



Kai Hänninen, Tuomo Kinnunen, Matti Muhos and
Harri Haapasalo



Rapid Productization – Empirical Study
on Preconditions and Challenges

Working Papers in Department of Industrial
Engineering and Management 1/2012

**University of Oulu
Working Papers in Department of
Industrial Engineering and Management 1/2012**

**Kai Hänninen, Tuomo Kinnunen, Matti Muhos and
Harri Haapasalo**

**Rapid Productization – Empirical Study
on Preconditions and Challenges**

ISBN 978-951-42- 9813-4
ISSN 1459-2401

**Kai Hänninen, Tuomo Kinnunen, Matti Muhos and Harri Haapasalo,
Working Papers in Department of Industrial Engineering and Management**

Publication Committee, University of Oulu, P.O. Box 7500, FI-90014 University of Oulu,
Finland
Oulu, Finland 2012

Abstract

Rapid productization is a new concept originating from the practical challenges of case companies. The purpose of this paper is to provide tangible examples of what are rapid productization preconditions and challenges in high-tech companies in sales situations. This study seeks to answer to the following research questions: what is rapid productization and what are preconditions and challenges for rapid productization? The research approach of this study follows constructivism and utilizes qualitative research to empirical observation based on interviews done to target enterprises and specialists. The need to quickly respond to new customer preferences addresses new structure to companies in changing business environment. Rapid productisation offers a framework for companies a new way how to solve a lack of offering in existing portfolio or service. Limitation of this study is that productization and rapid productization is not yet a stable concept in academic research. As a result of this study, a sales and rapid productization frame was formed. This study provides guidance for the managers considering rapid productisation as an option to serve customers better and improve agility within organisations. Rapid productization seeks to add value to a company in sales negotiation.

Keywords: Rapid productisation; productisation; product life cycle management; PLM; product management; portfolio management; new product development; NPD; sales process; sales

**Kai Hänninen, Tuomo Kinnunen, Matti Muhos ja Harri Haapasalo,
Oulun yliopiston tuotantotalouden osaston työpapereita**

Julkaisutoimikunta, Oulun yliopisto, PL 7500, 90014 Oulun yliopisto
Oulu 2012

Tiivistelmä

Nopea tuotteistaminen on uusi käsite, joka perustuu tutkittujen yrityksen käytännön haasteisiin. Tämän tutkimuksen tavoitteena on luoda konkreettisia esimerkkejä siitä, mitä ovat myyntitilanteessa korkean teknologian yritysten nopean tuotteistamisen edellytykset ja haasteet. Tässä tutkimuksessa vastataan seuraaviin kysymyksiin: mitä nopea tuotteistaminen on ja mitkä ovat nopean tuotteistamisen ennakkoehdot ja haasteet? Tutkimusmenetelmänä on laadullinen yrityshaastattelututkimus. Tutkimuksessa esitetään malli miten vastata nopeasti myyntitilanteessa asiakkaan esittämiin uusiin vaatimuksiin ja pyrkiä näin ratkaisemaan tuote- ja palvelutarjonnassa oleva puutteet. Mallin hyödyntäminen mahdollistaa yritykselle uuden nopeamman tavan tuotteistaa haluttu lopputulos. Yritykselle tämä tarjoaa mahdollisuuden lisäarvon luomiseen myyntineuvottelujen aikana. Yritysjohdajille tämä tutkimus antaa esimerkin tuotteistamisesta, jonka avulla on mahdollista palvella asiakkaita paremmin ja samalla nopeuttaa organisaation toimintaa.

Asiasanat: nopea tuotteistaminen; tuotteistaminen; tuotteen elinkaaren hallinta; PLM; tuotteenhallinta; tuotesalkun hallinta; uuden tuotteen kehittäminen; NPD; myyntiprosessi; myynti

Contents

Abstract	1
Contents	3
1 Introduction	4
2 Research Process	6
3 Literature review	8
4 Results	12
4.1 Sales process	12
4.2 Rapid productization	17
4.2.1 Process	18
4.2.2 Preconditions	19
4.2.3 Challenges	22
4.2.4 Challenge of product data and product structure	24
5 Conclusion	27
5.1 Future research opportunities	31
6 References	32
7 Appendix: English version of the questionnaires	34
7.1 Appendix A: Interview form (August/2011)	34
7.2 Appendix B: Interview form (November/2011)	36

1 Introduction

In a modern solution business quick decisions are often required at sales. There is a need to productize new product items to counter customer requests. Companies are facing pressure to continuously supply new innovative products with increasing speed to the market. Responding to a specific customer requirement through product differentiation is valid means to succeed in global competition (e.g. Huang et al., 2008; Froza and Salvator, 2007).

Increasingly sophisticated customer requirements necessitate a wider variety of offering and hence more delicate new product development (NPD) to battle development complexity and avoid introducing outdated products. Managing development duration, cost and quality demands cooperation between numerous teams which create and utilize product knowledge in multiple distant locations. Such NPD calls for product lifecycle management (PLM) to integrate different processes and their agents through a shared body of knowledge. (Ameri and Dutta, 2005). The effective sharing and utilization of product data are necessary for enabling rapid product launches (Ouertani et al., 2010; Huang et al., 2004; Sulaiman, 2000; Philpotts, 1996).

Traditional productization with NPD is often not an adequately fast or flexible way to proceed in the commercial world of today. There is increasing pressure on companies to produce end-to-end solutions to the market with increasing speed. The challenge in solution selling is how to productize new sales items so that they fit into the product strategy of the company and are also controllable.

A new item has to create fitting for a current product portfolio if a fast replay to the customer request is needed. Decision making at sales is demanding and challenges arise a) in order to make reliable and reasoned productization solution and b) to be able to manage the solution sold during its lifecycle. Rapid productization offers an answer to support controlled productization in sales situation.

In sales situation it is essential that a sales and rapid productization process can use different product data views during ongoing sales negotiations. However, not all the product data is need to be on one tool/database (Figure 1).

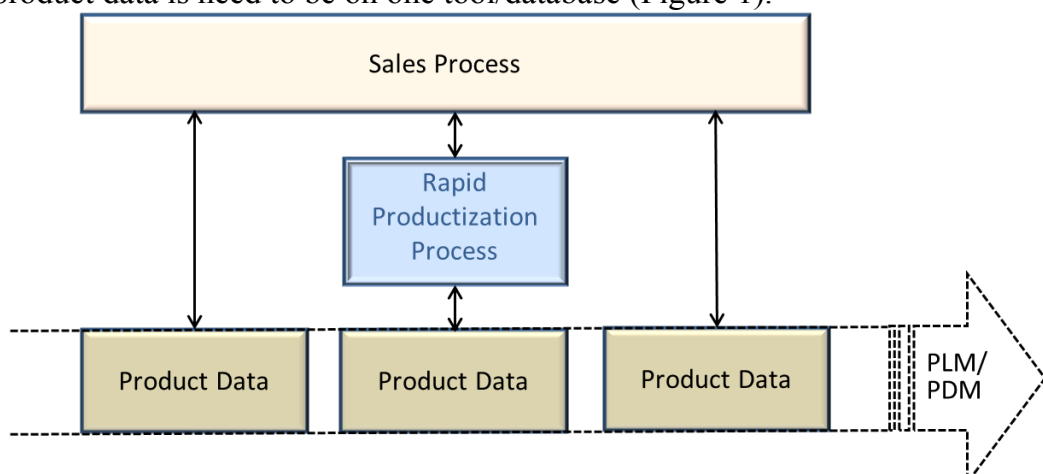


Figure 1. How sales, rapid productization and product data link together.

Rapid productization means processes which add value in sales situation on the top of an existing product / and service portfolio to reply a customer need. In this report, the aim is study what are preconditions and practical challenges on rapid productization. A sale is the very important portion of a customer relationship. A

sale negotiation presents a key role when talking about a success of productization. An obvious target of a sale negotiation is to generate sales to a seller and satisfy a customer needs.

Sales situation can be done using a sales configurator tool which will help a sales person to manage wide-ranging and complicated variety of products. Rapid productization process is not required if a solution the customer requires is already possible to offer during a sales situation. Product configurations are challenging to deploy and manage in practice due to the vast number of products and product variants as well increased complexity of single products (e.g. Froza and Salvator, 2007).

Sales negotiation become challenging in case an offering of a seller and needs of a customer will not meet in a way that is enough to satisfy the customer. In practice this will mean a situation where offered product or service range is typically lacking something the customer expects to have. In this situation, the sale must be resolved whether to continue sales process or not. If a sales process shows, that a business case is not economically viable the sales process does not of course be extended.

The first step after decision in order to continue sales process is to gain understanding what is missing from the offering the customer requires. Second step is to find out an optimum way to fulfill customer requirements and create missing part of the offering. Traditional way is to productize new product offering by NDP process. However, this study focuses on rapid way of productization meaning that productization process starts right away a sale negotiation and sales person as well as customer (Figure 2). The use of rapid productization process as early as possible speed up the entire turnaround time of sales process, this because time needed to find out a proposal speed up as well.

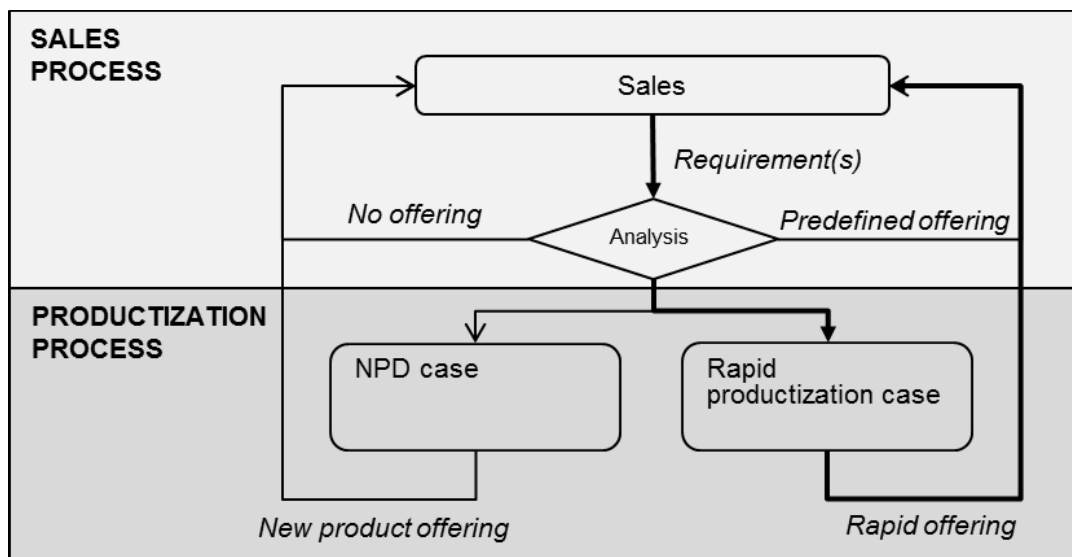


Figure 2. Analysis of a sales response.

The objective of this research is what are the preconditions and challenges for rapid productization in the sales situation. Focus is on how to rapidly bundle a new solution during a sales negotiation.

To achieve the goal set the report aims to answer the following objectives:

- 1) What is rapid productization?
- 2) What are preconditions and challenges for rapid productization?

2 Research Process

The research approach of this study follows constructivism and utilizes qualitative research to empirical observation based on interviews done to target enterprises and specialists. The research follows a constructive research method. The constructive approach means a problem solving through the constructions of diagrams, plans, models and organizations (Kasanen et al., 1993). The constructive research method is typical for a technical science and the approach is normative at nature. Constructivism is defined as an innovative approach aimed at solving real-life problems (Okkonen, 1993).

This research begins with an introduction of the literature review of productization and rapid productization. Literature review is divided into six sub-categories: defining the concept of product, solution as products, productization, productization through and platforms and rapid productization. Each sub-category is then reviewed through literature research. Based on the literature review a synthesis is built in order to answer the first research question.

Qualitative research can point out any type of research that produces finding which are not results of statistical or other means of quantification (Strauss & Corbin, 1998). It is design to tell the researcher how and why things happen as they do (Cooper & Schindler, 2008). At the data collection phase, techniques can include e.g. focus groups, individual depth interviews and case studies (Cooper & Schindler, 2008). During analyses, the qualitative researcher often uses the content analysis of written or recorded materials. Qualitative research aims at in-depth understanding about the situation in hand (Cooper & Schindler, 2008).

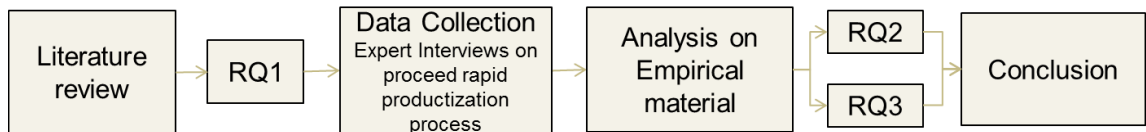


Figure 3. Research process

The empirical study consist of semi-structures industry interviews. The research process is described in Figure 3. The interview questionnaire was formulated base on the literature review (see the Appendix for the questionnaire). Interviews were conducted in a qualitative manner, allowing the interviewees to explain and clarify the case and topics as entities. Interviews were conducted in twelve heterogeneous companies to obtain a wider view on the studied subject.

The study included altogether 29 interviews. The interviewed industry experts were selected carefully on the basis of their professional background and expertise. Selected participants hold responsible positions related to productization and PLM. The experience and the current interest ensured high motivation and among the participants and up-to-date knowledge to the discussed topics. The interview questionnaire was sent in advance so that the interviewees had the opportunity to explore the questions in advance. All the interviews were recorded and transcribed to enable deeper analysis. All the individual interviews were analysed separately in order to find the rapid productization challenges. Transcribed interview was sent to the interviewees' for a review and comment.

The interviews were conducted in twelve companies see in

Table 1. The companies can be divided into two types: 1) to products, services, solutions and manufacturing and 2) to professional services producing companies.

Products, services and solutions manufacturing companies are large national or multinational companies. These companies are able to offer a comprehensive study material, the extent of the phenomenon. In particular, however, a rapid productization and use of product data at the sales is a challenge for them. Companies advanced practice and advanced product development processes can be used as a comparison with other participating companies. Expert solutions are produced by companies in turn provide a good source of information on how the rapid productization and solutions productization will be adopted. The topics that were merely company specific rapid productization challenges are not reported in this report.

Table 1. Company characteristics.

<i>Key Characteristics*</i>	<i>Area of product or service business</i>
Medium-sized	Metal machinery
Medium-sized	Contract manufacturer in food industry
Medium-sized	Health care provider
Medium-sized	Contract manufacturer in sheet metal engineering
Large	Joinery
Medium-sized	Forest and agriculture machinery
Large	Data networking and telecommunication
Large	Business and technology service
Large	Telecommunication
Medium-sized	Product life cycle management
Large	Business and telecommunication service
Micro	Consulting

*Company size classified according to EU Commission definition (2005) SMEs (1-9, 10-49, 50-249 and >250 persons employed).

3 Literature review

Businesses of today are expected to provide solutions to customers in a quick and easy manner. The traditional way of developing products from the beginning for customers is not enough anymore, and thus traditional productization is not suitable for current needs in many cases. A new concept of rapid productization is seen as a possible solution for this problem. In rapid productization, a piece of the final offering is produced at the point of sales: the solution is highly based on the existing product portfolio, but something new is added to it at the point of sales to finalize and customize the product for the customer.

A format for rapid productization is needed, which is 1) replicable 2) strong and flexible enough so that numerous solutions can be formed from the single format. Productization as such is a familiar term (Artz et al., 2010; Holma, 1998; Jaakkola et al., 2009) but theoretical research about the concept is needed to clarify the research area. From there the concept of rapid productization can be formed.

Defining the concept of product

In order to be able to study productization, one should first define what a product is. Generally people tend to think that a product is a physical artefact, produced in manufacturing. A service, on the other hand, can be defined as any non-physical function or performance, which one party offers to another, and does not lead to any physical ownership. The definition of physical products and services separately has become too limited and narrow minded for the commercial world of today. (Rope, 2005; Kotler, 2003).

In terms of productization a product is defined from the marketing and sales point of view: The product is the entirety that the customer sees and buys, or anything that can be offered at market to answer a certain need or want. This is what product will mean in this context of productization. (Rope, 2005; Kotler, 2003).

A product is something sold by an enterprise to its customers. Product development is the set of activities beginning with the perception of a market opportunity and ending in the production, sale and delivery of a product. Dimensions for successful of product development are product quality, product cost, development time, development cost and development capability. From development processes and organization point of view an enterprise must make two important decisions about the way of carries out product development. It must define both a product development process and a product development organization. A product development process is the sequence of steps an enterprise employs to conceive, design and commercialize a product. (Ulrich and Eppinger, 2008).

Solutions as products

In addition to physical products and services, end to end solutions (E2ES) are becoming of more and more importance. Solutions mean final offerings which put together diverse items and provide one package to answer the customer needs. End to end solutions is a widely used term, and refers especially to application or program suppliers who also provide hardware and software components and all resources to answer the customer need, without involving other suppliers at customer interface. Therefore E2ES providers give the customers everything they need; only implementation is needed. Furthermore as all the parts of the solutions

are not always provided by one company additional challenges are added. (Bonney & Williams, 2009).

Therefore the solution business is about answering the needs of a customer in one package. Thus productization in this field is extremely relevant. To conclude, in literature, productization often refers to the development of services, tools and solutions especially but can just as well refer to any kind of product which is offered to any customer. (Kurvinen, 2008; Holma, 1998; Sipilä, 1996).

Productization

Productization is a practical concept to support the communication between marketing and design people over the product development. The main idea behind productization is that after the company has fulfilled the basic NPD goal of importing well designed products into the supply system, it still has to seek means of selling them profitably. Internally this means matching the offering to the operations to improve efficiency. Marketing-wise, productization means building a more appealing offering. (Simula et al., 2008).

Productization has many definitions. The basic idea behind the concept though, is the act of modifying something to become a commercial product; customers usually do not want to buy a technology or an idea in itself, instead they want these technologies ideas in a refined, processed form – as a product. Productization is also about representing the know-how of a company via a defined, clear and easily purchased solution for a customer's problem. Productization includes, for example, the acts of defining, specifying and profiling of products; the process of adapting new products to fit the market needs; modifying company know-how and capabilities to meet customer requirements. (Kurvinen, 2008; Holma, 1998; Sipilä, 1996; Valtonen, 2007).

Productization starts from the very first steps of new product development. Simplified, productization can be thought to include the research and development process and the marketing and sales processes. During marketing and sales processes customer requirements are mapped and later customers are told why they need this product and what the benefits are. This way the original customer requirements are modified into a product and then a commercial product. In this research productization is concluded to mean the following: (Jaakkola et al., 2009; Lehtinen and Niinimäki, 2005).

Productization is used as a term without a clear definition in several papers. Suominen define the term productization as a standardized process which aims to produce a high quality commercial food or service in the market from produced information. The starting point to productization is produced information. The goal of productization is to package the offering, technology or service, so that a customer can understand the content of it in advance. (Suominen et al., 2009).

Productization through modules

Restaurants are often used as an example of productization – moreover they can be used as an example of modular productization: Not anyone can produce great food, with same quality and in large quantities – this is why so many restaurants fail within a year of start-up. Moreover, there are a very few restaurants where a customer can customize their meal to which ever extent they want; It would take a long time, cost a lot more and be very hard to control, if the chef needed to be prepared to produce any dish the customer wanted. To reduce costs and time among other factors, customers usually choose what they wish to eat from a menu: the

owner or chef has already thought in advance about what the targeted customer segment would want to eat; he has created and tried out the dishes, and also created a menu. Thus he has developed products and productized them. When the customers come to the restaurant, they can choose an appetizer, a main course, a dessert, and drinks from the menu: they can choose different modules. This way, customers are able to build up their own meal and customize it from the different options on the list. (Parantainen, 2008; Jaakkola et al., 2009; Kurvinen, 2008).

Modular product development is becoming more and more popular today – largely due to the customer need to customized products. As explained in the restaurant example, the idea is that by mixing and matching different modular components, a large number of different products can be made: the different combinations gives different functionalities, features or performance levels. Therefore, the customer can choose the modules that fit them best. Thus modular product development gives important strategic flexibility and agility. Modularity can be executed in different ways. For example, in the two ways below (Langlois and Robertson, 1992; Sanderson and Uzumeri, 1990; Ulrich and Tung, 1991):

- 1) There are one or more basic modules, which are the same for all products and additional auxiliary modules can be chosen to customize the end product. In addition to these, some parts of the product can be customized specifically to individual customers, so they are “non-modules”, and have to be developed.
- 2) The end product can be customized from modules, without any basic module. Also “non-modules” can be added here.

The computer industry is a leader in modularity: highly complex products and processes are built from smaller subsystems which can all be designed independently, but still work together as one whole system. By modularity, the computer industry has increased the rate of innovation dramatically. This is what can happen in other industries also. Modular product development often refers to physical product manufacturing, but it can just as well be implemented to services and solutions. As it is so far developed, the financial sector provides a good example of service modularity – even productized modularity. Modules include services such as managing portfolios, selecting assets, conducting trades, keeping records, reporting and transferring ownership. These can be provided by one or many service providers and together they create solutions for customers. Baldwin and Clark (1997) suggest that the dynamics of competition will change, when modularity increases: suppliers of key modules will gain important power and companies will compete either by making the dominant design rules, standards, or by producing competitive modules which fit into the standards. (Baldwin and Clark, 1997; Langlois and Robertson, 1992; Sanderson and Uzumeri, 1990; Ulrich and Tung, 1991).

Productization through product platforms

Platforms are a special form of modularity. Meyer and Lehnerd (2000) define a platform as a “set of common components, modules, or parts from which a stream of derivative products can be efficiently created and launched”. Thus platforms act as the basic module of a product if you will – the basis on which, for example product families and applications can be built on. To conclude, a platform is the common set of physical or non-physical modules on the base of which numerous products can be created on. (Gawer and Cusumano, 2002; Sanderson and Uzumeri, 1995; Ulrich and Eppinger, 2008).

As an example of platform usefulness is Sony's Walkman: Sony produced more than 250 different models in the U.S. market in the 1980s, based on only three platforms. It is obvious that platforms enable innovation growth and faster solution creation: further examples and proof have been provided by companies like Intel, Microsoft and Cisco Drive. Moreover, from faster solution creation it is fair to draw conclusions, that platforms could also be a very useful tool in rapid productization. (Gawer and Cusumano, 2002; Meyer and Lehnerd, 2000; Sanderson and Uzumeri, 1995; Ulrich and Eppinger 2008).

Rapid productization

Sales and marketing play the largest role in rapid productization of all organizational functions – of course short project lifecycle non-module development and consulting are performed by R&D or product owners outside of the sales organization. However, most tasks are sales/marketing owned. The solution formed via rapid productization is based on the existing product portfolio, modules or platforms, but the solution can be customized to customer specific needs at the point of sales. But when new solutions are made rapidly like this, it might be hard for the customer to understand what they are buying, so the productization does not stop at just building the solution. In rapid productization it is crucial for sales and marketing to perform the same tasks as in traditional productization to concretize the product. This is referred to as productization as seen to customer in this context. (Bonney and Williams, 2009; Parantainen, 2008.)

Productization seen as a customer consists of many aspects. First of all, naming and pricing of a solution are very important and apparent to the customer instantly. Marketing can also give references and stories of the product usage. This will give concrete examples to customers of how they can benefit from the product and create a larger figure of the solution in questions. In a way, it can be thought that the benefits of the product are also productized. Moreover, customers want something physical, even if the solution itself is unphysical. In B2B sales especially, financial impacts in the form of calculations concretize the solution well showing the results and impacts also. (Parantainen, 2008).

Rapid productization is not a widely used or established term. Therefore some background for the term is needed before searching for existing examples in literature: There is increasing pressure on companies to produce products to the market with increasing speed. Furthermore, physical products are rarely the only offerings that companies produce today: services and other intangible products are becoming of growing importance. In addition, customers are voicing their need for end to end solutions from companies. The challenge in solution selling is how to productize the new sales items so that they fit into the product strategy of the company and are also controllable. The needs of customers in the solution business can change rapidly and thus traditional product development – from beginning to end – is inadequately slow and costly: there is a need for new, efficient methods of product development. These new methods should also ensure product controllability. All in all, the new environment requires quickly producible solutions. This in turn places additional challenges especially for sales and marketing and product development. The question is how to provide and sell solutions legally – ensuring delivery – and profitably. Rapid productization is seen as a possible answer. Rapid productization is a format where something new is created in the sales situation in addition to forming the rest of the solution from the base of existing portfolio. (Gebauer, 2010; Huhtala and Pulkkinen, 2009; Martin and Horne, 1992).

4 Results

Resolution to start the use of a rapid productization should be done during a sales process. This is, however just a beginning like one interviewee pointed out:

“The rapid productization cannot be just a salesman’s promise”.

4.1 Sales process

Usually, a business-to-business (B-to-B) sale is based on a product or service oriented marketing. Where an aim is to sell products or services exist in a portfolio to a customer. A use of rapid productization process might provide a resolution in case customer’s needs or requirements cannot be fulfilled by a sellable resolution based on the portfolio or product roadmap.

“Sales situation is more or less negotiations between a sales team and a customer what can be delivered. The sales team tries to solve situations in case the customer’s request is not workable. In that case there is a separate process which analysis what can be delivered”.

It will require a systematic planning and seamless co-operation between a sales team and experts to start a new customer relationship. One interviewee explained a start of sales as follow:

“The sales situation typically started on by our active contacts with the customer. Sales people will be supported by experts. The role of the sales is to manage a commercial side and the expert to build the necessary material packet which supports the sales.”

The sales situation is different in those cases in which the company has a constant client connection with the customer. In this kind of a situation, the initiative will often come from the customer in the form of the request for tender and in it, the demands and schedule are set for the product. The sales organization prepares the final offer to the customer together with the technical support functions according to the agreed approval process of the company.

A simplified sale process (Figure 4):

- 1) sales organization of the company contacts a customer and demonstrates the portfolio or service,
- 2) alternatives which are in accordance with the product portfolio are discussed with the customer and
- 3) negotiation leads either to the order and to the delivery or the negotiations ends without the agreement.

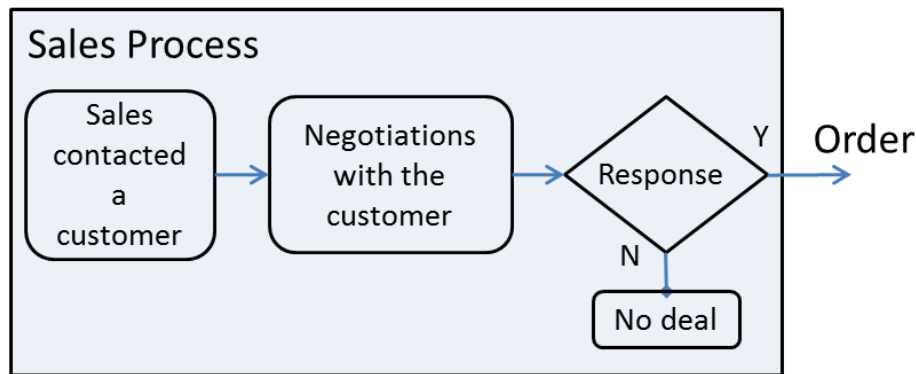


Figure 4. A simplified sales process.

Before the sales take contact to a customer is worthwhile, the sales must first do its own homework's. Perhaps the matter is self-evident but this way the edge of the matter is not, however. This came forth during in the interview several times.

” I have tried to say to the product management organization that the sales must be familiar with three basics: 1) a product itself, 2) the cost structure of the product and 3) what is an order delivery time of the product. In my opinion, the seller will not be able to sell a product if he or she is missing any of given basics.”

It has been possible to set for the sales team such targets which set the internal challenges for the sales process. Because of these targets the making of homework's could be more difficult.

“The sales performance must be as cost-efficient as possible when it is talked about the software project. As a seller it is being quite differently worked in the cost pressure and the competition is quite of a different type.”

In the interview, the sales of the physical product were characterized as more concrete than the sales of the service.

”The selling of the service is interesting because nowadays the objective is not to sell only the software and after that the whole matter will be forgotten. The service sales will be very different type of selling at that stage when the target of the selling moved for the changing of the customer’s operations model.”

The product management which takes place in the sales situation is made in most cases with the support of the portfolio management. Depending on the company the portfolio can be a worldwide or a local. In an interviewed company *“the objective is to have the global product portfolio whereby a product range is managed”* in the sales situation. An attempt is made to portfolio the comprehensive solution offering to the customer by variation. An interviewee stated the following one about the configuration.

“I would say that a configuration in a way fast making a marketable product. We try to offer such a portfolio that we would not need to begin anything new. The objective would be that it is possible to configure the necessary new product from an already existing one.”

The configuration work itself can take place by utilizing a separate configurator tool. However, there is no help from the assisting tools for sale if the productization has not been managed up to the end in the company:

“One thought about our own product management where the place of the improving would be how we can be as fast as possible in able to pack a solution. Still so that the service products would be better produce together as a part of a total solution. We lack the elements which such a basic set of sales could take over from other products to certain businesses.”

“The place of the strengthening is how to produce services and the doing of the basic package suitable for to different businesses.”

The same problem is raised forth in several interviews. The efficient use of a configuration in the sales situation requires that the product platform should be modular enough.

It is ordinary that the customer is kept up to date from the portfolio of the company and from the following development steps particularly in long client connections. In spite of this, the situation the customer present a new demand which cannot be met with the help of the existing portfolio is often arrived in the sales situation. The new demand which comes in the sales situation is challenging especially from the point of view of the company if only one customer has presented it. The big politico-commercial sales decisions which must be approved in the uppermost management of the company are also challenging.

The challenges of the sales situation are:

1. the background of the sales staff affects how the sales situation will be taken care (is it a solution or a quantity sales),
2. how the customer's need or requirement has been understood,
3. can to the customer's need be answered with a product portfolio (using hardware, software and service products) and
4. the price of the product.

In the sales situation in which the customer presents new demand or requirement the sales staff's technical and commercial knowledge as well as skills will be under the test:

“If in the sales situation the whole portfolio has been presented and if after that a totally new matter arises out, so yes, the salesman is in that situation honestly saying in weak ones. The actual professional of the sales will ask three to four days more times and the new meeting where to demonstrate the proposed new solution. In the sales situation, the only solution alternative left is to ask for more time and a new meeting.”

If the sale is not able to realize a solution easily to the presented request, it is easy to answer that the customer's demand does not belong to the product field of the company. This is very strongly affected by the fact whether the sale person has a product or a solution base selling attitude. The professional skills and education of

the sale staff set challenges to the sales management. The control and process of the sales must be in control and up to date.

“The progress of the sales negotiation is, of course, related to in some extent also to the sales person's know-how and desire. The answer to the external request of the portfolio depends on the sales person's background. The salesperson which has a sale background of a software license answer typically it is not possible and they will ask the customer to contact an external partner. Correspondingly, those sellers who have experience from the solution sale try to find out a resolution to new demand on the top of the portfolio. This should not be seen as the problem of the sales team. It is a question of a challenge of the sales management team. Its how the sales management team is able to manage and bring needed tools available to the sales team. This will start from the assumption that the sales team knows products which to sell. In this way it is easier for the sales management team to lead the sales process.”

From the point of view of the success of the sales situation it is especially important that the customer's needs are understood right. After this it can be estimated how well one is able to respond to the customer's needs within the portfolio of the company.

”The new requests will come typically through the dialog between the sales and a customer. Normally during the negotiations there are also issues which can carry out easily. On the other hand there are matters where we can say “okay” it is possible to do but we haven't do it yet. It can be a question of a situation in which our product development states that this was already the third time when it was heard about this matter. In this situation, we can invite all those customers to a common negotiation and design together what could be done.”

Always needs of the customer and what the company can supply will not meet. This leads to the fact that the customer presents new wishes from what the product or the service should be like. The customer's present new demand leads often to the situation where the demand cannot be solved immediately during the sales situation. In this situation, the demand has to be taken to the experts of the company for the future handling.

To the question, "Is it possibility to identify a need for the rapid productization in the sales situation?" was obtained the following answers:

- *“Actually yes, those sellers who will have a background of the solution sales identify. The identification is based on the person's vocational know-how”,*
- *“The possibility of the rapid productization is identified but it is really dependent on what it is asked for. We have tried to get speed consciously with configurability and on a business model”,*
- *With those words, I would say yes. However, it can be only the fact that a customer agreement can be achieved and reason to signing the deal.*
- *It is identified, of course, but it is not conscious operation and according to different people the methods to be used vary,*
- *The rapid productization is not a theoretical question it is part of everyday business. It is identified and it is used. The most important question is how to do it in a controlled way,*

- *At the study stage that usually is seen, there would be the possibility of the rapid productization.*

The factors which restrict the carrying out of the customer demand are often the missing availability of person or production capacity. Also the customer can set unrealistic schedule wishes themselves which cannot be redeemed. How should be the local demand carry out if the company has only an international portfolio is especially challenging to the sales organization?

On the other hand, the sales situation can offer the channel also which can be used to develop its own supply.

“In the spring, we received a few good hints from customers how the matters would be worth making. On the basis of the feedback, we included the reforms in our portfolio. The situation has developed so that we will have matters now to offer to customers what they have ever need or not imagined earlier.”

The size of the company affects what kind of challenges the new demand in the sales situation can possibly cause. A big company can use more resources than a smaller company and at the same time utilize the advantage which is due to the bigger organization. On the other hand, a smaller company can utilize its smallness by reacting to more agile to new demands presented. One interviewee stated that:

“Our company is small and agile in which case the core of the business is faster than for example compare it to our system supplier.”

The rapid productization and its identification offer, the alternative to continue the sales process in the situation which the portfolio of the company does not respond to the customer's needs.

“Rapid productization, it takes place at the sales negotiation stage.”

The identification would be easier if the company's rapid productization process were described from the sales point of view. The process of the rapid productization must be so simple that sales known how to use it. The sales staff has to be trained into use of the process. It is worth in addition to mention a functioning process and education also to remember the accumulating of the tactic knowledge which takes place in the company.

“How would the possibilities of the rapid productization be better identified? I would develop the operation of the company. The transparency to the customer project pre-defined results would be better and the results would be faster in use on different organization units.”

This means that the process must always be updated, if necessary, to correspond to the practical situation. However, the sales needs more than just a good process knowledge of the rapid productization. In addition to the commanding of the process, the precondition for the fluent selling is that the sales know the right person contacts according to the organization. Furthermore, the available product data must be correct and being up to date all the time. The importance of the comprehensive product data is emphasized in the product management as well as sales and

marketing. Defective or wrong pricing units, usage units and measure information can even prevent the sales of the product.

During the sales process, the sales transaction must be transparent itself. New demand and its related technical information which has been received during the ongoing sales situation must be available to everyone taking part in the sales process. The main information which is essential to a proposed solution is should it support a local customer only or should it be compatible also with the whole portfolio. That is why it is especially important to make sure that all needed information which is processed in the sales situation is up to date and available to all the parties.

Table 2: Product data challenges in sales

Main challenges in sales is the availability of a product data

- where and what information is available,
- where and how it is applied and
- who owns the information and maintained it.

4.2 Rapid productization

The rapid productization in the sales situation can be can be thought of as an innovation. The innovation is needed from the fact that during the sales process the right ways to make the desired solution must be found fast. For that reason it can be called as a sales innovation. Not always the rapid productization is even a conscious way of action (Figure 5). An interviewee stated:

“We have not developed the process in consciously. It has not been anyhow in our plans. We make rapid productization, either in the sales situation or in that project where the product package is accumulated.”

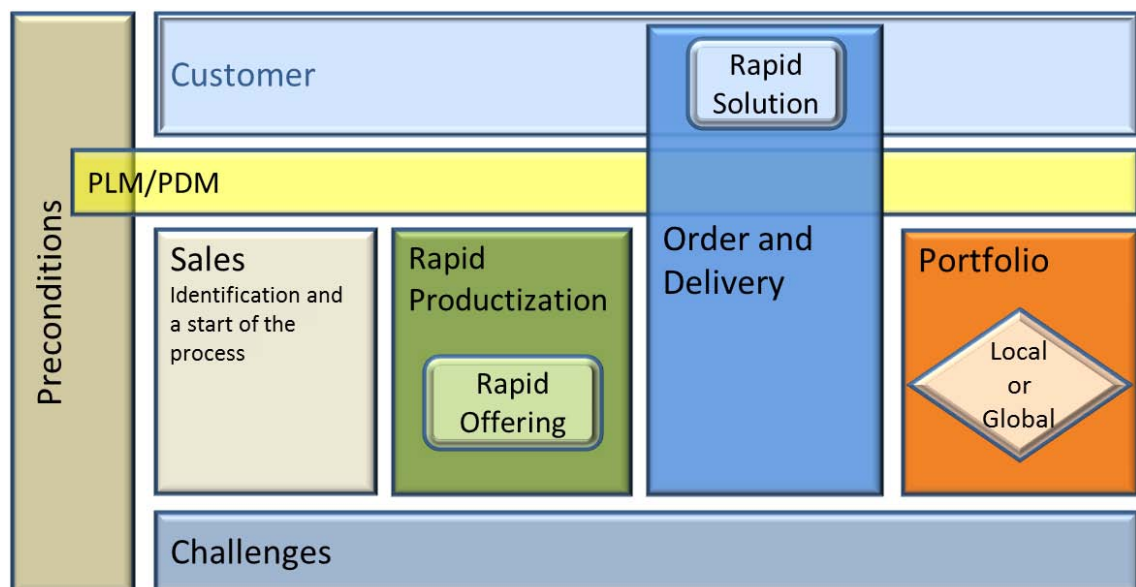


Figure 5. Rapid productization and main interfaces.

4.2.1 Process

What does the rapid productization process mean? Two interviewees stated the following one here:

“Thinking roughly to the examination a normal productization process product must be taken as a starting point and all the time-consuming parts must be eliminated from it. If it is gone to a rapid process, then one must ask what things can be accelerated and the matters can be dropped away which don’t bring any speed.”

“Basically, it is not separate anyhow from what is done also otherwise but a case is made quicker, fast decisions about a rapid cycle and with a smaller group (on the core group). A little more risk is perhaps taken. In our case, the basic process is the same; it is done with the faster cycle.”

The process of the rapid productization will start when the sales receive, document and analyze a new customer demand or the – demands.

“The process of the rapid productization includes absolutely requirement management and the pass of things followed by a PLM process.”

The continued handling of demands is carried out in close cooperation with the sales and the productization process. The productization process will deliver the proposed solution to the sales process after the analysis has completed. The proposed solution is delivered to the sales process in such a form that the sales can leave an offer on the basis of it to the customer.

The proposed solution might have the following information base on the interviews 1) a risk analysis, 2) resource estimation, 3) an analysis of delivery capability, 4) an impact analysis of life cycle and 5) the calculation of the total viability of the project. The objective of the process of the rapid productization which starts from the sales situation is to accomplish with a fast agenda a comprehensive solution which satisfies both parties (Figure 6). **The process of the rapid productization starts in sales situation. The customer will need something more and for that there is no direct match in a portfolio. The rapid productization process ends to the rapid solution.**

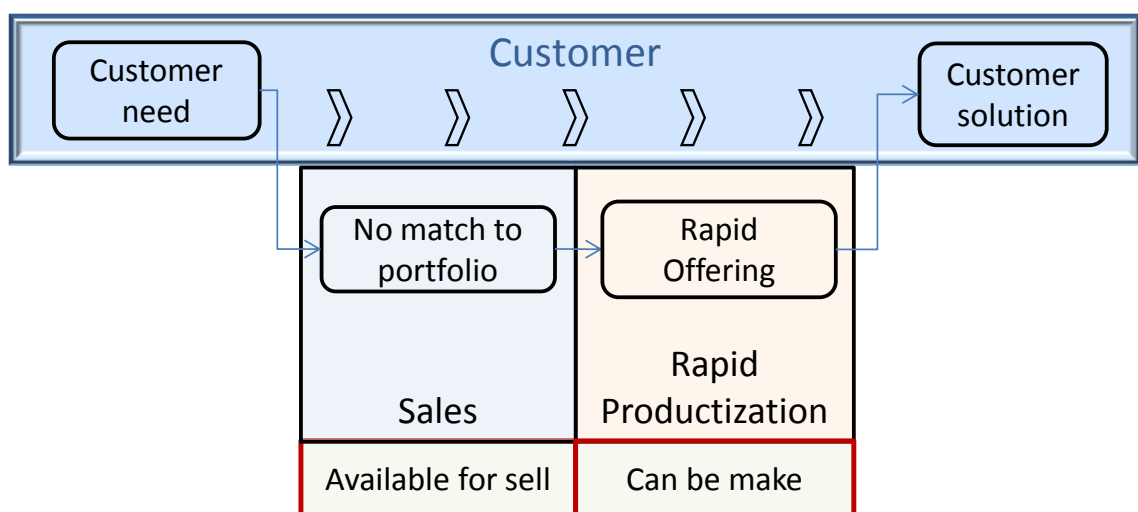


Figure 6. A rapid productization process in a nutshell.

The process of the rapid productization can lead 1) for the customer's order and agreeing on the delivery, 2) for the termination of sales negotiations the agreement does not satisfy both parties and 3) the start-up of the product development project of the normal R&D cycle.

4.2.2 Preconditions

The rapid productization is an alternative at that stage when the sales realize that the usual methods of sales are not suitable for to be used. In that case the solution which satisfies the customer's demands cannot be produced using an existing portfolio, for example using a sales configurator or a sale catalog.

In the interview it was mentioned to why the use of the rapid productization would be justifiable for several reasons:

”The rapid productization is reasonable for example in the situations in which the different operators compete from different suppliers”,

”The rapid productization is a sector where we should invest. Particularly, if we want to support growth of the company and on the other hand serves as a better quality”.

On the other hand, rapid productization is not needed if the product or service is such nature that it can be made e.g. by configuring immediately in the sales situation. The situation will be the same if the customer tailors the product or the service suitable by himself. Briefly:

”The project must be profitable. The main reason for us as a company is to make money to the shareholders. So yes, the profitability is always everything and a must.”

In the business situations, however, will come such a case that the company is ready to give up even from the profitability. In the interview it was manifested, that

“If an objective is to take over the market share and we want to be the market number one, the projects are so then carried through faster. This mean that the competition can be so hard that company is in live or die situation. In some cases, a company can be ready to take even the defeat when the situation requires so. In those cases, the speed will be an important competition factor.”

The product or solution that has been productized fast has to fit seamlessly in the business processes of the company, such as in the order and delivery process and in the product management. In the interview, it was said that

”The rapid productization must fit into the portfolio and strategy of the company. That is why it cannot be talked about totally new technologies or solutions. The technologies to be used must be well known and its must be suitable for an existing portfolio.”

It is essential that the analysis work required for the rapid productization and especially when clarifying the delivery capability will be done by following processes that are already in use. It means in practice that the process of the rapid productization should exist and is in use. From the point of view of the success of

the sales process, it is essential that all needed information is correct and up to date and transfers between different organizations parties smoothly in the process of the rapid productization.

The factors which are critical from the point of view of the success are the fact that the sales understand the customer need and identify possibilities for the rapid productization through by the product portfolio. In practice this means that the sales must understand the solution wanted by the customer and how it would be possible to carry out using an existing product portfolio fast to develop the desired product or service.

“The challenge is how to make all the questions needed for the implantation. The danger is that for different reasons the matters are presented either too positively or negatively. Where is a right level of knowledge where can be trusted in different situations?”

The sales process must be able to identify what are the circumstances required to the profitable business in the rapid productization. The use of the rapid productization cannot be the automatic solution of the sales to be used all the customer's needs. The rapid productization cannot be the only method used to offer flexibility for to the portfolio. At the beginning of the sales a matter that must be secured together with the customer is that before to start the analysis of the proposed solution the necessary preconditions to start work exist.

“If the demands, presented by the customer cannot be solved at once in the negotiations one solution has to contact the technical experts of the problem area. The companies have in advance different agreed operations models which are brought if necessary into use for the making of the realization solutions available.”

Two the alternative to the practical organizing appeared as follows in the interview:

“A foundation for the rapid productization would be a predefined team or organization which would correspond to the opportunity market situations. In that case it would be possible to process the case really fast if it is decided that the case proceeds up to be executed.”

”The rapid productization is clearly separately a process of the carrying out of our own products. However, one does not keep without forgetting the common joints of cases. The actual product development process should not be linked with the process of the rapid productization.”

The rapid production is not meant for developing radical innovations but to create items to complement the existing product portfolio. In the rapid productization, the totally new product segment cannot come to the question if there is not technical or other necessary know-how sufficiently available during the sales situation from the company or from the company's partners. In addition to this, the new product to be made or the service should be modular and must support the already existing portfolio. Interviewees stated as follows:

1) *“In order that the case can be simply presented, the modular and configurable product structure is needed”* and

2) *”The modular product structure offers a benefit that its help a reused different product structure levels”*

The new product or the service must be compatible with the business strategy of the company.

“There must be necessary know-how available fast.”

This especially means that there must be technical know-how available at the analysis stage of demands. It must pay extra attention to the effect of the life cycle of the product. In the interview, the following one was stated:

”When it is come up to make a rapid productization, a plan of the whole life cycle must be made to the solution. The big picture must be understood.”

The decision-making is easier if at the beginning is known weather rapid productization or traditional R&D way will be used,

”if the similar need has come forth by more separate customers. In this situation it is often easier to advance the case through a normal product development process (NPD).”

It is essential to the success of the rapid productization will a new product or service to be made already at the stage of the offer or just before the order making. In other words has the new product or service been first sold and after that the process of the rapid productization is started or already during the sales negotiation has been utilized the rapid productization for the accomplishing to the comprehensive solution. The preconditions to start the rapid productization process in the sale situation are:

- the customer's demand is understood, identified and described,
- a product or service which meets the customer's demands will not be found in the sales portfolio (the portfolio or the configuration of the product does not offer a customer, a satisfactory solution),
- the rapid offering supports the existing portfolio and
- the traditional product productization does not come into question because of the longer implementation time required.

In many companies the foundation of the product data will not be yet at that level that it would be possible to utilize it in a sales situation. Especially that is the case when the business is extended rightly from the hardware to software and services business.

“There have been talks how the management of the product information and the modularity can be managed. Should management be as component wholeness’s instead of individual components? For the software, the situation is the same: it should be as modular as possible. When making a software variation, the whole software does not need to be changed but instead is enough that the necessary modules are changed.”

In the interviewed companies, this means that: *”the modularity and easy to configured are the ways where it is attempted.”* The making a rapid productization

during the sales process will be easier if the portfolio of the company is based on the platform thinking and the products are modular. As an interviewee stated about the matter:

“Making of new product or service is more easily if the product is modular and it can be configured.”

First target of the research was to define preconditions that companies are facing related to the rapid productization. Empirical material was analysed to achieve this objective and rapid productization related preconditions are summarized in Table 3.

Table 3. Summarizing the rapid productization preconditions.

Sales

- A sale process is under control: a customer understood what they are buying and the sales what they are selling,
- The sales can offer a portfolio to a customer and portfolio changes are possible to make,
- Use of rapid productization can't be an automatic resolution to a customer need,
- The company is a customer-oriented,
- A rapid response to customer requests belongs to a company's strategy,
- An offering will support a business strategy and there is a strong business reason to find a solution / rapid offering,
- Configuration methods like versioning, variation, personalization do no provide satisfactory solution,
 - Predefined offering is not what the customer wants,
- Used technology is well known and
- Needed technical knowledge is available.

Product data management

- Product data up-to-date and available to all,
- Modular and easy to configure,
- Common product structure and place for information storage.

Process and information sharing

- Rapid productization can't be one and only solution to be used to solve a portfolio shortage,
- Start rapid productization process fast enough after a need for it appears,
- Analysis of rapid productization and in particular the ability to determine the delivery is made by following existing processes
 - Rapid productization process and guidelines exist,
- Sales has been train how to use the process,
- Organization support: predefined fast decision making structure and information sharing and
- Easy and fast access to all relevant and needed information,
- Use of a NPD process is not a resolution.

4.2.3 Challenges

In principle, the basic competence for the sales includes to understand about customer's needs, problems and know-how of the product portfolio, especially which they are selling. An interviewee stated:

”The challenges cause the doings of the people along in the projects which can be seen at the aim of an individual execution too often.” Furthermore, the following one was stated: *“the rapid productization is in its weakest state in the situation where the local sales team promises a solution to the customer makes an agreement and in fact has not understood at that stage what it the solution in question.”*

The changes in the focuses of the business targets must be taken into consideration. In the interview the following among others one was expressed:

”The share of the services increases all the time in our turnover and margins. The challenge is the fact that in the company with a culture of license selling prevails. It should now be possible to change this culture into the culture where the license sales and services sale would be better in balance and so that they would support each other in a quite new way.”

The following one was mentioned as a challenge of the rapid productization related to the management of the portfolio:

“Are all products owned by the global business units or is a country-specific one (a region) product ownership also allowed in addition? In case the local product ownership would be allowed who takes responsibility for the building of the order-delivery-capability? Would the responsibility of the global organization stay or would it be on a local organization?”

We are able to talk about the process of the rapid productization only at that stage when it is identified, described and taken into use in the company. The following one can be stated about the initialization of the process:

“At the first stage it is critical to make sure that the use of the rapid productization process starts so that the work will function and the product will be created.” After the starting point *“it is important that use of the rapid productization process has been established and all people in the company will operate according to the process.”*

In rapid productization process right accuracy and availability of information is a challenge. The information must be accessible to all parties in the sales situation. Furthermore, the information must be defined and recorded in the agreed way. There is no extra time available in the rapid productization for the identification and repairing of the faulty information. The danger using incorrect data is that the final outcome does not answer the customer's demands.

In the traditional productization there is more time to revise the existing problems than it is it available in the rapid productization. Enough time must be found as well to the making of the offer. The challenge is to make the organization structure support both the traditional (NPD) and rapid productization.

“The challenge is how the organization of the company is able to stretch to make happen what is needed with the rapid productization.”

Furthermore, the company must be able to balance often already very high work load. It was stated about the management of the work load that

”The good resources management makes a good result possible. It is a quite simple fact.”

“Decision making” is essentially connected to the rapid productization. Simply saying that is *“possibility to make decisions”*.

The culture of decision making has to support the rapid productization. In the interview, the case appeared as follows:

“It is really important that the right people are making the right decisions in the right stage. This can be achieved if the culture of a decision making of the company is fast and as straight forward as possible. This means the use of empowerment, if a case is in the person's own area he should also decide.”

It is difficulty even impossible to estimate how the customer itself is able to prepare the challenges of rapid productization. Does the customer have genuine possibilities to follow a schedule and a resource plan supported by the customer’s management at the beginning of the project?

“How is the customer himself ready for the model of the rapid productization? The customer requires in the invitation of tenders that the work should be started by the end of the year. How can we be sure in the offer stages will the customer have a genuine chance of being involved in the project with the same scheduling which its management requires?”

4.2.4 Challenge of product data and product structure

The modular product structure and its advantages have been identified in interviewed companies but the issue is still challenging. An interviewee stated:

”The fact is that the modular product structure does not exist yet from all the parts and that is a challenge. Furthermore, the fragmenting of the product documentation causes challenges because there would not be as clear patterns as it could be in use.”

Often a big part of the product data is lost so that it would be possible to rightly use. A sales configurator tool can be used for sales items management but move to the easy to use and manage product data structure which is solid requirement in the sales situation require more wire meters. In practice the product structures are often described at a very technical level. That cause troubles and there should be a tangible link to the productization. A fact based information chain from the product structure to the sales items and configurability needed. This information must contain information from a cost structure, follow-up data and a product life cycle.

“In any case the information management of the product data is challenging because the product information changes all the time. That is why the maintaining of the data and the keeping it up to date in different systems and through separate business processes. The second challenging issue is a need for transparency over the business processes.”

“Even though the certain product information would have been concentrated on one or two positions (for example engineering BOM and others) the problem is connected with the fact that is not all information exist. The sales items, the cost information and follow-up data or the information attributes are in many locations. The management of information is a big challenge.”

Uses of 3rd party product or service will increase the risk during the sales situation. The next information should be identified during the sales process:

- product or service going to be used,
- the owner of the product or service,
- price and a level of total costs,
- a supplier,
- order and delivery time,
- available status,
- critical components and
- volume capability.

The study shows that in several cases the product data is so fragmented that on the basis of it the making of correctly timed decisions is challenging. Another challenge is especially in the rapid productization case are related to the ownership of the product data: Who owns and is responsible for the product data during a rapid productization? Who will own the product and product data after the rapid productization?

The rapid productization will link together different areas of business processes like: a sales process, a productization process, an order process and a delivery process (Figure 7).

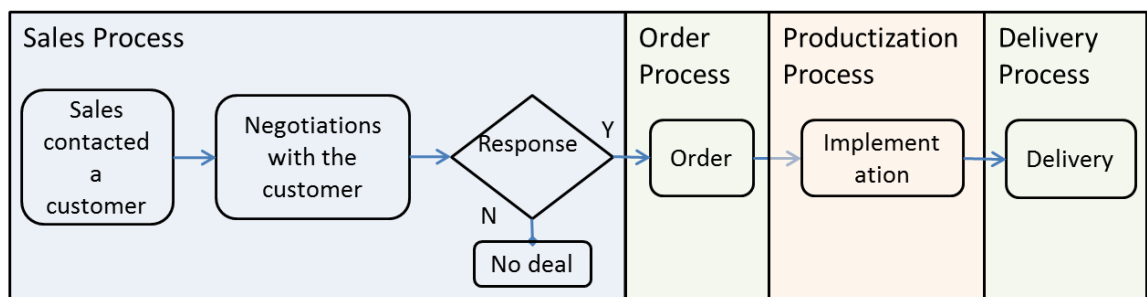


Figure 7. How different processes are linked together.

Correct and up-to-date product data is must in able to analyze the need presented by the customer in the sales situation. Before the choice of final solution different business areas need to pay attention how a product or service has been identified and understood. To do these next aspects should be covered in the analysis: which affect a price point, a cost structure, profitability and a delivery capability.

One question and challenge exist how to recognize all essential business cases, scenarios and external links connected with the project well enough? The danger is that the case will be seen too positively or negatively and it leads to the wrong final result of decision.

Second aim of the research was to define challenges that companies are facing related to the rapid productization. Empirical material was analysed to achieve this objective and rapid productization related challenges are summarized in Table 4.

Table 4. Summarizing the rapid productization challenges.

Sales

- There must be enough time to make an offer,
- Whether to use of 3rd party solutions,
- A mindset of sales should be in a solution offering and
- How to manage a local and a global portfolio.

Product data management

- Product code management.

Process and information sharing

- No as much time to make corrective actions as it is in NPD case,
- Is a customer ready for rapid productization itself
- Clear defined roles and responsibilities between different organizations,
- Communication between different organizations,
- How an organization structure can support at the same time both rapid and NPD productization,
- Resolution process within a streamlined organization structure: fast and right timing of decision making,
- All business processes are synchronized and
- A hand over mechanism from a rapid productization phase to a product management phase (business as a usually).

5 Conclusion

Companies have pressures to supply new products with increasing speed to the market. In addition, the nature of a product is changing in the traditional manufacturing industry where services and other intangible elements are responsible for a growing part of the profit. Increasingly, typical deliverables are mixtures of tangible and intangible elements, also referred to as solutions. Companies provide an increasing number of different solution variants to their customers, resulting in challenges in managing their product portfolios.

Rapid productization could be seen as a predictable process using a series of preplanned and well organized steps, which compress the time used in the productization process. The goals are 1) speed up a sales process with rapid offering which made able 2) to squeeze development time needed as much as possible. Position of a rapid productization is presented in Figure 8.

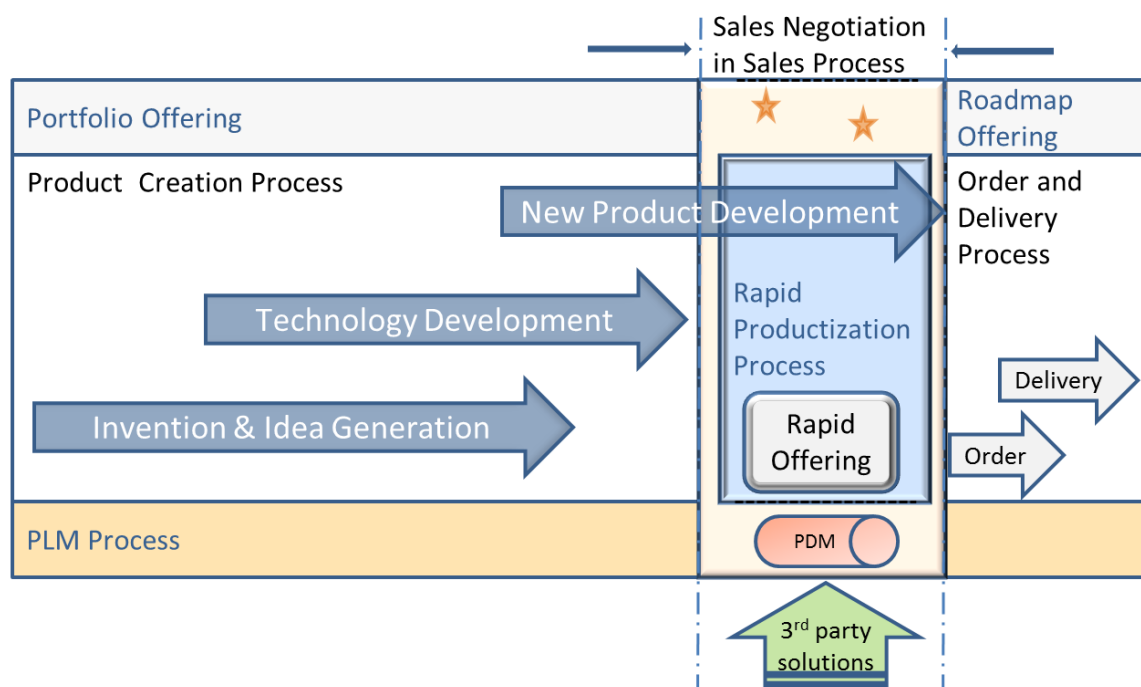


Figure 8. Big picture of the rapid productization.

The basis of productization is to understand customer needs and build a commercial solution which answers to this need, while creating profit for the company in question. It is also essential that the sales recognize when it's time for a rapid productization. Moreover, in rapid productization, a part of the solution is created in the sales, even though the solution mostly relies on existing products, modules, platforms, applications, solution blueprints, third party offerings and so forth. It is worth to mention that new product can be made as well removing some parts or features if it will better match the customer need.

In rapid productization no radical innovations are made, but a solution fit for customer specific needs is formed by combining the earlier mentioned pieces and adding some customized non-modules to the solution – this is done at the sales. Moreover, in rapid productization the complex solution, made of different parts, is productized into an easily sellable and understandable product. It is also important for sales personnel to be able to determine, for example, how far the customization should extend to so that it is still profitable and in line with product strategy, also what price should be asked.

Basic question is how to develop different functions involved so that they can recognize rapid productization possibilities better? Key questions to be answered during the sales situation will be:

- is it a global product for several customers or a local product for a single customer,
- who has a product management responsibility for during the life cycle of the product or service,
- what is estimated life cycle and
- what is delivery capacity and time?

Productization has many aspects, moreover many definitions. However, all definitions see productization to be the act of modifying something to become a commercial product. Thus productization includes the acts of defining; specifying and profiling, also concretizing was clearly a very important topic in productization. During the study, the vast role of marketing and sales organizations became evident, from the point of view of productization. The most important benefit from productizing is facilitated purchasing which of course ultimately leads to a more competitive business. The second most important one is the replicable process and structure which productization brings. It is important that needed analysis of rapid productisation and delivery capability estimation will be done through processes which are already in use. Next two alternatives from the interview present how to organize rapid productization in practice.

“There should be a separate team or organization unit for the rapid productization. The team or organization takes responsibility for opportunity market situation. That is how the case can be handled fast and complete if the case will be implemented”

”Rapid productization should be clearly separate from the implementation of our own products, without forgetting the common interfaces. Actual product developments should not be confused with the rapid productization process.”

In rapid productization, a part of the solution is produced during the sales process. Radical innovations are limited, because the solution is based on existing product portfolio, modules or platforms. The need for rapid productization arises from customer needs of quick delivery of end to end solutions. Solutions are built from many different functions and units – including hardware, software, integration, services, and third party products – it is important that the productization is done well so that the product is comprehensible and easily purchasable (Figure 9).

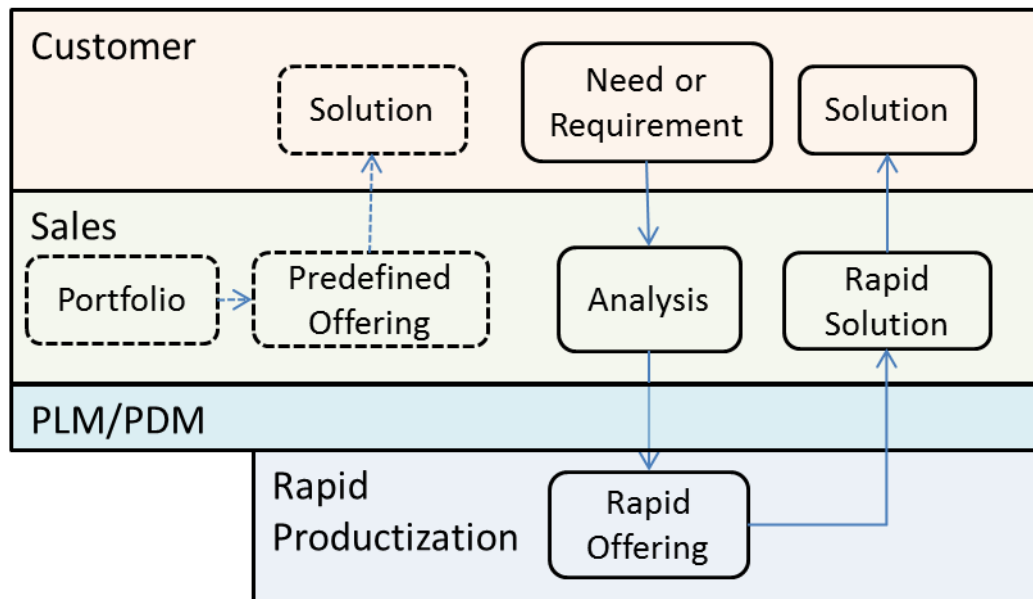


Figure 9. From a rapid offering to the customer solution.

As seen, the generation of the solution begins with understanding the customer need on top of which the solution can be built. Furthermore, keeping in mind the definition of productization, the whole process executed by sales is modifying something to become a commercial product. Thus all the actions are a part of rapid productization. Building the solution, in rapid productization, is done by combining modules, platforms, already existing products, non-modules, third party products, applications and other such. Thus it is clearly essential to understand the need of the customer, before a product fit to their specific needs can be built and productized. It was found that rapid productization can be further derived from modular and platform designs. **On the other hand, the sales situation can offer the channel also which can be used to develop its own supply.**

Rapid productization differs very much from traditional productization in the time-frame of the process and in the solution building process. Marketing however is similar, and similar tasks are executed in both. Although the marketing and external productization of solutions in rapid productization requires more effort as it is done in shorter time. In conclusion, the benefits of rapid productization are very similar to those of traditional productization; including facilitated purchasing, concretized product and structured, controllable products and processes.

As is already clear at this point, productization and rapid productization are heavily sales/marketing owned tasks. In an organization, sales and marketing understand the customer needs best – there is clearly need for quickly delivered end to end solutions. To be able to sell these solutions to customers in the rapid mean they wish, controlled process of rapid productization is essential. There is no time to start to develop new products from scratch. Rapid productization process helps the sales organization in selling the solutions. Also sales tasks like naming, pricing, creating feature list and brochures, communication of impacts etc. are included in the process of rapid productization – more precisely these are a part of the external productization.

”What is a relation with product databases between R&D and sales organizations? I can say that it is very weak. In practice, sales people need to create a solution using the elements available in sales situation. Service will be the

last part and be done last. We don't have a data system where all information link together."

Rapid productization, when the process is developed and fit to business specific needs, can give a structured process to sales and marketing. Structuring and systemization lead to, for example, efficiency, cost effectiveness, and shorter project cycles, all of which ultimately increases the competitiveness of the business. The structured way will also enable better control of products. In the solution selling business, and rapid productization within, one needs to be careful as to how many non-modules and how much customization is profitable.

Express product means that new products or services have been fully tested before they get access to the market. In NPD's case, it is common that the important phase of the work is just testing it, which has to be flexible in the end. Stretching time to be used for testing is not possible in a rapid productization. Next question presented in the interview:

"What is a role of productization if there will be only rapid productization? Is that the only way and there are no other alternatives?"

All in all, most advanced sales/marketing are already executing rapid productization at some level, without knowing it as the concept is unfamiliar. The aim of the rapid productization is in sales situation provide in a fast schedule the rapid offering which both parties accept. The initiation of the process of rapid productization is a customer requirement and the process ends with the solution provided for the customer by the sales.

In the process of rapid productization next phases can be identified:

- 1) Sales identify a customer need(s) or requirement(s)
- 2) Analyzing of the customer need or requirement starts,
- 3) Rapid offering,
 - a. How big the change needed is
 - i. What are different alternatives,
 - ii. Description of the rapid product/service and
 - iii. Creation of a product data needed for sales process
 - b. Who will be responsible for the product,
 - c. Work estimations and determination of the delivery capability,
 - d. Prize of the product or service,
 - e. Cost structure and
 - f. Analysis of profit and risks.

The process of rapid productization ends after the sales process has got the rapid offering. As a summary rapid productization means that **a part of solution is created during a sales process negotiation**. Radical innovations are limited because the solution is based on an existing product portfolio, platforms and/or modules. Cornerstones of rapid productization are:

1. A sales and productization process is under control.
 - Clear understanding what is a customer need on the top of existing offering.
 - Base on a portfolio, a platform and/or a modular/configurable product structure.

- Fast resolution process within a streamlined organization structure.
 - Work flow in a rapid and non-rapid productization and
 - Analysis, proposals and decision making.
- 2. Communication and information sharing is well managed.
 - Data must be correct and up to date and
 - Information must be in a right place at the right time.

5.1 Future research opportunities

As rapid productization is not even a widely known or established concept a lot more research is needed. Future research need includes testing of the concepts of rapid productization presented, further development of rapid productization and creating of a detailed process description of rapid productization. Also research about how to ensure that the products produced via rapid productization fit the product strategy of the company and that the products remain controllable is still needed. Moreover, other topics include differentiation of configuration of products and rapid productization.

In the sales situation

What kind of data a customer can or will provide at point of sales? What is the quality of the data and possible impact to an offering?

How well the customer data match to a product data needed for rapid productization? Can sales effect into quality of data?

From rapid productization to business as usual

How the management of company deal and transfer responsibility from the rapid productization to the normal delivery machinery. What does that mean in practice to the product, life cycle and portfolio management? Secondly, who is responsible for the rapid productization outcome after the actual productization? This involves a substantial question as to whether a rapid productization a one-time delivery, or whether it will be part of the company's product portfolio.

6 References

- Ameri, F. and Dutta, D. (2005) "Product Lifecycle Management: Closing the Knowledge Loops". *Computer-Aided Design & Applications*. 2 (5), 577-590.
- Artz, P., Weerd, I. and Brinkkemper, S. (2010) "Productization: The process of transforming from customer-specific software development to product software development", Department of Information and Computing Sciences Utrecht University, Utrecht, The Netherlands.
- Baldwin, C. and Clark, K. (1997) "Managing in an Age of Modularity", *Harvard Business Review* 75, no. 5, pp 84-93.
- Bonney, F.L. and Williams, B.C. (2009) "From products to solutions: the role of salesperson opportunity recognition", *Europe Journal of Marketing*, Vol. 43, No. 7/8, pp.1032-1052.
- Cooper, D. and Schindler, P. (2008) "Business Research Methods", The Tenth Edition. New York, McGraw-Hill/Irwin.
- Froza, C. and Salvator, F. (2008) "Application support to product variety management", *International journal of production research*, Vol. 46 Iss. 3 pp. 817 - 836.
- Gawer, A. and Cusumano, M. (2002) "Platform Leadership How Intel, Microsoft, and Cisco Drive Industry Innovation", Harvard Business School Press, Boston.
- Gebauer, H. (2010) "Service Business in Manufacturing Companies: Identifying Misconceptions and Directing Further Research", *Journal of Applied Management and Entrepreneurship*, July.
- Holma, T. (1998) "Tuotteistus tutuksi. Idea ja työvälineet. Esimerkkinä kuntoutuspalvelut perusterveydenhuollossa". Suomen Kuntaliitto. Helsinki.
- Huang, M.Y., Lin, Y.J. and Xu, H. (2004) "A framework for web-based product data management using J2EE". *International Journal of Advanced Manufacturing Technology*. 24 (11), 847-852.
- Huang, Y., Lui, H., Ng, W.K., Lu, W., Song, B. and Li, X. (2008) "Automating knowledge acquisition for constraint-based product configuration", *Journal of Manufacturing Technology management*, Vol.19 No. 6, pp. 774-754.
- Huhtala, P. and Pulkkinen, A. (2009) "Tuotettavuuden kehittäminen – parempi tuotteisto useasta näkökulmasta", *Teknologiainfo Teknova Oy, Finland*.
- Jaakkola, E., Orava, M. and Varjonen, V. (2009) "Palveluiden tuotteistamisesta kilpailuetuja", TEKES, Helsinki.
- Kasanen, E., Lukka, K., and Siitonen, A. (1993) "The constructive approach in management accounting research". *Journal of Management Accounting Research*, No. 5: 241-264.
- Kotler, P. (2003) "Marketing Management". The Eleventh Edition. Upper Saddle River, Prentice-Hall.
- Kurvinen, J. (2008) "Tuotteistaminen lisää kannattavuutta", Hämeen Yrityssanomien.
- Langlois, R. N. and Robertson, P. L. (1992) "Networks and innovation in a modular system: lessons from the microcomputer and stereo component industries". *Research Policy*, 21(4), pp 297-313.
- Lehtinen, U. and Niinimäki, S. (2005) "Asiantuntijapalvelut: tuotteistamisen ja markkinoinnin suunnittelu". WSOY: Helsinki.
- Martin, C. and Horne, D. (1992) "Restructuring toward a service orientation: The strategic challenges". *International Journal of Service Industry Management* 3, no. 1, pp 25-38.

- Meyer, M. and Lehnerd, A. (2000) "The power of product platforms", The Free Press, New York, NY.
- Okkonen, T. (1993) "Johdatus teollisuustalouden tutkimustyöhön". Report no 152/1993/Teta. Espoo: Teknillinen korkeakoulu.
- Ouertani, M.Z., Baïna, S., Gzara, L. and Moreld, G. (2010) "Traceability and management of dispersed product knowledge during design and manufacturing". Computer-Aided Design.
- Parantainen, J. (2008) "Tuotteistajan pikaopas 3.0", Noste Oy.
- Philpotts, M. (1996) "An introduction to the concepts, benefits and terminology of product data management". Industrial Management & Data Systems. 96 (4), 11-17.
- Rope, T. (2005) "Suuri markkinointikirja". Jyväskylä, Gummerus Kirjapaino Oy.
- Sanderson, S. and Uzumeri, M. (1990) "Strategies for New Product Development and Renewal: Design-based Incrementalism". Working Paper, Center for Science and Technology Policy, Rensselaer Polytechnic Institute, New York, U.S.A.
- Sanderson, S. and Uzumeri, M. (1995) "Managing product families: The case of the Sony Walkman", Research Policy 24 pp. 761-782.
- Simula, H., Lehtimäki, T. and Salo, J. (2008) "Re-thinking the product – from innovate technology to productized offering". Proceedings of the 19th international society for professional innovation management conference, Tours, France, June 2008.
- Sipilä, J. (1996) "Asiantuntijapalvelujen tuotteistaminen". WSOY.
- Strauss, AL. and Corbin, JM. (1998) "Basic of Qualitative research: Techniques and procedures for developing grounded theory", SAGE Publications, Inc.
- Sulaiman, R. (2000) "Change and delay". Manufacturing Engineer. 79 (3), 122-3.
- Suominen, A., Kantola, J., and Tuominen, A. (2009), "Reviewing and Defining Productisation" *The Proceedings of The International Society for Professional Innovation Management Conference: The Future of Innovation, Vienna, Austria, 21-24 June 2009*
- Ulrich, K. and Eppinger, S. (2008) "Product Design and Development". McGraw-Hill.
- Ulrich, K. and Tung, K. (1991) "Fundamentals of product modularity", Issues in Design/Manufacture Integration, pp 73-79., New York, U.S.A.
- Valtonen, J. (2007) "Suorituskyvyn johtamisen asiantuntijapalvelun tuotteistaminen", Lappeenrannan teknillinen yliopisto.

7 Appendix: English version of the questionnaires

7.1 Appendix A: Interview form (August/2011)

Charting of the backgrounds of the sales situation

- What kind of a product/ the service wholeness is in the company sold?
- What is a typical sales situation like?
- How is the portfolio managed in a sales situation – how is the sales item put together?

Challenges caused by the new demand in the sales situation

- Do customers ask often for such one which is not available?
- Describe what are these requests from the customer's typically like?
- What kind of challenges do these requests cause the sales people?
- How can the challenges be met in the sales situation?
- Can the possibility of the rapid productization be identified in the sales situation?
- How would you develop the operation of your company so that the possibilities of the rapid productization would be better identified?

The continued process of analysis, the analysis of demands and the resolution

Has been in the sales situation in which the product portfolio does not correspond to the customer's needs, the normal product development project is not satisfied with the time but the equivalent of the customer demands / needed to the customer's need fast.

- Tell how it is acted in your company in this situation?
- Who participate in the analysis of customer demands?
- How will already existing product data be utilized at the analysis stage?
- How long does the analysis of customer demands typically take?
- Who participate in the putting together with the proposed solutions?
- What stages are needed for the making of the proposed resolution?
- How could it accelerate the doing of proposed resolutions?
- What product and life cycle data has the proposed resolution at least to contain?

- How are the following sectors estimated at the point of proposed resolutions
 - profitability?
 - delivery capability?
 - risks?
 - life cycle management?
 - compatibility with the product portfolio?
 - the point of view of a portfolio?
 - the point of view of business strategy?

Process of rapid productization

The following questions concerned the process of the rapid productization at a general level as a one of the business processes of your company.

- What stages belong to the process of rapid productization?
- What are critical factors of the process rapid productization?
- What are the main challenges of the rapid productization in your company?
- What kind of product structure supports the rapid productization?
- How would you improve the rapid productization?
- What do the following concepts mean?
 1. Productization,
 2. Variation and
 3. Tailoring?
- Are there other comments related to the rapid productization?

Directing of the project of RapidPRO

- What does the definition of the project “*product data challenges in rapid productization at the point of sales*” mean?
 - Are the 1) order which takes place after the sales, 2) implementation and 3) delivery also to the scope of the project included and what it means in the case of your company?
- How is the change taken care of in a big company?
- What do you understand about the business case?

- What matters would be worth we clarify, in your opinion, from other firms which participate in the mind of benchmarking?
- Are there other matters what would be worth clarifying in your opinion?

7.2 Appendix B: Interview form (November/2011)

From sales to rapid productization

Background: During sales situation company's product portfolio does not meet customer requirement(s). As there is no time for normal productization sales has identified an opportunity for rapid productization.

- K1 How is the product portfolio managed during the sales situation – how is a sales item formed?
- K2 How is a rapid productization process initiated during the sales situation?
- K3 What kind of analysis is required when deciding whether productization is conducted for a single customer, or whether it becomes a part of the existing product portfolio?
- Who will make the decision?
 - How does the decision influence the ownership/responsibility of productized product?
- K4 What information needed to start the process of rapid productization?
- From a customer/client?
 - From sales?

The process of rapid productization

- K5 What are the phases the rapid productization process consists of?
- K6 What decisions are made during rapid productization process?
- K7 Who are the person/roles required during each phase?
- K8 In which organizational units are these roles located in? In other words, what are organizations involved in rapid productization?
- K9 What are the tasks the involved persons/roles will perform?
- What documents, plans, analyses, etc. are produced?
- K10 Once a solution for rapid productization is available - What kind of information is needed for the sales process to continue?
- K11 What type of challenges is experienced in relation to rapid productization?
- K12 How would you improve the process of rapid productization in your company?

From rapid productization to business processes

Background: Rapid productization has been made and delivery has been agreed with the customer.

- K13 Which company functions and organizational units (business processes) require information on rapid productization?

- K14 What are the challenges currently experienced with regards to product data in relation to rapidly productized products?
- K15 Who will take the ownership (responsibility) of an individual client's productized product? What about if the product will be a part of the product portfolio?
- K16 When can one say that the rapid productization has been successful from the view point of?
- a. Sales,
 - b. Customer/Client,
 - c. Your,
 - d. Organization responsible for productization, and
 - e. Product management point of view?

Oulun yliopisto
Teknillinen tiedekunta /
Tuotantotalouden osasto
PL 4610
90014 Oulun yliopisto

tel: +359 (0)8 553 2936
fax: +359 (0)8 553 2904

ISBN 978-951-42-9813-4
ISSN 1459-2401

www.oulu.fi