



Kai Hänninen, Tuomo Kinnunen, Matti Muhos and  
Harri Haapasalo

# Delivery Capability in Rapid Productisation

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

Rapid productisation introduces a strategic approach to company management, which will help companies focus their productisation efforts in order to increase their return on development and become more competitive. Rapid productization is a mode of operation which creates a field for faster response for a customer demand than with “a standard” productization is able to achieve. On the other hand rapid productisation process creates disruption into an organisation. Rapid productisation as a framework is a way to fix the portfolio shortage whatever the reason behind for it is. Use of rapid productisation framework is not needed if predefined offering (a portfolio) match in sales situation to the customer’s demand.

During a business case analysis phase a company need to decide whether there is possibilities to response or not to the customer’s demand and make a rapid offer for a new product or service. Business case analysis is a key stage and it is not fast if the rapid productisation process requires a data collecting far too detail level. One way to speed up the analysis is 1) limiting a number of used interfaces’ 2) do less unnecessary paper work and 3) throw away routine meetings. This will boost the rapid productisation start up and streamline running of whole process.

Rapid productisation is an exception and it a company need to differ from an approach they normally use. If rapid productisation process will be handled like a basic productisation process there are no possibilities to get any improvements like faster throughput. One important target of rapid productisation process is to use less or minimal engineering work (manpower) and have predictable delivery than most of productisation cases in general. That advantage will be losing if the process itself is not steamed compare to basic productisation process.

Main point in rapid productisation is to ensure that all necessary sales and R&D interfaces will get the information. In other words make sure that only absolutely needed organisations units and roles will be involved and those got information of new productised product. In minimum decision to start a rapid productisation should be able to make within minimum participant from sales, R&D and company’s management team.

A goal of rapid productisation process is to define whether a business exists and at the same time delivery capability can be achieved in able to make rapid offering. As a result of this study, fast track 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 productisation seeks to add value to a company in sales negotiation.

*Keywords:* Rapid productisation; productisation; delivery capability; sales-R&D cooperation; product life cycle management; PLM; product management

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

Julkaisu- ja toimikunta, Oulun yliopisto, PL 7500, 90014 Oulun yliopisto  
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## **Tiivistelmä**

Tämän Nopea tuotteistaminen on yrityksen johdolle strategisen työkalun, jonka avulla yrityksellä on mahdollisuus reagoida nopeasti myyntitilanteessa esiin tuleviin uusiin asiakasvaatimuksiin. Nopea tuotteistaminen auttaa keskittämään tekemistä oikeisiin asioihin ja näin ollen savuttamaan paremman tuottavuuden. Toimintamallina nopea tuotteistaminen antaa mahdollisuuden vastata nopeammin asiakkaan vaatimuksiin, kuin mitä olisi mahdollista perinteisen tuotteistamisen avulla. Toisaalta nopea tuotteistaminen saa aikaan häiriötilan yrityksen toiminnassa. Nopea tuotteistaminen mahdollistaa portfolion puutteiden nopean korjaamisen myyntitilanteen aikana. Mikäli myyntitilanteessa tuote- tai palvelutarjonta vastaa asiakkaan toiveita on selvää, ettei nopeaa tuotteistamista tarvitse käynnistää.

Lähtökohtaisesti asiakkaan vaatimus pitäisi olla toteutettavissa kannattavasti. Nopean tuotteistamisen kohdalla myös muut perusteet voivat tulla kysymykseen. Kannattavuuslaskennan onnistuminen nopealla aikataululla on koko hankkeen tärkeimpiä vaiheita. Nopeus ei toteudu, jos tietoa joudutaan keräämään liian perusteellisesti. Kannattavuusanalyysiä voidaan nopeuttaa, jos 1) rajoitetaan hankkeeseen osallistuvien lukumäärää, 2) vältetään ”turhaa” paperien kierrätystä ja 3) poiketaan totutuista rutiini prosesseista. Näin menetellen nopea tuotteistus saa nopean alun ja se vauhdittaa koko prosessin etenemistä.

On tärkeää muistaa, että nopean tuotteistamisen prosessi on poikkeus tila ja sen käyttäminen vaatii kykyä hylätä tutut käytännöt. Tutkimuksessa on selvinnyt, ettei nopea tuotteistaminen ole mahdollista turvautumalla pelkästään perinteisiin tuotteistamisen menetelmiin. Nopean tuotteistamisen tavoitteena on käyttää mahdollisimman vähän perinteistä insinööriä ja ennustaa tarkasti toimitusaika mikä ei ole itsestään selvää perinteisiä tuotteistamistapoja käytettäessä. Nämä edut menetetään myös nopeassa tuotteistamisessa, jos käytössä on vain perinteiset hyväksi havaitut menetelmät.

Erityisen tärkeää nopeassa tuotteistamisessa on varmistaa, että myynti ja tuotekehitysorganisaatiot saava käyttöön kaiken tarvittavan tiedon. Nopean päätöksenteon edellytys on rajata hankkeeseen osallistuvien lukumäärää. Tämä tarkoittaa, että hankkeeseen osallistuu pieni joukko myynnistä, tuotekehityksestä ja yrityksen johdosta.

Nopean tuotteistamisen tavoitteena on selvittää hankkeen liiketaloudellisuus ja se, että tuote tai palvelu on mahdollista toteuttaa asiakkaan toiveiden mukaan halutussa aikataulussa ennen lopullisen tarjouksen tekoa. Tässä tutkimuksessa on kehitetty nopean tuotteistamisen toimintamalli. Yritykselle tämä tarjoaa mahdollisuuden lisäarvon luomiseen myyntineuvottelujen aikana ja samalla kehittää organisaation toimintaa.

*Avainsanat:* Nopea tuotteistaminen; tuotteistaminen; toimituskyvykkyys; myynnin ja tuotekehityksen välinen yhteistyö; tuotteen elinkaaren hallinta; PLM; uuden tuotteen kehittäminen; tuotehallinta

# Contents

Abstract	1
<b>Contents</b>	<b>3</b>
<b>1 Introduction</b>	<b>4</b>
<b>2 Theoretical Background</b>	<b>6</b>
2.1 Sales-R&D cooperation	6
2.2 Product variety	6
2.3 Strategy orientation	7
2.3.1 Market orientation	7
2.3.2 Technology orientation	8
<b>3 Research Process</b>	<b>9</b>
<b>4 Results</b>	<b>11</b>
4.1 Rapid productisation process	12
4.1.1 Roles and responsibilities	14
4.1.2 Main process phases	15
4.1.3 Preconditions	16
4.1.4 Existing portfolio support	17
4.1.5 Business case	17
4.1.6 Creating of delivery and sales capability	18
4.1.7 Hand over and order fulfilment	19
4.2 Sales-R&D cooperation in rapid productisation	20
4.3 Summary	23
4.3.1 Fast track	24
4.3.2 Challenges and improvement in sales-R&D cooperation	24
<b>5 Conclusion</b>	<b>28</b>
<b>6 References</b>	<b>31</b>

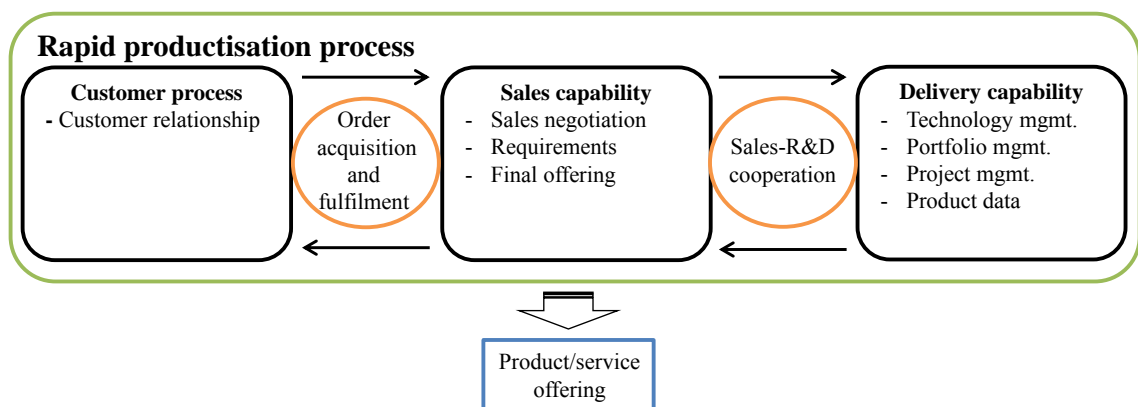
# 1 Introduction

This report is a continuation of a rapid productisation study started in 2011. Earlier research focused to study what are rapid productisation preconditions and challenges. In this study a focus is in cooperation between sales and R&D needed to run through a successful rapid productisation process.

In a modern enterprise, quick decisions are often required at the point of sales. There is a need to productise new product or service items to address customer preferences. Making decisions in a sales situation is demanding and challenges occur in order to make reliable and reasoned productisation and to be able to manage the solution during the lifecycle (Hänninen et al., 2012).

Rapid productisation process (Figure 1) provides an answer to support controlled framework how to fast create a rapid offering in the sales situation. The rapid productisation framework contains next phase 1) **Customer process**; take care of a customer relationship, 2) **Sales capability**; in sales situation a business case analysis and framework to quickly estimate the possibility for rapid productisation, 3) **Delivery capability**; analysis of delivery capability including a specification and a development plan for the *rapid offering*. Outcome of rapid productisation process is 4) **Offering**; a solution (a product/service) finalised by sales. It is important that new product items which are productised rapidly will fit in a company's product strategy and are also controllable. The rapid productisation is not meant for developing radical innovations but to create items to complement the existing product portfolio (Hänninen et al., 2012).

Secondly rapid productisation challenges and preconditions were defined. They can help business managers to understand the framework of rapid productisation as a whole. Rapid productisation is not needed if the product or service as such can be made e.g. by configuring it immediately in the sales situation. Key challenges and preconditions are presented in **Table 1** (Hänninen et al., 2012).



**Figure 1.** Rapid productisation and its sub-processes

**Table 1.** Key challenges and preconditions in rapid productisation

<b>Challenge</b>	<b>Preconditions</b>
How to correctly understand, identify and document customer preferences right from the beginning?	Defined rapid productisation framework, roles and responsibilities.
How to ensure fast turnaround time for a specification and a development plan?	Predefined, fast and right timing of decision making.
How to maintain a unified information system?	Rapid offering must fit with an existing portfolio.

According to Zorzini et al. (2012), high levels of coordination at customer enquiry stage and formalisation of customer enquiry management (CEM) process, have a positive impact on company performance.

Based on e.g. Baker and Sinkula, 2007 and Davis et al., 2010 most studies are linked between R&D and marketing cooperation (RMC) and new product success (NPS) to take the three elements of market orientation as a single concept.

Teamwork and cross-functional cooperation, especially cross-functional cooperation between R&D and marketing departments, is one of the most critical factors influencing innovation and NPS (Atuahene-Gima and Evangelista, 2000; Song et al., 1996). Effective RMC can improve innovativeness and NPD quality (Olson et al., 2001; Shaw et al., 2004). The purpose of RMC is to allow different departments to act quickly and effectively on changes in market demands and customer needs (Kohli and Jaworski, 1990).

Earlier research has identified the integration of marketing with research and development (R&D) as a key success factor for new product development (NPD). However earlier work has not distinguished the sales and marketing functions, even though they are distinctive departments within an organisation (Ernst et al., 2010).

Ernst et al., 2010 also found that sales–R&D cooperation had no impact on new product performance at the implementation stage. However, this cooperation could be important for a few specific industries (especially those that involve complex and technical products). In these specific cases, R&D may need not only to support customers directly but also to educate the sales force in terms of technical details to allow them to provide better support to customers. Therefore, managers should understand that integration of sales into the NPD process is an effective way to bring the “voice of the customer” into the firm (Ernst et al., 2010).

The aim of this research is to identify process for providing rapid offering to customer request. Secondly this report studies what kind of cooperation is needed between sales and R&D to support creation of delivery capability in the sales situation. The research investigates the characteristics shown by companies who provide products or services to business markets. The report analyses the organisational, informational and decision-making elements that support rapid productisation process.

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

- 1) What kind of process supported rapid productisation and
- 2) What does delivery capability mean in rapid productisation?

## **2 Theoretical Background**

### **2.1 Sales-R&D cooperation**

Based on Ernst et al., 2010 the cooperation between sales and R&D and between sales and marketing has a significant positive effect on overall NPD project performance beyond marketing-R&D cooperation. Sales-R&D cooperation in concept and product development stages is critical for greater new products success. Sales-marketing cooperation is important in the concept development stage but has surprisingly less impact in the implementation stage (Ernst et al., 2010).

Because the results show that sales–R&D cooperation is critical for NPD performance, we conclude that prior empirical studies on cross-functional integration have ignored an important contributor to new product success by subsuming sales and marketing broadly under the term “marketing organization.” In contrast, the findings indicate that sales can make important contributions to NPD when interacting with R&D. Therefore, the sales function should receive distinctive attention in further NPD research (Ernst et al., 2010).

### **2.2 Product variety**

In an attempt to better respond to customer needs, many companies increase their product variety. Believing to better match the product offering with customer needs, companies see increasing product variety as an avenue to maintain, or even improve, market share. Nevertheless, there is a potential trade-off between product variety and operational performance (Salvador et al., 2002).

Product variety can cause difficulties in terms of operational efficiency. Increase in design workload due to the development of abundant new product variants. Rationalising product structure, for example through modularisation, is one way to tackle the challenges caused by increased product variety. Hofer and Halman (2004) propose the use of layout platforms, i.e. standardised arrangement of subsystems within the product family, for reducing product variety related complexity. More variety means more difficulties for a customer to choose what would be the most suitable product features and that is why more information exchange is required. Also collecting, storing, and processing the information that describes customer orders becomes challenging. It is why more tools required for managing the information meaning 1) translation between commercial language and 2) product documentations for manufacture etc. (Hofer and Halman, 2004).

In a business-to-business environment, increase in product variety may be a result of; a) the need to respond to customer requests by continually developing and expanding the product offering, and b) the need to provide complete solutions to customers (Bramham et al., 2005).

Should a company allow uncontrolled product proliferation; the order acquisition and fulfilment process can become a serious bottleneck, while the increase in product features causes exponential growth in the amount of information exchanged between sales, customers, and production during the order process. Many businesses operating in industrial markets are adopting product configurator technologies to process customer requests for a broad range of product variants (Salvador et al., 2002).

Companies utilise product configuration systems to act as an organisational memory for product knowledge. Product configuration systems may even influence the way a company organises its order acquisition and fulfilment activities.



Unfortunately, due to the variety of different solutions, it may be difficult to understand how these systems really support a company in managing its product variety (Forza and Salvador, 2008). The use of modern information technologies is seen to enable integrating customers into value creation during the course of product configuration and product specification (Piller et al., 2004).

Product configuration systems do not necessarily provide adequate support for decision burden arising from product variety as businesses are reliant on many informal practices and are strongly people intensive (Bramham et al., 2005).

Furthermore, information has to be fed back in appropriate formats to manufacturing, with the risk of errors and delays due to the variability and complexity of product information. During an order acquisition process, sales, with the help of technical staff, have the task of guiding customers towards product attributes that are coherent and compatible with company's existing product range (Hofer and Halman, 2004).

An error generated during a sales interview can easily escalate to such amplitude that the company end up in a constant fire-fighting mode and is left with limited time to rectify the product documentation that caused the problem in the first place. When dealing with a high product variety, sales typically has to consult technical staff while assessing order feasibility. This may lead in long delays in order acquisition. Misunderstandings between sales and customers, or inability to translate custom requirements into a product attribute can lead to configuration errors (e.g. Pringle, 2001).

Previous research is lacking in discussion on managing variety at the business front-end that involves significant customer interaction, resulting in product specification and quotation. It is possible that a company receives product requests that are outside the regular product range, ones that are not described by company's product configuration system. These potentially non-standard products may require a cooperative response from sales personnel and technical staff (Bramham et al., 2005).

If willing to consider such requests, a company must be able to provide reactive decision making to consider the implications of modifications to existing product variants. This type of situation, triggered by a non-standard request, necessitates for mechanisms to provide rapid effective quotations, and capabilities of identifying any constraints preventing a company to tender (Bramham et al., 2005).

## **2.3 Strategy orientation**

### **2.3.1 Market orientation**

Brem and Voigt (2009) summarise the market pull to be "characterised by unsatisfied customer that creates new demand, which requires problem solving". The impulse comes from individuals or groups that state their demand; this impulse is then used for focusing company targets, resources and activities so that this demand can be satisfied. Day (1994) lists the market-driven company features to be a set of beliefs that puts customer's interest first, ability to generate and use information about customers and competitors, and the ability to coordinate resources for customer value creation.

Day (1994) also adds that market orientation represents superior skills in understanding and satisfying customers. According to Day (1998) market driven companies know their markets deeply so that they are able to identify valuable customers. Thus these companies are able to make strategic choices and implement

those consistently. These choices can be e.g. prioritization of customer requirement in the favour of most valuable customers or the service levels of which are offered. According to Day (1998) the characteristics of market driven organizations following market oriented strategy can be listed as follows: offering superior solutions and experience, focus on customer value, ability to convert customer satisfaction into loyalty, drive to energize employees, anticipation of competitor moves by intimate market understanding, viewing marketing as investment and not as costs and leveraging brands assets.

### **2.3.2 Technology orientation**

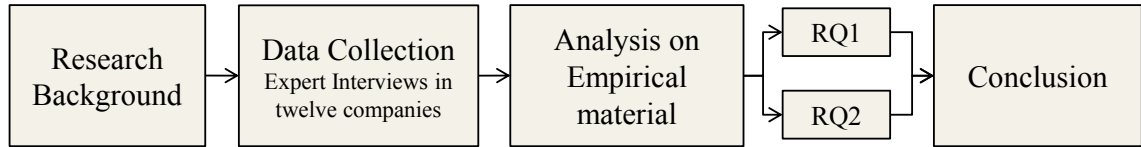
Technology push is a term used for the approach in which the technology innovation is pushed to the market starting from internal development via production to marketing function. In the 'market pull' approach in the other hand the signal for development starts from the expressed market need (Martin, 1994).

Due to nature of this approach, the technology orientation in strategy, pushing new technology to market and customers, which has not expressed explicitly its demand for such technology, creates greater uncertainty for success in the marketplace. Technology orientation characteristics are large research and development investments, drive for big leap in the technology development, long term focus and duration of development projects. Also not only there is uncertainty of the market demand, but also about the technology itself, its feasibility and maturity (Lynn and Heintz, 1992; Hamel and Prahalad, 1991; Scouder, 1989).

According to Walsh et al. (2002) technology push strategy can be based both, on the company's internal competences, or on the external signal of disruptive technology.) The internal development can lead to new technology or major improvement of existing one, technology push originated from external source leads to creative destroying of old technologies. Overall, the technology oriented strategy wants to create competitive advantage from the technology advancements and from the adoption of new technologies (Chau and Tam, 2000).

### 3 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.



**Figure 2.** Research process

The empirical study consists of semi-structured industry interviews. The research process is described in Figure 2. The interview questionnaire was formulated based on the research background. 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 46 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 14 companies see in Table 2. 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 2.** Company characteristics

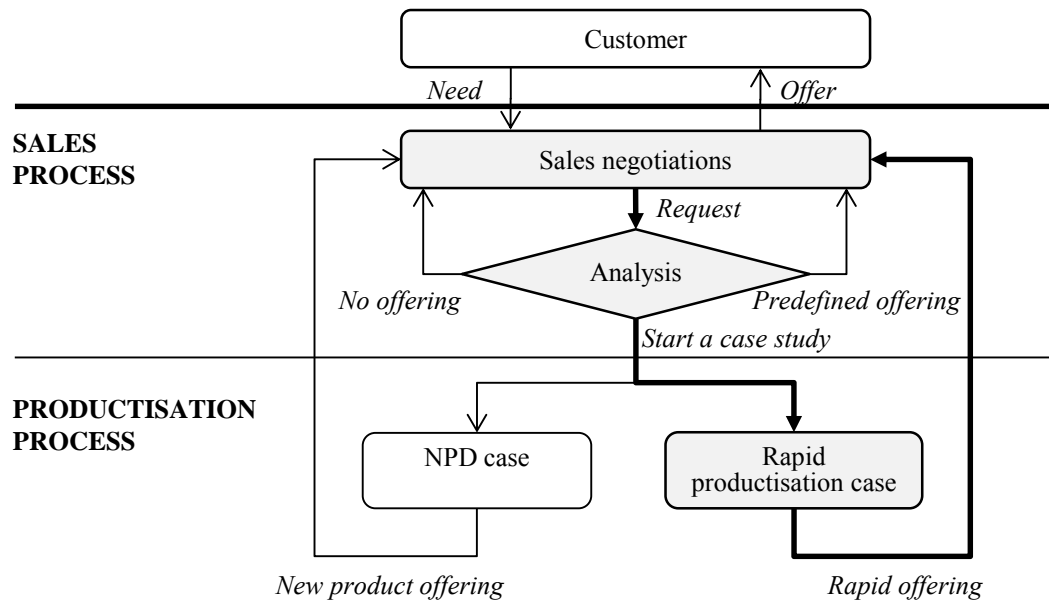
<i>Key Characteristics*</i>	<i>Interviews</i>	<i>Area of product or service business</i>
Large	1	Telecommunication
Large	5	Product manufacturing and service
Large	2	Joinery
Large	11	Data networking and telecommunication
Large	6	Business and technology service
Large	5	Telecommunication
Large	1	Business and telecommunication service
Medium-sized	4	Metal machinery
Medium-sized	2	Contract manufacturer in food industry
Medium-sized	2	Health care provider
Medium-sized	1	Contract manufacturer in sheet metal engineering
Medium-sized	2	Forest and agriculture machinery
Medium-sized	1	Product life cycle management
Micro	3	Consulting

*\*Company size classified according to EU Commission definition (2005) SMEs (1-249 persons employed); micro enterprises (1-9 persons employed); small enterprises (10-49 persons employed); medium-sized enterprises (50-249 persons employed); large enterprises (250 or more persons employed).*

## 4 Results

Creating new value is essential for growth and profitability in all business sectors. In order to survive and remain competitive, companies must constantly develop to introduce new products, services, processes, or business models which generate new value. Rapid productisation offers a framework to continue sales negotiations in a situation when company's product portfolio (*predefined offering*) does not meet customer need (Figure 3). Rapid productisation as a well-managed framework may provide a true competitive advantage for companies. It is beneficial when a company has strong business reason, to serve customers and make a solution rapidly despite the fact that the existing portfolio does not provide a satisfactory solution for the customer.

Rapid productization is **a mode of operation** which creates a field for faster achievement for a customer demand than with "a standard new product development" (NDP) productisation is able to achieve. On the other hand rapid productisation process will create unwanted *disruption* into an organisation. Rapid productisation as a framework is a way to fix the portfolio shortage regardless what the reason is behind the portfolio limitation.



**Figure 3.** Sales analysis phases

As a starting point, the sales team can offer a customer a whole range of products and services based on the existing portfolio (*Predefined offering*). Challenges appear in case when the portfolio and the customer need will not match while the company has strong business reasons to provide a new product or service item (*Start a case study request*). Response to the case study request is not possible to make if portfolio changes are not allowed. However, it must be understood that rapid productisation cannot be an automatic response to be used for solving all kind of customer preferences. Rapid productisation is not meant for developing radical innovations but to create items to complement the existing product portfolio (*Rapid offering*). That is one reason why in rapid productisation, totally new products or product segments cannot come to question (*New product offering*). Characteristics of rapid productisation are presented in Table 3.

**Table 3.** Rapid productisation characteristics

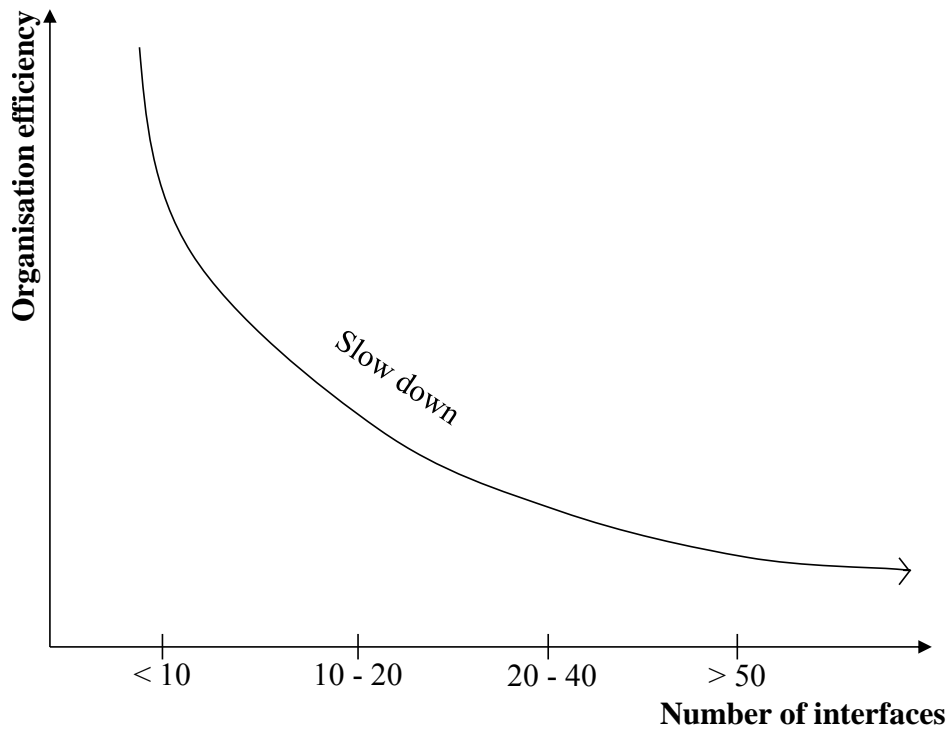
- 
- Starts from a customer input,
  - Sales driven process,
  - Lower investment needed,
  - Requires minimal engineering effort,
  - Shorten development cycle (Rapid productisation < NPD),
  - Short term planning and budget period and
  - Very predictable delivery time.
- 

#### **4.1 Rapid productisation process**

As said in the interview “*generally speaking, no matter is it rapid productization or just so-called normal productization, the same organizations parties working in product or service making need to know what is happening*”. Basically, how the information itself is flowing through an organisation is a different thing. Based on an interview data it is clear that large companies use to have more process interfaces linked into productisation work. Base on the study the more interfaces a company have it will slow down rapid productisation capacity. At the same time it will mean speed down of information sharing and decision making. That is one identified area which will need a change to be more agile (Figure 4).

Traditionally a sales-R&D cooperation means a work with wide group of different company functions like: acceptance, accounting, capability planning, customer team, delivery, design, implementation, invoicing, logistics, management, manufacturing, packaging line, procurement, product installation, product management, production, production planning, purchasing, sales team, supply chain, testing and transportation etc.

We can ask is it the best way to share information to all in the company? Is it essential important that all parties and units will know that is on-going? In rapid productisation this is not the case. Main point in rapid productisation is to ensure that all necessary sales and R&D interfaces will get the information. In other words make sure that only absolutely needed organisations units and roles will be involved and those got information of rapidly productised product. In minimum decision to start a rapid productisation should be able to make with minimum participant from sales, R&D and company’s management team.



**Figure 4.** Impact of internal interfaces to slow down capacity

This guidance is not against any other announcement practise the company has like “*share information to all employees*” policy. Once a responsible person has been nominated in rapid productisation he or she needs to ensure correct information sharing to all whom might need it.

In sales situation there is a new customer request for a product, a service or a solution. Rapid productisation process can be started in case sales see a business opportunity for it and a delivery capability process can be initiated. In able to be successful delivery capability process will need a customer’s preferences and a real customer needs (requirements). Sales need to ensure common understanding of a new product or service to be able to transfer that information to the delivery capability process. An initiation request of new product or service is based on a customer’s idea and it will need further analysis before the final sales decision (delivery and sales capability) can be made. In a basic case the customer define what kind of preferences they have for new product or service. Sales will continue negotiations and more detail technical planning with the customer and the R&D unit. Main goal of rapid productisation process is create a rapidly an offering which the customer wants to have. A list of process related quotations from the interview is presented in Table 4.

**Table 4.** Quotations from the interview – “Process”

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*“Company does not have rapid productisation process for a product but instead it is for a solution.”*

*“But, generally speaking, cooperation over different organisation units or borders is working quite well. They are not thinking that that person is from the different organization and I do not need to take care of that person. I’m just focusing on my own work which is landing on my table attitude is not common. But of course then there are maybe more challenging teams or more challenging individuals in big company like we are. But generally speaking, I would say that the cooperation between the different organization borders is in good shape.”*

*“In a company there is not only one way how to do things even a common processes exists. Different units might have its own way of applying company guidance.”*

*“In practise too tight process guidance and follow-up from company’s management might limit practical work. In rapid productisation view point a semi-official process model could work better where fast decision making and response to a customer preferences is essential.”*

*“How to get things happen fast? Process view point there is no check points which can be bypass – that is also challenges. Nature of rapid productisation requires a use of short cut. From organisation view point this is one of the key issues to be handled if a target is speed up rapid productisation and sales-R&D cooperation.”*

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#### **4.1.1 Roles and responsibilities**

As a starting point a customer has a business need(s) (demand) where a company try to answer. Sales should have clear understanding what the customer preference is. In some cases a market analysis could be used as a backup. The preference list from the customer will be a base information set to be used for several type of analysis needed during the rapid productisation process. It is normal that the customer preference will process during a negotiation phase. Depending what is a gap need to be fulfilling several organisation units and roles will work together and draft specifications.

Well defined roles and responsibilities ensure a fast and smooth process throughput. Clear responsibility area definition covering all rapid productisation phases is essential to avoid overlapping work. Authority to make needed decisions and responsibility must be hand-in-hand.

Who can and will make business decisions’ regarding rapid productisation varies by intervened company. Decision making authority could be in top management or it could be passed to a middle management level. Typically in SME’s decision are made by top management (CEO, EVP, VP or executive level) and in large companies decision making authority is in lower organisation tiers (director or management team level).

Rapid productisation is sales driven process meaning that sales organisation is sitting on a driver seat. Sales organisation must nominate one responsible person who is conducting the orchestra. Project organisation must be kept flat in order to avoid too many different players involved into loop of rapid productisation. Information handling and management during rapid productisation requires extra attentions from all parties involved.

All working in rapid productisation process should be aware of: 1) who could initiate a rapid productisation process, 2) which are persons and 3) organizations units involved in order to get the process fly. There is, based on interviews, definitely a room for simplicity.

Build up a delivery capability plan is the most important task to in rapid productisation. Essential part of building delivery capability is checking not only headcount but also availability of needed competences for rapid productisation. Also cooperation with a purchase organisation is critical able to define advance lead



time challenges. A list of roles and responsibility related quotations from the interview is presented in Table 5.

**Table 5.** Quotations from the interview – “Roles and responsibilities”

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*“Human nature is strange and it is not easy to change things what we are using and used to. Main challenges I see is how to constantly and objectively evaluate on-going processes, trigger out problem areas and fix them.”*

*“Try to avoid “a grey areas of organisation” where is not defined clear responsibility areas.”*

*“There is no clear responsibility what so ever and a ball will be kicked to somebody else meaning - It is not my business.”*

*“In a service business big challenge is a shortage of time for creating a tender. It is common that each customer tender case is bit different and use of strictly a same process will not work as such. That is why a use of common sense, tactic knowledge, and process variations exists in rapid productisation phase. That can be seen for example lack of written guidance and person must know to whom take contact when is need for process related information.”*

*“Rapid productisation requires more work from everybody in the process chain. From PDM point of view there are two key roles running rapid productisation. Roles are responsible for a product reference items are productised correctly into our systems.”*

*“An organisation which I know and it is the closest linked to rapid productization has well defined rules. There is a clear responsibility definition between main interfaces. Also they have very good competencies and key players understand what the importance of the well done productization is. That is why the whole rapid productisation process flows end to end.”*

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#### **4.1.2 Main process phases**

A trigger to start a rapid productisation process could come from several different sources like: 1) directly from an end user, 2) from a b-to-b customer during on-going sales negotiation, 3) by a tender received from a customer, 4) from an after-sales-network (new requirements, an idea), 4) from an authority (new regulation), 5) pop upped quality or safety issue, 6) by analysing competitor’s products again existing portfolio (price or features) or 7) by a R&D unit inventing new product, service or solution. There are a lot of different reasons behind each trigger. Summary of rapid productisation phases is in Table 6.

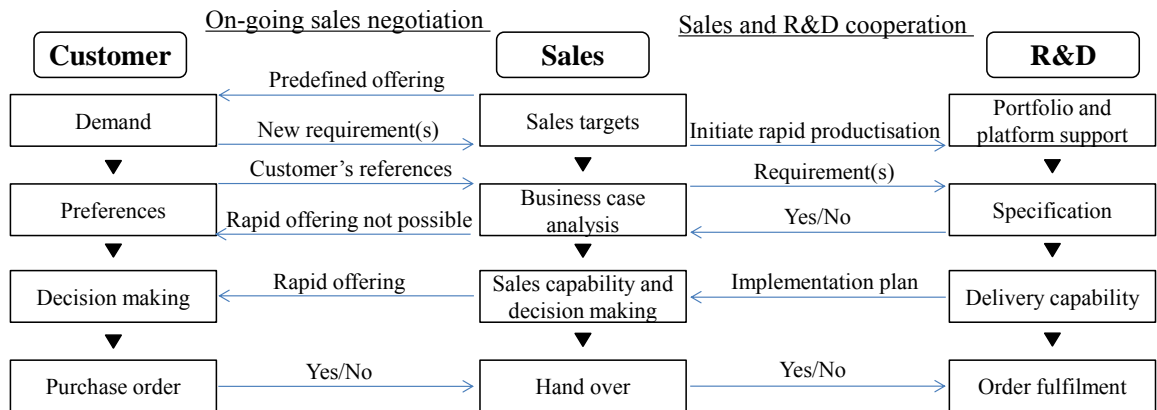
**Table 6.** Summary of rapid productisation phases

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- On-going sales negotiation
  - New preference(s) from a customer
    - A need definition
- Planning and capability study
  - Portfolio and platform support
  - Requirement specification
  - Design and specification
  - Project plan and schedule
  - Sales and delivery capability
- Making a business decision
  - Target setting
  - Business case analysis
    - An economical aspect and a cost calculation
- Hand over
  - Delivery organisation start implementation
    - Order fulfilment

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Counterparties in rapid productisation process are a **customer** (need something new), **sales** organisation (fulfil company’s sales targets) and **R&D** (owner of create process and provide technical support) organisation. Main activities between a customer, sales and R&D are presented in Figure 5.



**Figure 5.** Activity diagram of rapid productisation

#### 4.1.3 Preconditions

Sales organisation performs sales targets set by company management. A customer is not happy with predefined offering promoted by sales. During the negotiation the customer presents new requirement(s), need, request or demand. This is new situation and actions needed by sales before sales negotiation can be continue. An initiation of rapid productisation process will be made by sales responsible. A create process can be started. It is important that company’s strategy will support itself a mode of rapid productisation. A list of precondition related quotations from the interview is presented in Table 7.

**Table 7.** Quotations from the interview – “Preconditions”

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*“Does sales team really understand what they are selling? Basically when a need for rapid productisation arises it means automatic that there is a gap in company’s product or service offering. This should ring a bell in sales.”*

*“Sales items will be done in projects and that is why I am not only speaking from a product view point. In the fact what we are doing is a project and we are selling outcome of the project. Question to be asked is should a productisation done just from sales point of view?”*

*“Time to time challenges occur when a sales manager has just sold something but he or she doesn’t really know what it was. Nor is it really part of the company’s portfolio. Based on an uncertainty it is not clear what kinds of requirements are needed.”*

*“In our case all products based on customer requirements – that is a starting point. Customer’s readiness for fast decision making is even more important in our business. Role of communication, information sharing and management cannot be underline too often.”*

*“In many cases challenge is how to bring together in sales situation a customer vision for new product and a lack of customer’s technical knowledge.”*

*“SME customers do not have as many resources and fine-tuned processes whether to use compare to large companies. That is an issue a company must take advance in sales negotiations. SME customer might require more guidance from us during sale situation.”*

*“Our company receive weekly special requests from products we don’t have in our product offering. If we got several similar requests we try to turn our production in that direction that production of missing items could be possible.”*

*“It is surprise how low is our customer’s technical knowledge when they purchase our products.”*

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*Understanding of a big picture from sales is most important. Enthusiasm for new product base on a customer idea is anyway needed but it is enough if proper paper work has not been done before final product decision. Much more will be needed than only a vision or a concept for a product making.”*

*“Target setting view point set by a company management a tender received from a customer as a first contact point is, in principle, a failure to sales organisation. Company management has indicated that a productised approach is a way what the company wants. Our task is found out a way how to make it happen.”*

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#### **4.1.4 Existing portfolio support**

Sales take contact to R&D unit to start an analysis how well a portfolio, service and/or a platform is able to support or will not support the customer demand. A “gap” analysis needs to be started to find out what is a missing part.

To secure successful rapid productisation resolution a support of an existing portfolio/platform is essential. Easiest way to continue building up a rapid offering is use one of the existing product or service as a platform. Main goal of gap analysis is specify how to modify existing product or service to match it to the customer’s demand. Without the platform support most of the cases a build-up rapid offering is not possible in given time. A list of portfolio related quotations from the interview is presented in Table 8.

**Table 8.** Quotations from the interview – “Portfolio support”

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*“Our challenge is a lack of product portfolio management. What we are doing is mainly inside the sales persons heads.”*

*“One challenge of being a contract manufacturing is a lack of big picture information in R&D. Sales must have better picture able to define requirements but in some cases relevant information is not transferred to the use of R&D.”*

*“Of case always can be said that there is no room for extra work.”*

*“Well done and early enough started preliminary study is a key issue. Sales use a sales configuration tool to help with selling global portfolio products. In case a product request comes outside the global portfolio offering use of the sales configuration tool is not an option. Sales need to get a technical knowledge from a R&D.”*

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#### **4.1.5 Business case**

If existing portfolio can supports new requirements collected from the customer rapid productisation process will continue into a **business case analysis** phase. In business case analysis more detail specification work will continue to determine customer’s requirement. Ultimate target is tried to find out a suitable solution for a **rapid offering**. Simple saying that phase means “able to understand what a need is and how it is possible to make it happen”.

Depending on how sales negotiations continue different type of analysis might be needed. In rapid productisation case it is important to be able to 1) recognise what is a customer demand, 2) how potential the business case is, 3) is it supporting existing platform, 4) is there suitable components available to be used, 5) possible use of 3<sup>rd</sup> party offering, 6) is a solution targeted only to one customer (“tailoring”) or 7) can it be extended to support existing/future offerings as well?

After the business case analysis company is able to response to the customer whether a rapid offering is possible or not. Ultimate goal of creating rapid offering is fast response to the customer whether a need can be fulfilled or not (improve level of customer service). Possibility to earn extra value for the company is also a plus factor. A list of business decision related quotations from the interview is presented in **Table 9**.

**Table 9.** Quotations from the interview – “Business decision”

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*“Rapid productisation starting point is reuse new implementation not only one customer case. Nowadays new product implementations base on customer’s requests. This means that own innovations for potential new product ideas has not been used in several years. A reason for that is company’s business model. Sales organisation has very good understood what customers want to have. Company can use that knowledge for creating new products.”*

*“During negotiation sales have an essential role to define a target price point and a schedule which are must have information to R&D in able to continue planning.”*

*“Rapid productisation in our company means ”a solution” not “a product”. Solutions are made for at the first phase only one or few customers. A solution is not volume product at the beginning. Company does not have rapid productisation process for a product but instead it is for a solution.”*

*“In our company we are making some new products base only one customer needs in a year. Decision in order to use rapid productisation needed from the owner of the company. Product decisions to small modification can be made in lower organisation level.”*

*“After analysing potential service provider’s products we select three to four best matching ones for detail analysis. How well the final solution proposal will match to a customer’s tender inquiry the better.”*

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#### **4.1.6 Creating of delivery and sales capability**

If the company work out a potential business opportunity the rapid productisation process can move to the next step. Big question will still remain how to fulfil customer’s preferences on the top of existing portfolio without compromising on-going productisation and production? That is the key issue when forming a delivery capability. How to use available resources such a clever way that maximum output of the organisation can be achieved?

For delivery capability creation resource planning and management need to be in good shape. Usually there are several options how to manage possible recourse shortage in situation like this. Delivery capability plan can be on following assumptions: 1) own implementation, 2) use combination of a 3<sup>rd</sup> party component/application and own integration (less manpower needed) or 3) use only 3<sup>rd</sup> party component/application and vendor for integration and implementation (does not use own resources at all). Before 3<sup>rd</sup> party provider/vendor can be used a delta compares to predefined offering need to be specified very detail level as early as possible (requesting a black box delivery). Using 3<sup>rd</sup> party vendor there can be used a framework 1) create a set of customer requirements and technical specification, 2) clarify is there suitable vendor available with a contract (legal issues done) and 3) has a vendor already done items to the global portfolio.

Sales need to make a decision whether a rapid productisation case is only for a single-customer (one shot) or will it be a generic part of local/global portfolio offering.

Profitability estimation is an essential part of sales capability creation. Business calculations should be at good level since at the end those numbers will be used into a tender. Overall rapid offering benefit and its importance is closely linked into company’s already on-going projects. Company needs to analyse a big picture and what is a total value of rapid productisation. R&D capability to do different thinks is always limited and on the other hand a production/manufacturing capacity (component available, volume or flexibility) might be a bottleneck. So there is lot of variables which need to take account before final sales decision is possible to make. A list of delivery and sales capability related quotations from the interview is presented in Table 10.

**Table 10.** Quotations from the interview – “Delivery and sales capability”

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*“In the nature of our business sets time to time restrictions for rapid productisation. Depend on a customer case a product could be single shot and it is not allowed to use for other customers.”*

*“Of cause way of doing varies is a product under development the finished product or tailoring from starch. In many cases own implantation is not optimal solution and instead of that a partnership could be an ideal way to make faster a new product.”*

*“Profit making is nowadays so essential that it limit in practise possibilities to maintain internal innovations and investments culture.”*

*“A really big problem from productivity view point is caused by a lack of used SAP system support of company’s business process. Maintain or update SAP design to support used process models is very costly (a price of tailoring) at least companies where process changes happen more often.”*

*“Currently we don’t have an official SAP compatible system available. An impact from that is a punch of solutions needs to maintain using MS Excel base in-house tool. Reason to use the unofficial system is more easy error handling process.”*

*“Start new tool development project is not a perfect resolution how to try to solve on-going problems. I have a good example how things can go. Our company start a new SW tool project to solve urgent issue. Tool specification and implementation goes well. In a pilot phase it was a surprise that none of end user teams want to take part to the pilot. What this indicates: peoples don’t want more “tools” it is opposite.”*

*“How to manage at the same time a supply chain pipeline requirements (= only a bulk or a standard delivery) and a product which is not made by company’s standard procedures? Function of the supply chain must not be mixed. The pipeline view point both cases should looks like same.”*

*“But you know, SAP tool can be a little bureaucratic. Meaning that if you are not using SAP tool daily basics you probably do not remember how it is working (a routine is missing).”*

*“In contract manufacturing it is all about documentation, a specification and a design from where a manufacturing is based on.”*

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#### **4.1.7 Hand over and order fulfilment**

What kind of information and from who is needed in order to start rapid productisation? A customer needs and company’s offering are always a starting point which a tender will form. More important when continue a process of rapid productisation is building up understandings who are other possible customer interested (related to a portfolio management and global/local product). Requirement specification and a customer process analyses which will provide a big picture what will be needs of the customer. The main issues to been known is what is a gap between the customer need and existing portfolio.

In case own implementation cannot provide a solution sales team must specify why they want to use certain 3<sup>rd</sup> party provider. Reasoning is more important if a vendor is not in company’s list. Sales must provide detail level product specification and how an application is linked into platform and possible 3<sup>rd</sup> party product. High level management support for the assignment is needed. Will current contracts cover a case or is there need to make changes? Supplier selections process for an OEM item plays quite a big role.

When the customer has accepted the rapid offering sales can start a hand over process with R&D and other organisation units taking part to the final delivery. The most important issue in hand over process is defining an ownership for new product or service. The owner could vary depending whether the rapid offering is targeted to local or global markets. Delivery organisation takes final responsibility and can start an implementation of new product or service. Implementation can be made by using own resources or 3<sup>rd</sup> party vendor. Company has to have guidance how to manage hand over from rapid productisation process to the implementation process. A list of Hand over and order fulfilment related quotations from the interview is presented in Table 11.

**Table 11.** Quotations from the interview – “Hand over and order fulfilment”

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*“A portfolio management challenge is constant change of technology and customer’s requirements. Hot technology or feature today could be history after a year. That is why there must be a solid base from where to make a product and an investment decision. From a customer view point is it untestable that it is easier to create innovating feature/product request than implement those in practise.”*

*“Rapid productisation is possible and in the best case normal six weeks productisation can be shorten to one week. Five weeks saving was huge but required huge effort to make happen. How this was able to do? Basically there was no other ways than brake all company’s standard processes rules and guidance.”*

*“Rapid productisation can be made using a solution provided by a supply chain network).”*

*“Rapid productisation process exists and it’s works quite well. Interfaces, tools and organisations are defined. I see that need for rapid productisation will be increase in the future. Able to react fast and be flexible are key asset in a customer relationship. This require more and more also from sales and R&D cooperation.”*

*“I would say that rapid productisation works quite okay in our organisation. Mainly because we have defined clear instructions and nominated key persons.”*

*“So you would definitely say that rapid productization is an important aspect in the future? Yes, it is. I don’t like to hear any lost deals because of a delayed productisation.”*

*“Current trend of rapid productisation is fast try-outs using pilot cases. In the past a rapid productisation case was done even a customer seems not to known how to make an order of a case. That was really fast productisation and it finally ended up as a part of portfolio.”*

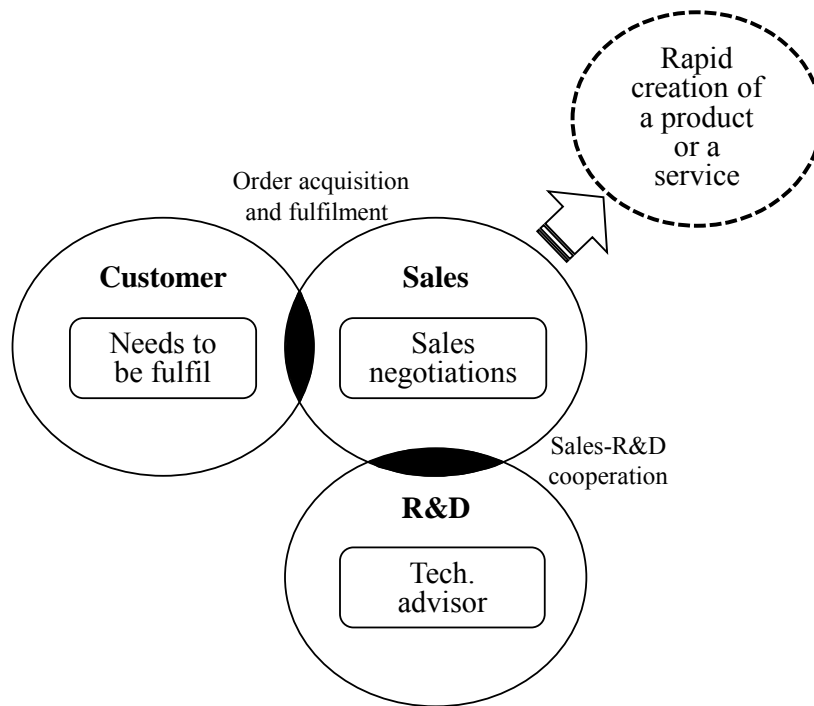
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## **4.2 Sales-R&D cooperation in rapid productisation**

In sales-R&D cooperation it is important to draw a picture what is the gap between existing portfolio offering and preferences required by a customer. There are typically two approaches how a company’s sales team and a customer face each other’s 1) sales take active role to contact potential customers to promote a portfolio offering or 2) an invitation to tender sent by a customer. Both cases require a “gap” analysis to find out what is a missing part of the portfolio. The invitation to tender base work is straight forward and main task is fulfilling all possible parts mention in the tender. Time is a critical factor in case of an invitation to tender. That is because most likely the customer has sent several invitations to tenders to potential vendor and it is important to fill an offer as it asked by the customer in given timeline.

From a product making viewpoint a company orientation can be divided into two different models 1) *market* or 2) *technology* orientation. From cooperation viewpoint R&D’s role is different whether we are talking about a company which use either market or technology orientation. A market driven company try to use proactive prediction to fulfil next possible customer needs. The need could rise i.e. from a market analysis. Based on the market analysis a company can estimate how well products actually could sell and what is a business benefits to the company. A technology driven company will make product or services using technology itself as a driver. This will set more pressure to sales organisation in able to sell to an end user those products or services. Technology orientation is R&D-sales joint venture.

In this case, a business-to-business (B-to-B) sales is based on a product or service oriented marketing, an aim is to sell products or services exist in a portfolio to a customer. In sales situation negotiation between a sales team and a customer purchase team is long and multiphase. Target of the sales negotiation is define what a customer need is and how it can be delivered. In case a predefined offering is not a solution to the customer’s preferences sales team need to start working in a close cooperation with company’s R&D unit to rapidly create a product or service (Figure 6). In this study Sales-R&D cooperation (SRC) is further analysed in a context of rapid productisation.



**Figure 6.** Creation of a product or a service

Sales-R&D cooperation will be started by a customer's request which cannot be fulfilled directly in sales situation. A new product or service idea is coming from the customer and it is an input (*initiation*) to start a feasibility study of potential new service, product or functionality within an R&D unit. R&D organisation and sales together make an *analysis* what might be a potential customer solution. Before final *decision making* a delivery and sales capability must be defined. After an offer has been approved by the customer (solution) *hand-over* to R&D must be done before implementation could be started. Main phases of Sales-R&D cooperation are presented in Figure 7.



**Figure 7.** Main phases of Sales-R&D cooperation

Due to the fact that sales is working in a customer interface sales have the best understanding of what are the most important requirements to the customer are. As a starting point sales and R&D has to make sure that similar product will not already exist in the company's product portfolio or service. Sales-R&D cooperation in rapid productisation is presented in Figure 8.

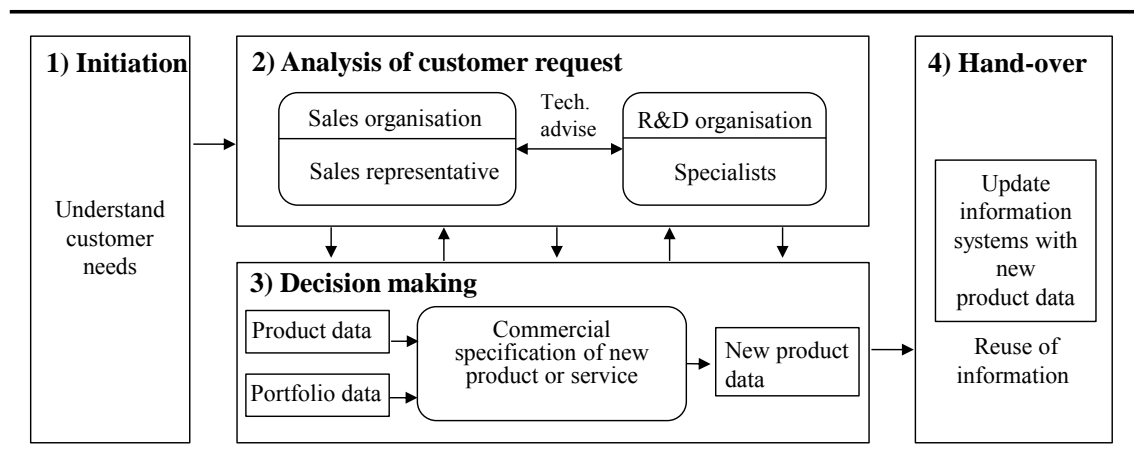
Main part of needed information and documentation should be already available in R&D during a rapid productisation work flow. Big information related advance in rapid productisation is already existing portfolio, service and product data. That is why there is no need to start analysis from a scratch. When using a 3rd party solution to add additional value a role of correct information is certainly important.

Main information which sales must understand and be able to transfer into the R&D is a customer's business need. R&D's technical knowledge from product and services needed in the gap analyse compare to a predefined offering. In the gap analysis a value proposal and reasoning for a business case is needed to formulate.

Value proposal is estimation what could be a benefit (costs vs. profit) for the company from sales and R&D view point. It have also first estimation of sales volumes and life cycle forecasts. Documentation and information needed to produce for a business case:

- 1) Requirement specification,
- 2) Project planning, schedule, functional description, design/layout,
- 3) Cost estimation and pricing,
- 4) Road mapping and version management,
- 5) Legal contracts,
- 6) Plan how to implement a 3rd party delivery,
- 7) Volume estimation.

Also data and documents required for sales channel should be easily available and most of them will not require extra work (parameters like product weigh and high, forms, stickers, codes, nutrient, production guidance for tooling, major part of customer approvals, what are a retail channels to be used, target customer segment(s), possible allergens, packet design etc.).



**Figure 8.** Sales-R&D cooperation in rapid productisation

Sales-R&D cooperation is a team work between R&D specialist, sales and also with a customer (Table 12). When using 3<sup>rd</sup> party solutions it is very important to manage and maintain up to date service provider network. Limitation factor to use 3<sup>rd</sup> party solutions might be a total resource need for a project. In practice resource need should be quite big (hundreds of man-days) before use of 3<sup>rd</sup> party resources makes sense.

Details of a customer deal will be negotiating between a customer's purchase team and sales organisation. It is important that sales know what are available systems, solutions, products and vendors to be used. R&D has major role to provide that information to the sales organisation. In case new sales item needs a new supplier, it is essential that all organisation units know it. That guarantees that a correct supplier entity will be open in our order management system. Sales team is responsible for a customer negotiation and sales must take care of information sharing inside the organisation.



**Table 12.** Cooperation between a company and a customer

<b>Cooperation</b>	<b>In company organisation</b>	<b>In customer organisation</b>
Sales negotiation	Sales	Purchase
Requirement gathering	Sales	Purchase
Sharing of technical information	R&D	R&D
Creation of rapid offering	Sales – R&D	-
Final decision making	Management/Sales	Purchase

### 4.3 Summary

Rapid productisation introduces a strategic approach to company management, which will help companies focus their productisation efforts in order to increase their return on development and become more competitive. Rapid productization is a **mode of operation** which creates a field for faster response for a customer demand than with “a standard” productization is able to achieve. On the other hand rapid productisation process creates *disruption* into an organisation. Rapid productisation as a framework is a way to fix the portfolio shortage whatever the reason behind for it is. Use of rapid productisation framework is not needed if predefined offering (a portfolio) match to the customer’s demand.

During a *business case analysis* phase a company need to decide whether there is possibilities to response or not to the customer’s demand and make a rapid offer for a new product or service. Business case analysis is a key stage and it is not fast if the rapid productisation *process* requires a data collecting far too detail level. One way to speed up the analysis is 1) limiting a number of used interfaces’ 2) do less unnecessary paper work and 3) throw away routine meetings. This will boost the rapid productisation start up and streamline running of whole process.

Correct product data at the beginning is an essential requirement how to secure smooth flow of information between sales and R&D during a rapid productisation. Fragmented and massive tools landscape is not helping to achieve a goal like this. Product lifetime management request certain decisions from sales. One particular important decision is whether a rapid offering is only for a single-customer (one shot) or will it be more generic in the future (a part of local/global portfolio offering). If the global rapid offering is a resolution it will require probably more work from R&D in implementing phase. Sales should be aware of company’s supplier network in case a 3<sup>rd</sup> party component is required. Process is much faster if a supplier is evaluated beforehand and they are aware of company’s policy. Productisation is not rapid for new product if an evaluation is needed.

One question needs still an attention. That is how to link parallel a rapid productisation process and a standard productisation process together? Base on the interviews a real challenge is how to manage at the same time rapid productisation and on-going standard productisation. Mainly due to fact that available resources are in a way or other limited. An aim of productisation process is make sellable and well produce products. Products which are based on early enough prediction what are customer’s preferences, successful launch and a life cycle management. Rapid productisation is an exception and to use it a company need to differ from an approach they normally use.

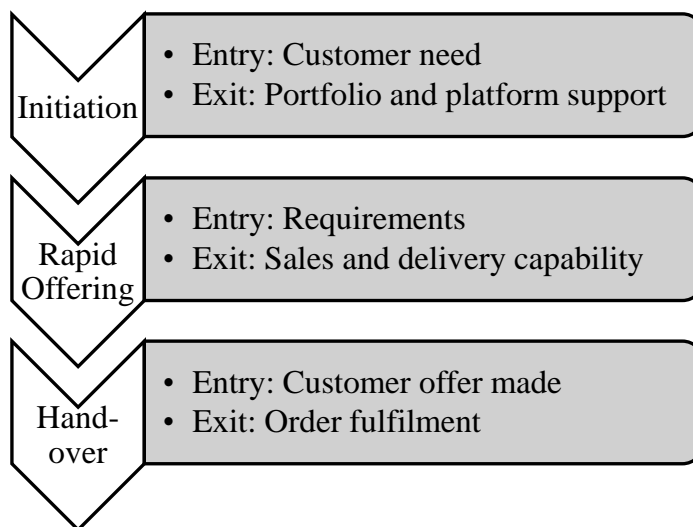
### 4.3.1 Fast track

Normal productisation is determined in advance and it is an orderly process. It could have several tiers like: 1) *strategic upper tier* which consist a target setting and final decision making, 2) *a portfolio and product management tier* and 3) *a program/project tier* with planning, implementing and control (gates with an entry and an exit criteria's).

Using rapid productisation process a company try to solve an unexpected portfolio shortage which has been popped up in sales situation. That is a reason why a nature of rapid productisation process cause challenges to execution of productisation process. From the productisation process view point the rapid productisation process is unwanted disruption causing a lot of problems.

A defined process itself can set all kind of limitations how to do or make things happen. Use of rapid productisation process makes no difference and it is even more challenging due its nature. My proposal to manage rapid productisation process is use “*a fast track*” framework. It means less milestone gates, entry and exit criteria's to be used compare to normal productisation process. An objective set to rapid productisation is faster execution compare to normal productisation. This is not possible if process model to be used is not fine-tuned.

What is needed to implement a fast track framework into extension of the productisation process? Only way how to achieve smooth and fast progress of rapid productisation process is 1) strict and well done guidance, 2) very limited milestone gates and 3) fine-tuned entry and exit criteria's. A mind-set in all implementation levels should be agile not bureaucratic. Fast track phases are presented in Figure 1.



**Figure 9.** Fast track phases in rapid productisation

### 4.3.2 Challenges and improvement in sales-R&D cooperation

A list of challenges related quotations from the interview is presented in Table 13.

**Table 13.** Quotations from the interview – “Challenges”

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*“If a company have rapid productisation process I am not aware of it.”*

*“Challenge is a size of the company. Smaller company advantages in most cases are 1) lighter processes, 2) persons will know each other’s, 3) clear responsibilities and 4) faster information sharing. A goal is not make a rapid productisation process model too ideal and theoretical. More important is modify current tools and processes far more simple. That is how systems can be less effort hungry and processes can be strait forward.”*

*“Large company challenge in rapid productisation is 1) organisation structure, 2) number of roles, 3) process throughput time, 4) hand overs between interfaces case slowness, 4) lack of decision making and 5) how to maintain key competencies. It is very dangerous from process point of view if responsibilities are not crystal clear.”*

*“In fact internal software development takes so long time that there is no need for any fast actions. Software can be made through normal productisation process. Company has a lot of one customer projects and outcome of projects will base on solutions which our supply chain network can offer. Those solutions are not a portfolio compatible.”*

*“It is hard to balance between engineering to order and rapid productisation. It is all about budgeting and resourcing. Request for a rapid productisation break internal “stability” of business unit and that is hidden reason to resist requirements coming outside of existing product portfolio range.”*

*“In a small and fast project danger could be a lack of necessary technical awareness of needed development cycle. In large company person’s technical knowledge could be narrowed. Lack of software understanding when sell and buy software (intangible goods is not same as a product).”*

*“And if the people are staying in the same position for a longer period of time, of course their competence grows. And they see the importance and also learn the bigger picture, than, compared to the situation that there are people transferring somewhere every six months. And then you start to educate the new person again that what is the process and why I’m contacting you and why I’m asking these issues.”*

*“Total value of using rapid productisation should be evaluated case by case. In practise able to add any new product into pipeline means cancellation or termination of something else. This is a key of portfolio management in particular when outsourcing is not an option. Of cause business value is significant if closing a sales case is depending one small item which can be produce through a rapid productisation framework.”*

*“Behaviour of a commercial market is how to say “old fashion”. It will expect use of methods which has proven its capability and functions. Breaking “the ice” might not be a solution in that kind of market areas. More benefit can be achieved using rapid productisation way of doing to fulfil customer preferences. Rapid productisation is also suitable method to be used to reach new market areas.”*

*“How to control total capacity usage is the key issues.”*

*“Resource balancing is challenge if work load is not under control.”*

*“Current challenge is how to improve our internal data systems to better meet today’s requirements. In practise problem is how to balance resource between customer and internal development projects.”*

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A list of improvement items related quotations from the interview is presented in Table 14.

**Table 14.** Quotations from the interview – “Improvement ideas”

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*“In principle product management should be involved into rapid productisation process at the begging of new product sales. Product management have needed technical knowledge and they are able to help during sales negotiations how to fulfil a customer preference.”*

*“Question is how to minimise 1) all kind of waste, 2) make rapid productisation process straighter and at the end 3) speed up a product making. There is place for clean thinking. Product structure management is not a place where to do product design.”*

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Table 15 summaries findings and list corresponding benefits of corresponding proposal.

**Table 15.** Summary

<b>Findings or improvement needed</b>	<b>Benefit or correction proposal</b>
How to better reuse requirements collected from customers?	Less tailored products targeted to one customer only.
How to ensure that enough new product information (customer need) is available for delivery capability planning?	Information management must support decision making meaning less overlapping works and speeded up creation of rapid offering.
How to get a portfolio support if not been formed in sales situation?	Clear decision making how to reuse unnecessary variety. Synergies using common platform
How to break a typical engineering mind set – no decision making if all data is not available?	Faster analysis when decisions can be formed even available data cause uncertainty.
Processes in use are not up-to-date (different <b>practises</b> not <b>processes</b> in use).	Reproducibility is under control.
Better process descriptions how rapid productisation works (and training).	No grey areas in decision making and responsibility.
Exact vision of rapid productisation usage from company management is missing.	Sales have one additional tool more which can be used for revenue making in sales situation.
Unclear to whom should take a responsibility for rapidly productised products?	After sales marketing and PLM in order.
Business case analysis is not fast enough.	Sales window might close. Predefined solution team.
A complex organisation structure force too many organisation unit and interfaces working together.	Narrowed organisation structure whether will better corresponding use of fast track.
Better information tool system's support during sales negotiations.	That will definitely progress able to make fast decision in sales negotiations, faster a tender process and secure a product quality.
Sales should be aware of company's supplier network.	Faster throughput if a supplier evaluation is not needed.
Fragmented <i>product creation</i> organisation is at the moment a show stopper for a successful rapid productisation.	Organisation streamline.
Unplanned error fix rounds will take too much time and effort from R&D.	Platform to be used should be mature enough.
An ERP system sets borders between a productisation processes and how work is done in practise.	This is a challenge for ERP tool vendor and as well as a company. How to make better tools to serve used processes in practice.
Tools landscape fragmented.	Better data mining and faster product

	data handling.
How to secure smooth flow of information between sales and R&D during a rapid productisation?	More effort to build up working product data management practises.
Supply chain is not as flexible as it should be.	Build a dynamic supply chain network to ensure its have fast response and delivery capability.
Better cooperation management between sales and R&D	Sales know what has been done so far and what is organisation capability produce more products or solutions.
Common guidance and process descriptions are missing. Works relay too much on individuals.	Rapid productisation needs own process guidance.

## 5 Conclusion

Rapid productisation process is a valuable weapon against the unnecessary growth of the product variety. Even an aim is faster and better response to customer's preferences, in rapid productisation, the target is to control product variety and operational performance. This is possible because of rapid productisation process efficiently utilise organisation to use available technologies, platforms and product data in order to maximise usage of limited resources. Fast and successful rapid productisation process required close and smooth collaboration between sales and R&D. A customer interface is also important since rapid productisation kick-off is triggered by new preference from the customer. If sales-R&D cooperation is not working as it should, building a rapid offering matching to customer's requirement takes longer period of time. In that situation a window for fast business opportunity may close.

The most important phase in rapid productisation success is what is happening in sales negotiations. What does an unexpected customer demand mean in practise? Fast response to customer need requires better overall information handling and tool systems supporting sales negotiations. From sales point of view this is challenging since in rapid productisation e.g. sales configurator tools cannot be used. It is not meant to be that making a rapid offering it is a step for unknown to an entire organisation. It is important that sales organisation will get all possible help from other organisation. That will definitely progress able to make fast decision in sales negotiations, faster a tender process and secure a product quality. Main question is what is a gap between the customer requirements and existing product or service offering? How to fulfil new requirements and what kind of options there are to make it happen in practise? Main point during rapid productisation process is known what the gap is. Key issue when starting a gap analysis is define how well existing portfolio is capable to support customer's demand. If there is not enough support it automaticity means that rapid offering is not possible at all.

One very visible finding was at in large companies is that a productisation in general requires too many persons or interest groups participation (total number of counterpart interfaces). A challenge is how to take advantages of best parts of productisation process and use only those practises also in rapid productisation process. At the first phase very limited number of involved participants from sales and R&D (decision making and analyse) is the must. What are decision making criteria's - are they clear enough to all contributors?

If rapid productisation process will be handled like a basic productisation process there are no possibilities to get any improvements like faster throughput. One important target of rapid productisation process is to use less or minimal engineering work (manpower) and have predictable delivery than most of productisation cases in general. That advantage will be losing if the process itself is not steamed compare to basic productisation process.

In a company were has a lot of interfaces, organisation units, unknown persons and different set of tools are compline to work together should careful consider when creating a new product to sales. The organisation like that is quite far from being agile, rapid or anything else like that. Large organisations have more often a complex organisation structure and unclear areas of responsibility. It should not be but it is more than obvious that a case handling takes extended period of time. This is not easy case companied into many global organisations' challenges 1) sites are located in different parts of the world, 2) time differences, 3) different local working cultures and 4) processes and guidance are not necessary followed. Simply saying

from rapid productisation view point there are too many persons dealing with the case and they are not work along by a book.

Most cases adopting rapid productisation process it will require at least some organisational and company cultural changes. Main part of change should be happen in a mental level. Old way of doing and decision making practises is good to through away. Somebody has said that “*be able to learn new things man must learnt ability to forgetting*”. I think that is very much cases as well when start using process of rapid productisation.

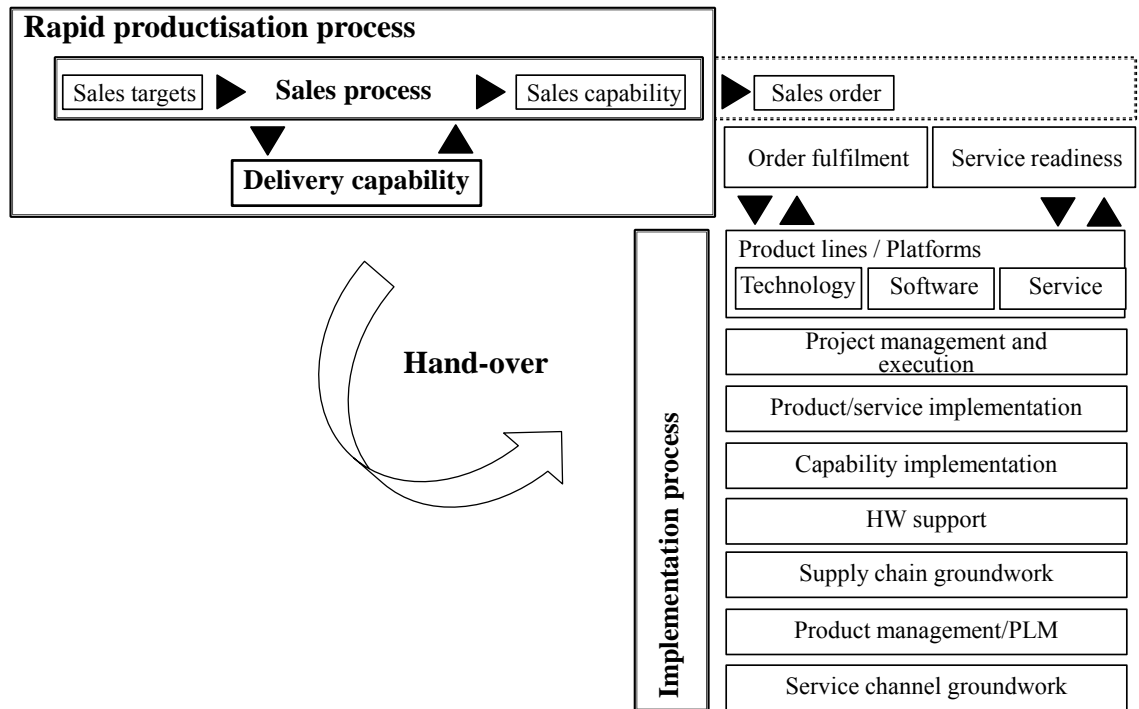
I propose that a team structure will be established in a way it can support rapid productisation. There could be e.g. *predefined* teams with selected specialist and a team will step up when their skills are needed. Able to response fast means wider responsibilities and fewer people with a decision making authorisation. Decision making should happen on that level where issues will be handled. It is also essential to avoid unnecessary milestone steps to speed up throughput time needed for rapid productisation process. Current sales and R&D milestones need to be evaluated to get better rapid productisation support. Also a project management practises should be tuned supporting fast and lean practises. Grey areas in decision making need to be identified and make necessary changes how to avoid inability of a decision making chain.

One way to improve rapid productisation process is nominate sub-process owners to each key rapid productisation areas. Main task what they need to do is secure smooth use of rapid productisation process and maintain functionality of the process. In presented process model key sub-process phases are 1) business case analysis, 2) delivery capability, 3) sales capability and decision making and 4) hand-over to implementation. Rapid productisation should have as fast as possible analyse. If it is one customer case product documentation can be lighter than a case when a product is a part of portfolio. Challenge is how to balance between a time pressure set by sales and a process requirements set by management.

We can ask from ourselves is it the best how to collect and publish information in case of rapid productisation? Is it essential important that all parties and organisation units will know that is on-going? In rapid productisation this is not the case. Remember that rapid productisation an extension and separate line of the NPD chain. Main point in rapid productisation is to ensure that all necessary sales and R&D interfaces will get the information. In other words make sure that only absolutely needed organisations units and roles will be involved and those got information of new productised product. In minimum decision to start a rapid productisation should be able to make within minimum participant from sales, R&D and company’s management team.

### **Future research**

From a customer view point rapid productisation is an important step on the journey to get a desired product or service. From the product or service view point one essential phase is still needed – the final implementation. That is why a hand-over with R&D is crucial step how to ensure the customer satisfactory. It would be interesting to examine how R&D is able to use reformed product data in operation.



**Figure 10.** Rapid productisation process hand-over to implementation process

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

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

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