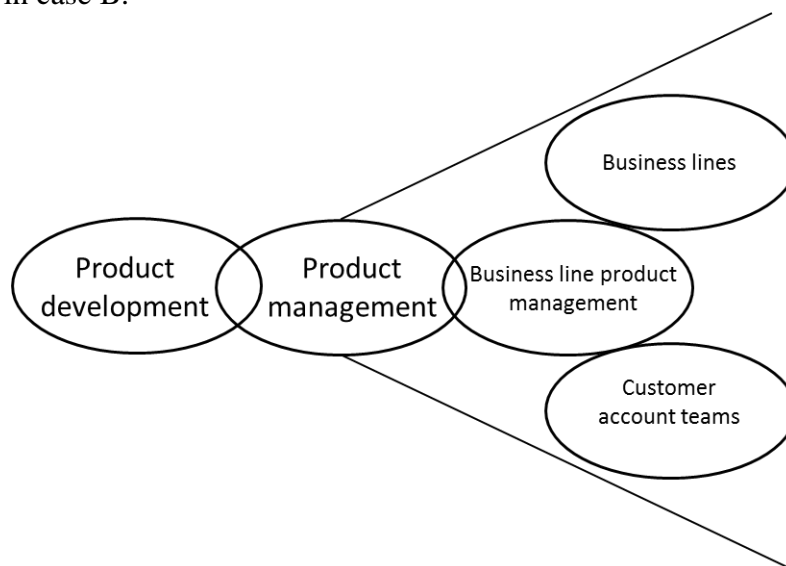
Product management representatives saw that product management represents customers for product development. Customer voice to product management, in turn, was seen to come from sales units, customer account teams and other regional contacts, and marketing. In addition, user databases and market surveys were seen as important information sources for

product management to gain necessary knowledge for representing the customers in development.

Product development representatives also considered product management to represent customers, and product management was expected to collaborate with relevant stakeholders to acquire necessary information from the customers. On the other hand, user experience teams were also seen to represent consumer (end-user) view during development, since these teams possessed understanding of detailed product functionalities from usability perspective. In addition, end-user research, analyses, testing, market data, and error databases provided customer related information during development. Finally, in this particular project, requirement database and existing products were checked to identify critical customer features, and these were discussed iteratively with stakeholders close to external customers. Contrary to the previous projects, only a core set of features was defined for sales start.

#### 4.2 Case B

Customer representation was also analysed in case B. Figure 5 illustrates the customer representatives in case B.



**Figure 5.** Customer representation from product management and development perspective in case B

As in case A, product management representatives saw that product management represents customers for product development. The customer representatives from product management's perspective consisted of business lines, their product managers, and key customer account teams in contact with direct customers. Tools for customer representation and providing feedback included databases and the relevant contacts in the organisation. In addition to meetings at customers' facilities, key customers also visited the company to discuss special topics directly with product management. Market reports were also used to some extent. Internal customer representation was ensured with business lines' participation in the project organisation. Downstream customers (direct customers' customers) were considered only little, since the direct customers were seen to represent their views anyway.



Product development representatives also confirmed that product management represents customers. This was considered a good arrangement, although it was pointed out that product management has a “challenge to interpret things that customer do not know they want.” Discussions, presentations, and excel files were used for communicating customer views, before entering requirements into relevant tools. Regarding internal customer representation, technical management and concept teams with representation from business lines were mentioned.

## **5. Other findings**

### **5.1 Case A**

In case A, product management representatives highlighted the need for technology-push and market-pull balance, since both were considered important. The importance of systematically gathering and using customer related information was also emphasised. User understanding, finalisation of product and features, and differentiation in product implementation were considered important, since similar market data was also available for competitors. In addition, distributing consumer and target group understanding through organisation was considered important. Sufficient face-to-face involvement with end-users was seen lacking currently.

Representatives from product development emphasised that unnecessary handovers between product management and development must be avoided in project definition. Furthermore, testing and verification should be taken into account already in the definition phase. In addition, especially people developing features were considered to benefit from seeing how end-customers use the product. However, this was realised to be too expensive in practice. Individual developers were also recommended to use the products and features they are developing to gain a user perspective.

### **5.2 Case B**

In case B, product management representatives emphasised that customer contacts are extremely important. Talking to key customers also directly was seen as a good practice. Account teams’ and customers’ views were seen to differ sometimes, since the account teams focus on selling the current products. Furthermore, unclear responsibilities, getting the needed internal commitment and organisation changes were seen as challenges, since internal customers might change during the project. “Gut feeling” in product definition was considered important, since customers were seen to be uncertain on their long-term needs. Involving internal stakeholders early as possible was also recommended, and especially good co-operation between product development and product management was seen critical.

From product development representatives’ perspective, understanding customers and deciding how to optimise the product, was considered a challenge. From platform development perspective, better prioritisation in decision making was desired. Time-wise, both external and internal customers’ focus was seen different from product development. However, it was pointed out that both current customer issues and long-term needs must be considered.

## DISCUSSION

This study indicates that customer definition and representation in market-driven product development is not unambiguous. Product management plays a key role both in customer definition and representation, and must effectively co-operate with many stakeholders to ensure a product that meets customer and market needs while providing business sustainability. Product management must understand the overall picture and has responsibility of the right balance and product priorities, both from customer and business perspective. However, product development cannot transfer the responsibility of customer understanding solely to product management. The right product design involves deciding a large amount of details. In addition, seamless cooperation between product management is required. For example, in case A avoiding handovers between product management and product development in project definition was considered a good practice.

### 1. Theoretical implications

Literature discusses the importance of customers for product development and presents various definitions of customers (Alam, 2005; Cohen *et al.*, 2002; Cooper, 2011; Griffin, 2005; Peppers and Rogers, 2011). However, customers cannot directly participate in actual development when structural product development processes are used. Furthermore, in market-driven context products are typically offered to a large customer base, which significantly complicates customer definition and representation. The literature review and cases analysed in this study provide new viewpoints on the ways customers are defined and represented by product management and development managers.

The role of product management has been discussed in the literature (e.g. Maglyas *et al.*, 2012). The results of this study indicate that product management plays a key role in customer definition and representation. In addition, co-operations with many internal stakeholders were emphasised in the cases. This is in line with inter-functional coordination (Narver and Slater, 1990) and the role of internal customers (Conduit and Mavondo, 2001), which have been considered important in the context where the case companies operate. The study also illustrates the differences between business-to-consumer and business-to-business markets. In case A, end-users were seen to be more important than direct customers. On the other hand, in case B, downstream customers were considered only little (Hillebrand and Biemans, 2011). Finally, the research is in line with Fogelstrom *et al.* (2010) by supporting the importance of market-pull and technology-push balance.

### 2. Managerial implications

Creating a successful product requires that target customers are clearly defined. This study indicates that the role of product management is essential in market-driven product development; companies must therefore ensure that product management teams are appropriately resources and competent. Company and business unit strategy should provide proper guidance to ensure that focus and priorities are clear. In addition, product management must collaborate with various stakeholders including marketing, sales, and management in customer definition.



The study results highlighted the importance of internal customers and inter-functional coordination. Managers should target systematic way of working and good co-operation among internal stakeholders to ensure that customer views are taken into account. Forming customer definition should be seen as a dialogue between product management and stakeholders close to the customers. On the other hand, effective co-operation between product management and product development is vitally important too.

Whereas product management is the most important customer representative towards product development, other useful information sources also exist for product development to gain customer understanding for the design decisions. Documentation's role is important, since customer information flows via several stakeholders. Besides internal inputs, product management and development professionals should aim for direct contact with external customers, since proper customer understanding results in better decisions and tackles problems related to conflicting internal views. While focus on selected customers is important, the whole value chain must be considered to create a product that meets market needs.

## **CONCLUSIONS**

The significance of customers as key product developments stakeholders is evident. However, increasingly complex global markets pose challenges for companies to fulfil the market needs. This applies especially when products are offered to a large number of customers instead of a sole one deciding the functionality. The validity of customer information that flows via various stakeholders is also a challenge. This study explores customer definition and representation in market-driven product development.

The results indicate that customer definition in market-driven product development is not unambiguous. Company management and strategy must guide customer definition. Product management plays a key role in defining customers, and companies must therefore ensure that appropriate resources and competences exist within product management teams. Effective co-operation should be targeted among product management and internal stakeholders. Product management was found to be the most important customer representative towards product development. However, product development must also gain customer understanding to ensure the right design decisions. In addition, facing external customers sometimes directly is recommended for both product management and product development professionals.

The limitations of this study include the number of case projects being only two. Recommended future study includes how well the study findings apply to different types of companies and industries. In addition, customer need identification and methods used should be analysed. Finally, prioritisation of unique needs and the relationships between requirements and stakeholders deserve attention.

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## APPENDIX

### Appendix 1. Interview questions

#### *Background*

Tell about your current role and position, and previous experience

What is your company's offering?

- What do you sell, to whom and with whom you co-operate to provide the offering?

What is the role of product development in your company?

- What is your opinion of the right balance between technology-push and market-pull?
- How important is it to consider customer and market needs in development?

#### *About the project*

Tell briefly about the case project and your role in it

- Was the development customer-led, collaborative with customer, or market-driven (large number of customers to be considered)?
- Was the project typical full-scale product development project or radical project?
- Was the product development model type waterfall, concurrent, or agile?

#### *About the stakeholders and customers*

Who were the external and internal stakeholders in the project?

- Especially, who were the most important stakeholders and customers?
- How do you understand term "customer"?
- Who were the internal customers in your company?

How did you identify the most important customers?

- Who defined the customers?
- Did you use any systematic methods to identify the customers?
- What were the good practices and key challenges?

Who represented the customers in development?

#### *About identifying customer needs (the results not included in this paper)*

How did you identify the customer needs?

- Did you collaborate with customers? With whom and how?
- Did you use any systematic methods?
- What were the good practices and key challenges?

Did you utilise the following methods?

- Surveys, interviews, observation, web sites, focus groups, customer discussions and workshops, identifying lead users, becoming a user, customer integration into product development team
- With whom did you use the methods?

#### *Final comments*

Do you have any other comments related to this topic?





## **BIOGRAPHICAL**

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