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**SERVICE PRODUCTIZATION ENHANCING JOINT SERVICE CREATION FOR
RESEARCH LABORATORIES**

Case study: UNELMA-Project

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ABSTRACT

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Title of Bachelor's thesis: Service Productization Enhancing Joint Service Creation for Research Laboratories.

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The purpose of this thesis is to demonstrate and show how productization can enhance joint service creation for Research Laboratories based on UNELMA-project. The goal is to create a joint service that is simple, manageable and understandable by all stakeholders.

How productization enhances joint service creation for research laboratories have been discussed comprehensively. The literature review shows that the actual benefits of a service offering can accrue to service providers as well as service consumers if a service is well productized. The research approach is a combination of qualitative and case study methods. Data is collected through workshops, project articles, documents and observation aided by service creation tools. The service creation tools used are; Idea tree, Service blue print, Business model canvas, Value proposition canvas and Productization canvas.

Joint service network stakeholder's expectation has been examined from the data gathered. Both service providers and customers have their own expectations. However, they have a common ground of collaboration and cooperation into the future through a productized joint service network branded Applied Imaging Network abbreviated as AIN.

Ultimately, productization enhances service creation and assists in sales marketing by making the service simple, manageable and understandable. Thus, it makes easier for the customer to make buying decision.

Keywords: Productization, Service, Joint Service Creation, Tangibilization, Stakeholders

CONTENTS

ABSTRACT	3
CONTENTS	4
1 INTRODUCTION	5
1.1 Background of the thesis	5
1.2 Scope and limitations	7
1.3 Structure of study	8
2 SERVICE PRODUCTIZATION LITERATURE	10
2.1 The concept of service productization	10
2.1.1 Service	10
2.1.2 Productization	12
2.2 Productization process	17
2.3 Model for service productization	23
2.4 Productization boosting sales of a service	24
2.5 Summary	26
3 RESEARCH METHODOLOGY	28
3.1 Research approach and strategy	28
3.2 Data collection	31
3.3 Triangulation approach	36
4 CASE STUDY OF UNELMA-PROJECT	38
4.1 Background	38
4.2 Analysis of Stakeholders expectations	39
4.3 Concretization	43
5 CONCLUSION	47
6 DISCUSSION	49
REFERENCES	51
APPENDICES	54

1 INTRODUCTION

In this section, the background of this thesis is described, followed by the objective of the thesis and research questions. Then, scope and limitation is defined; thereafter, terminologies and essential concept are explained, and lastly short structure of study is presented.

1.1 Background of the thesis

This thesis is founded on a project know as UNELMA. The project has been initialized as a result of the need to maximize the utility of high-tech research institutes and laboratories across Nordic universities. UNELMA-project is a platform to develop a joint service within the Bothnian Arc.

The research topic demonstrates how service productization can enhance creation process and assist in sales and marketing of the created service. The present author's knowledge is based on personal participation in joint service creation workshops held during the project phases, articles and project document provided throughout the process. Participating in joint service creation phases of the UNELMA-project, the author has widened the knowledge of service creation from exploration through concretization of the service. The author has participated in total, four workshops. See appendix 1).

Service productization concept has been introduced into the project towards the end of exploration phase. This is because productization concept enhances creation process and implementation of joint service. Service productization is about concretizing service to obtain characteristics of a product, such that the service becomes simple, understandable and manageable. The concrete aim of UNELMA-project is to develop a jointly operated high-tech service concept based on the facilities and research equipment of the universities. The project is European Union funded and participating research institutes are in Oulu and the Kemi-Tornio area in Finland, together with Luleå and Piteå in Sweden. Therefore, the jointly operated high tech service concept established under UNELMA-project is expected to significantly benefit both Universities and the industry. It will offer customers the required expertise and related infrastructure in various materials analyses, characterization and imaging technology needs. This service concept will provide a platform for service providers to easily engage with the customers.

Today high-tech environment is very dynamic. The impact of emerging technologies is huge in this industry. The conception of unique and innovative ideas has changed the business world. Therefore, development of jointly operated service concept brings a paradigm shift to how services are offered especially in high-tech industry. The emphasis is on collaboration and co-operation of network stakeholders such that in the long run the joint service network will enjoy economies of scale and command regional presence. Productization of AIN services will change high-tech environment of AIN into a more marketable mode that would facilitate sales to larger and global customers. Successful UNELMA-project will benefit stakeholders as a result of streamlined processes, adequate support system, enhanced competitiveness and eventually increased sales.

This thesis is based on jointly operated service creation process. It articulates how productization can enhance service creation process as well as assist in sales and marketing of the service. The terms service and productization will be defined in details in subsequent chapter.

Objective of the thesis

The main objective of this thesis is to demonstrate and explain how productization can assist in joint service creation for Research Laboratories based on UNELMA-project. However, on the process of fulfilling the main objective the study will realize the following other aims;

- a) Translate the abstract service and its creation into exchangeable objects and controllable processes.
- b) Illustrate how UNELMA-project can attain features and characteristics of a product to make the service manageable and understandable.
- c) Make the UNELMA-project service easier to offer to the customer and simple for the customer to make buying decision.

Research questions

The major research question of this study is: How can productization enhance service creation for research laboratories?

Stemming from the main question is the other three research questions:

Research question 1: *How does theoretical literature address productization of service?*

- a) What is a perfect productized service?
- b) What are the key success factors in provision of services?
- c) What are the challenges in productizing services?
- d) What process should be followed in productizing services?
- e) What are the aspects of productization?

Research question 2: *What are the expectations of the stakeholders of the UNELMA-project based on joint service offering?*

- a) What do the stakeholders of UNELMA-project expect?
- b) How can productization enhance joint service creation?
- c) What is the initial expectation and how can productization improve the same?

Research question 3: *What is the foreseeable impact or benefit of productizing UNELMA-project joint service network and what managerial recommendation can be given?*

- Does productization enhance service creation and make the service manageable, understandable, easier to offer and make client buying decision simpler?

1.2 Scope and limitations

This thesis focuses on intricate B2B services in the high-tech research institutes and laboratories across Nordic universities. The focus is on studying how productization can enhance joint service creation for Research Laboratories using the UNELMA-project as the case study. A systematic theoretical process of service productization, have been demonstrated through this thesis in chapter two. However, the theoretical structure is broadly valid in the complex B2B service industry. The ultimate service productization process and the suggestions are meant to be specific concerning the UNELMA-project and they might not be applicable beyond this perspective.

The hypothetical framework should be able to be used in general situations of complex B2B sales and in more often than not also to lesser complex service situations. The context of theory can be generalized restrictedly to only B2B markets, given that B2C markets are extremely different. Nevertheless, some parts of the theory can also be useful in the B2C perspective.

The experimental part of the study, the UNELMA-project case study, exclusively focuses on the expectations of the stakeholders of the UNELMA-project in respect to joint service offering. Moreover, the present situation of high-tech research institutes and laboratories in some of Nordic universities is also observed. Caution should be exercised if; the results and recommendations are generally applied beyond this context.

Terminologies

Stakeholders - These includes service provides and service consumers

UNELMA-Project - Unelma is Finnish word meaning a dream.

B2C = Company selling its product to the consumers.

SPI = Service performance insight.

OUAS = Oulu university of applied sciences

AIN = Applied Imaging Network

B2B = Business Company to another Business company.

1.3 Structure of study

The study is divided into five sections. It starts with the introduction chapter that gives an insight to the thesis topic and general issues that the thesis relate to including the genesis of the study. Further, the chapter gives you an idea about the aims and objective of study, put together research questions, discusses the scope and limitation of study and explains terminologies used in the thesis.

After the introduction chapter, the chapter on service productization in theory follows. This section lays down foundation of study and provides rich knowledge required to understand the practicality of service productization. The chapter brings the theoretical dimension of the study in preparation for the empirical part. It discusses the literature with reference to concept, process, and model for service productization. In addition, how productization can boost sale is argued out and summary of the whole literature is done at the end of the chapter.

Chapter three is concerned with the research methodology. The chapter describes the research procedure and the data gathering methods used. Reliability and validity of the data is as well presented in this section.

The fourth chapter portrays the practical part of the study. Service productization is interrelated with UNELMA-project, stakeholder's expectation is analyzed and concretization of the service is done.

The conclusion brings together the literature and the UNELMA-project case study analysis. The lessons learnt are discussed; information is pooled to draw conclusion and recommendation to the service providers. Finally, the study is discussed.

2 SERVICE PRODUCTIZATION LITERATURE

This chapter provides a deep understanding of productization in relation to a service. Some relevant theories and findings on the subject are explored. After going through this chapter you will be able to comprehend; the concept, the process, and the model of service productization as well as how productization boosts sales.

2.1 The concept of service productization

In order to understand service productization concept the two words service and productization are discussed.

2.1.1 Service

“Service is deeds, process, and performances” (Zeithamal, Bitner & Gremler 2006, 4). Going by this simple definition of service, it shows clearly that services are not only offered by service business but also by companies that manufactures goods. Moreover, a service forms an integral part in delivery and distribution of goods produced. A well designed and created service enables proper management of distribution channels thus increasing sales of goods and services.

In order for a service to be effective, service design and creation is inevitable. Service design is the activity of planning and organizing people, communication infrastructure and material components of a service in order to improve its quality and the interaction between service provider and customers. (Wikipedia 2013, date of retrieval 07.09.2013). People affect efficiency and effectiveness of a service. Therefore, they need to be controlled through well laid down infrastructure and proper communication. By so doing, customer needs will be understood and subsequently the service will be user friendly, competitive and relevant. Service design is very important concept as it may inform changes to the existing service or creation of a new service. Service design stage should involve experts in order to understand the customer needs, their behaviours and motivations. At this stage, the expert conduct interviews, workshops and make observations to gather information that will enable to develop concept and ideas that can be sketched or prototyped.

Later in this chapter service design and creation will be discussed in-depth in relation to service productization.

Services are networked intelligence with the following characteristics as shown in Table 1

TABLE 1. Characteristic of a service (Zeithaml et al. 1996, 19).

Characteristic	Description
Intangible	<p>Services cannot be inventoried</p> <p>Services cannot be patented</p> <p>Cannot be readily displayed or communicated</p> <p>Pricing is difficult.</p>
Heterogeneous	<p>Service delivery and customer satisfaction depend on employee actions.</p> <p>Service quality depends on many uncontrollable factors.</p> <p>No surety that the service delivered matches what was planned.</p>
Simultaneous production and consumption	<p>Customers participate in and affect the transaction.</p> <p>Customers affect each other.</p> <p>Employees affect the service outcome.</p> <p>Decentralization may be essential.</p> <p>Mass production is difficult.</p>
Perishable	<p>It is difficult to synchronize supply and demand with services.</p> <p>Service cannot be returned or sold.</p>

Since all services portray the above characteristics, service providers need to answer all the questions below when designing a new service or improving on an existing service (Zeithamal et al. 1996, 21-22):

- *How can service quality be defined and improved?*
- *How can new services be designed and tested effectively?*
- *How can a firm be certain it is communicating a consistent and relevant image?*

- *How does the firm accommodate fluctuating demand?*
- *How can a firm best motivate and select service employees?*
- *How should prices be set?*
- *How should a firm be organized so that good strategic and tactical decisions are made?*
- *How can a balance between standardization and personalization be achieved to maximize the efficiency of the organization and satisfaction of its customers?*
- *How can organization protect new service concept from competitors?*
- *How does the firm communicate quality and value to consumers?*
- *How can organization ensure the delivery of consistent quality service?*

Answering the above questions in respect to a particular service makes the service manageable, understandable, easier to offer and make client buying decision simpler. In this case, productization of service provides answers to the questions.

2.1.2 Productization

Productization is the act of modifying something such as concept or a tool internal to organization, to make it suitable as a commercial product. Also is to make an idea, a service or an item into a product that can be sold. (Macmillan 2013, date of retrieval 17.11.2013). In simple terms, productization is making the service to look more like a product through a process where service content, purpose and price is defined and packaged into systemized service offering. Productization should not be confused with production. Productization is a conceptual process.

Productization is crucial for the following reasons (Radford 2004, date of retrieval 08.09.2013):

- It helps to ascertain value when trying to establish credibility with a new client or prospects.
- It makes it easier to explain to the sales force of a productized service thus making the sales personnel more productive.
- It helps to improve differentiation for service offering.
- It supports consistency and repeatable service delivery. Therefore,
- Increase customer satisfaction thus; increase sales and improve profitability.

Productization if done professionally can improve the overall firm efficiency.

Understanding of the terms service and productization, provides a rich knowledge base to discuss the concept of service productization. Service productization concept entails how to make a service attain characteristics or features of a product. The idea is to modify the service concept and design to (Stickdorn, Schneider, and co authors 2011):-

- Specify and standardize the service offering.
- Make the service tangible and concrete.
- Make systems and standard process and method.

In order to meet the aims and objectives of joint service concept and creation, productization is inevitable. The services have to acquire characteristics and features of a product to make them saleable. The biggest challenge in selling a service is that it is intangible. Until the prospective customers experience your service they cannot tell if the service will solve their needs. Therefore, to make a buying decision of a service, the customer must trust and be convinced that the result of the service will fulfil his or her needs. (Hill, 1999, 427- 430, date of retrieval 24.10.2013)

Productization of service negates the challenges of selling a service. Through productization, a service obtains some of the features and characteristics of a product that make it more manageable and understandable. A productized service becomes easier to offer to the customer and make clients buying decision simpler, thus increasing sales. (Ylitalo 2011, 78)

(Ylitalo 2011, 4) The process of productization starts with the defining the basics of the service and service process. The main thing is to define the customer segments and customers, what kind of services should be offered and what are the needed resources. Understanding the fundamentals of a service means that, you get to know what you are providing to your customers and the benefits they derive from the service as their needs are fulfilled. Service process is essential to produce desired result to the customer. It involves service process design that shows step by step development of the service from the service provider to the service consumer. Therefore, subdivision of customers helps to customize and standardize the service in accordance with segments. In addition, the needed resources can be estimated and utilized in an efficient and effective manner.

Target customer definition is crucial in productization process (Ylitalo 2011, 75). The service provider must know the group of customers in which the service is directed to. Broadly, there are two

segments: Business to business and business to customer segments. In the case of UNELMA-project the service is business to business. The initial process when productizing a service is getting to know the challenges, needs and problems of business to business customers. Having known the target customers it is important to analyze and define service offering. Divide the service into different groups and identify focal services. Choose which ones you are going to productize according to their specifications, resources, quality and their meaning for the company. After the choice of the service the following questions must be answered: (Ylitalo 2011, 76).

- What benefit does the service chosen give the customer?
- To whom is the productize service benefit?
- How does the productized service benefit the concern parties?

Once the above questions are answered identify market potential, sale estimates, competition and /or possible substitutes of the service. Set out a service package that includes the core services and support services, part of which can be standardized and others customized according to the needs of the customer. In productization of the service different service modules are defined. The outline of the modules will help to illustrate the service process. At this point the productized service can be tested and piloted with well planed schedules and processes in cooperation with the pilot customer. The following questions have to be answered: (Ylitalo 2011, 77).

- Does the service meet the customer requirement and needs?
- Are there bugs found?
- Is there any development suggestion?

Once the above questions are ironed out, concretization and marketing takes place where the service is given a name and branded to make it credible, distinguishable and understandable. Besides, Service documentation need to be constructed that contains internal and external materials. (Ylitalo 2011, 78 - 79).

The productized service cannot be sold without pricing. Establish understandable fixed pricing for service offering or service package. Construct pricing strategy and define pricing models used. Additionally, articulate pricing structure for the core service and possible modules and customization of the service. (Ylitalo 2011, 80).

Following the marketing and selling of the productized service follow-up and further development is unavoidable. Design a way to gather customer feedback to facilitate improvement of the service. This will ensure a quality service, leading to customer satisfaction hence increased sales volume. (Ylitalo 2011, 78 - 82).

According to the research done by Service Performance Insight (SPI) there are three major forces that are encouraging service organizations to productize their services (Service Performance Insight, LLC, 2012, 73, date of retrieval 12.09.2013):

- a) Global competition.
- b) Clients' or customers' increasing procurement complexity and
- c) A rapidly changing technology environment.

Primarily, internationalization and increased competition are mounting price pressure by commoditizing services. Service providers are responding by productizing their most commonly delivered services to protect revenues and margins, as well as differentiating to increase them. Moreover productizing service improves resource utilisation and management. (Service Performance Insight, LLC, 2012, 73, date of retrieval 12.09.2013):

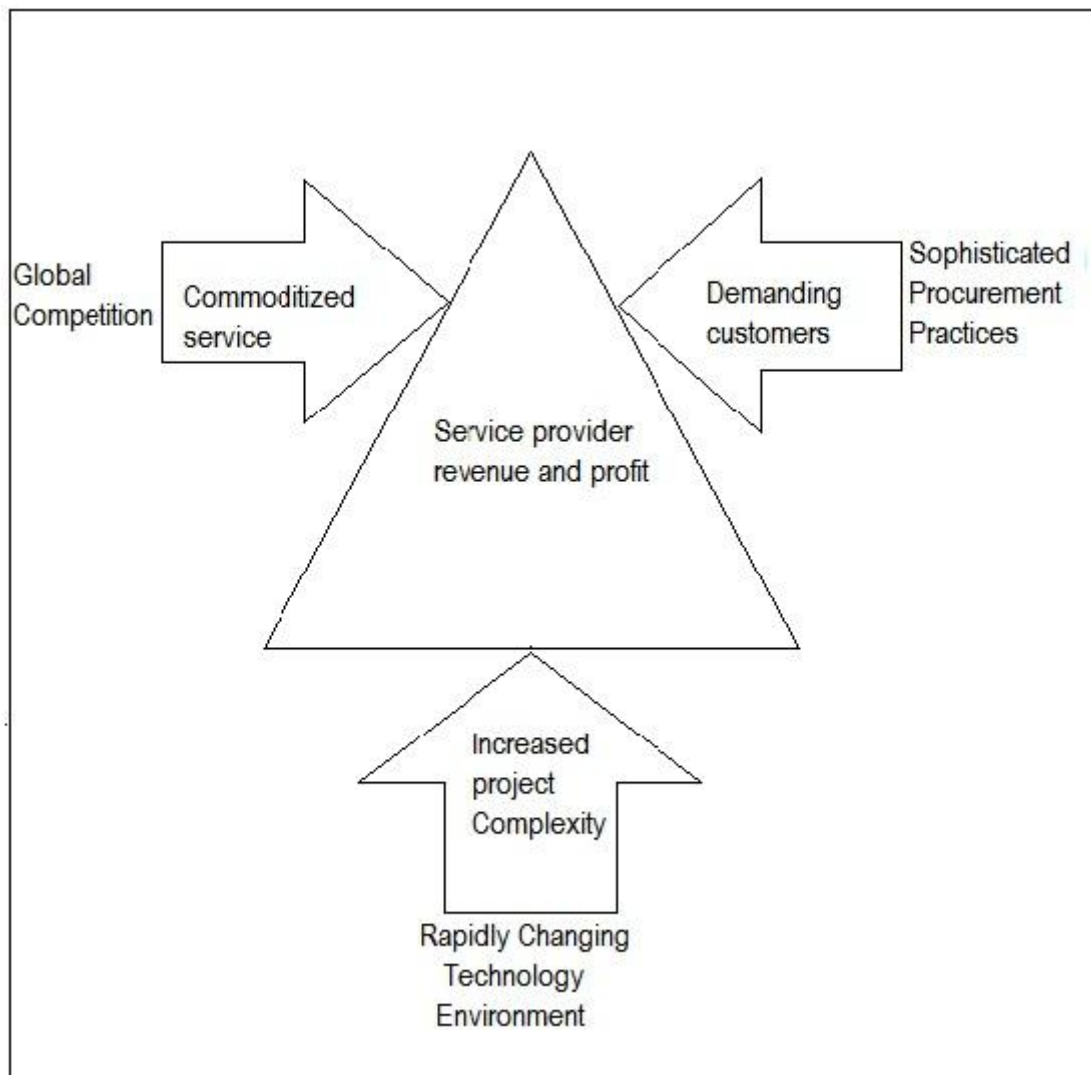
Subsequently, customers are claiming more value for all their purchases. This is fuelled by high adoption of strategic sourcing and complex procurement practises. Customers require plainly defined service descriptions, transparent delivery process, and validated project costs before a commitment is confirmed. In addition, the service market has moved to shift burden of successful outcome to service provider. This is as a result of deliverables-based and fixed price engagements pushing the service provider to productize. (Service Performance Insight, LLC, 2012, 73, date of retrieval 12.09.2013):

Thirdly, the rapidly changing technology environment brings difficulty for both service providers and the customers. Customer preference and needs are always shifting as rapid as the technology. Customers are demanding fast and unique service. On the other hand, service providers are in an awkward situation. They are looking for exclusive ways satisfy the growing customer need in a highly competitive environment. This has provoked the use of sophisticated technology to

enhance business value capture through service productization. (Service Performance Insight, LLC, 2012, 74, date of retrieval 12.09.2013):

The figure below helps to explain visually the above discussion (Service Performance Insight, LLC, 2012, 74, date of retrieval 12.09.2013):

FIGURE 1. Forces driving service productization (Service Performance Insight, LLC, 2012, 74, date of retrieval 12.09.2013):



Service providers are facing numerous challenges to package a service to be attractive to the customer. Service productization done right can increase sales and overall company profitability.

2.2 Productization process

Productization process is a procedure where service's contents, purpose and price is defined and packaged into a systemized service offering (Ylitalo, 2011, 75 date of retrieval 15.09.2013). The process starts with defining the basics of a service and service process. At this point the key thing is to define the customer segments and customers, what kind of services should be offered and what are the needed resources. The productization process is as follows:(Ylitalo 2011).

- Defining customer segments and customers
- Analyze and define the service offering
- Test and piloting of the service
- Concretization and marketing
- Pricing
- Follow-up and further development

Defining customer segments and customers

According to business dictionary (date of retrieval, 12.9.2013) customer segment is a group or a set of similar clients that are related from a marketing or demographic perspective. Customers can be grouped according to their gender, buying tendencies, age group and special interest.

Customer segmentation or market segmentation can be used interchangeably since the customers form a particular market for goods and services. In this context W.R. Smith in early 1956 put forward the following definition:

Segmentation is based on the observation of evaluation in demand and represents a more precise and rational adaptation of the product and marketing efforts made to meet customer or user demand. (Michel, Naude', Salle & Valla, 2003, 169)

Sometimes customer demands within a given segment may differ thus it is unlikely that a single offer can satisfy them all at the same time. Consequently, the service provider may wonder how to recognize the diversity of customer expectation and to organize information in such a way to provide adequate answers. Segmentation technique responds to this question. The technique

helps the management to design the best productization method in terms of standardization or adaptation concession of its offer for each customer segment, given its aims and challenges. The segmentation knowhow involves remembering the following two points: (Michel, Naude', Salle & Valla, 2003, 170)

- Customer dynamism and
- Nature of customers

Knowing the target customer segments for the service is very important. The aim of segmentation is to minimize discrepancy within the group to create 'homogeneous' groups and maximize discrepancy outside the group to create groups which are different from each other. In essence, the objective is to give the service a simplified representation of its market by bringing in the characteristic of customer behavior and customer dynamics that can affect it. Therefore, it becomes easy to understand the customer and the target customer segment is turned into use.

In addition, a portfolio of the target customers is prepared. At this point it is easy to segment the customers in accordance with their needs and problems. In order to comprehend the need and problems of the target customer's market research is vital.

Market research is any systematic effort to gather information about market or customers and analysing of data which is used to solve marketing problems. Market research consists of social and opinion research. It is an organized gathering and interpretation of information about persons or organizations using statistical and analytical methods and skills of the applied social sciences to gain understanding or support decision making. (Kalyan city life 2011, date of retrieval 14.11.2013) A well conducted market research brings out clearly the needs and challenges of the target customer segment.

Appropriate segmentation brings about differentiation in segments with a precise and indentified competition, large enough to earn profit and become operational. Hence, it justifies segregation in the offers, access to the market and in the marketing process. For this reason, it affects service provider strategy and customer approach, marking it the key to the productization process. (Michel et al. 2003, 170 -171)

Analyze and define the service offering

It is important to analyze and define the service offering. Service offering is the initial point for putting together Service Portfolio Management. Service offerings are used to create distinguished levels of service for existing business services through the use of service commitment. (Service now 2013, date of retrieval 09.15.2013). It is important to create service portfolio for effective management. Service group or portfolio helps to identify the most core services that can be productized in accordance to their specifications, resources quality and their meaning to the company. The core service chosen to be productized has to be properly managed as a service package. The service package is divided into two major categories core service and auxiliary services also known as facilitator services. Therefore, the portfolio of services requires good management.

The customer benefit concept states four steps that are required to effectively manage service offering (Grönroos 2000, 164). The first step is to develop the service concept. The service concept determines the intentions of the organization. It defines the aims and objectives of service providers. Secondly, develop a basic service package. Basic service package describes the portfolio of services that are required to fulfill the customer needs in a target market. The third step is to develop an augmented service offering. This forms the service process where the service production and delivery is modelled taking into account the total customer perceived quality of service. Finally, manage image and communication. In order to effectively manage service offering the service provider has to manage corporate and local image as well as marketing communication so that they enhance the perception of the augmented service offering. (Grönroos 2000, 164,).

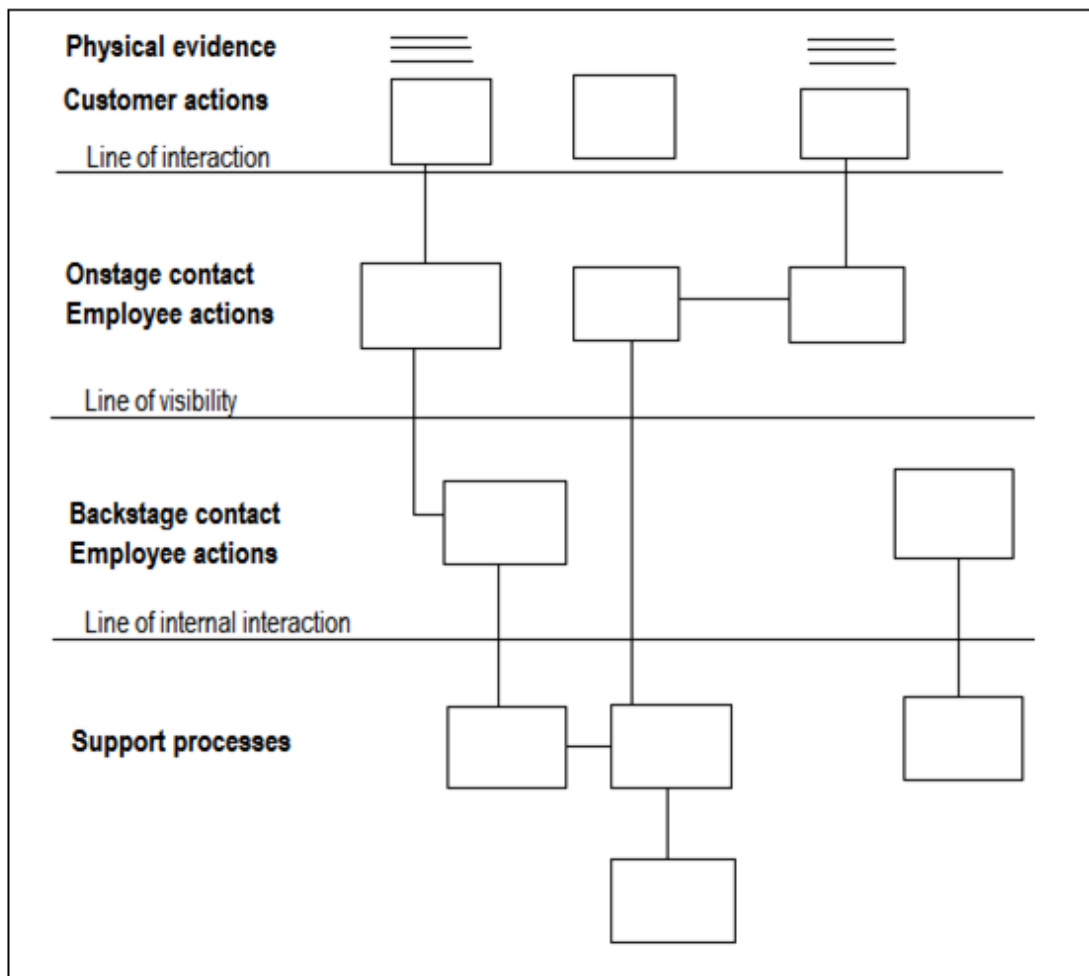
Since, service is described as a wrap up or a collection of various services, tangible and intangible that together forms a service (Grönroos 2000, 164). The above four steps must be followed to the latter in order to standardise and customize services and for the benefits of the service to accrue to the customer. In addition, it is important to define standardised and customized part of the service as well as defining deferent service modules. These facilitate understanding of service offering by the consumers hence buying decisions becomes simpler (Ylitalo 2011, 76).

The process of productization cannot be complete without describing the service process. The service process can be illustrated by use of blueprinting method. Zeithaml define service blue print as follows:

“Service blue print is a picture or a map that accurately portrays the service system so that the different people involved in providing it can understand and deal with it objectively regardless of their roles or their individual point of view”. (Zeithaml et al. 2006, 267)

Therefore, service blue printing can be described as a tool that concurrently illustrates the service process, the point of customer contact and the evidence of a service from the view point of the customer. The figure below shows the components of service blue print.

FIGURE 2. The components of service blue print (Zeithaml et al. 2006, 268).



Testing and piloting the service

Once the service to productize is chosen and service blueprinting done, the next step is to test and pilot the productized service. Choose the pilot customer who will give feedback showing whether customer needs and requirements are met. Testing and piloting schedules and processes are planned in order to give accurate and timely information. Proper communication and well thought out schedules should be arranged between the service provider and the customer while piloting the productized service. As a result, bugs found are ironed out and any development suggestions are put forward. (Ylitalo 2011, 78 - 82).

Concretization and marketing

In the process of productization of service, concretizing makes the service credible, distinguishable and easy to understand. Service concept plays a huge role in concretization and marketing of service. It defines, the what and the how of service creation, as well as guarantees connection among the what and the how. Moreover, the service concept can also help to bring together expectation of the service consumer and the service provider strategic intent. The variance between what the service provider intends to provide (its strategic intent) and what its service consumer expect (customer needs) is one reason for poorly perceived service. While this gap may be of inappropriate marketing in terms of branding the service with distinguishable visual look, or poorly specified or delivered service. This gap may be reduced at the service creation stage. (Goldstein, Johnston, Duffy & Raod 2002 121–134)

Service documentation is essential in concretization and marketing. Construct internal and external documentation of the service. At least take account of the following in the internal documentation of the service: (Ylitalo 2011, 78 date of retrieval 15.09.2013).

- Preface the service by service introduction
- Explains what the service entails by describing the service
- Define the core service as well as support services
- Give details of additional services if their needed to experience the core service
- If there is related service recognize them.
- Spot and document the unique selling point of the service.
- Identify the customer segment targeted by the service.

- Understand the benefit of the service to the customer.
- Document the price range of the service.

External documentation entails service brochures, service white papers quotation drafts and other legal documents that enhance contracts. If the service is public make a price list for the service offering.

Pricing

Gather basic ideas and objective for pricing to constitute pricing strategy. Establish a simple pricing strategy that is understandable by the customer. Pricing determines the perceived image of the service offering. Therefore, consultation and discussions between stakeholders should be held before releasing the price list. Formulate the pricing structure for the service as per the standardized and customized service. The structure enables the service provider to set the price per customer segment hence making it simple.

In pricing, there are some instances when a service may attract a discount. It is advisable to state when, why and how the price cut is offered. This enables the customer to make buying decision easier. For regular customers, price may be discounted to make them loyal to the brand. However price cannot be used to gain competitive advantage. It is not a sustainable advantage because as soon as the competitor offers a low price customer is gone. (Grönroos 2000, 4) For customers who are partners price may be discounted as well. This strengthens the partnership while boosting the service offering.

Follow-up and further development

The purpose of service productization is to satisfy customer needs. In order to understand customer views of the service, follow-up procedures must be established. Customer feedback is essential at this point. The service provider is able to identify areas for further improvements as well as ensure the quality of service is maintained. In addition, sales volume trends analysis is done at the same time possible bugs are ironed out to make the service easy and simple to buy.

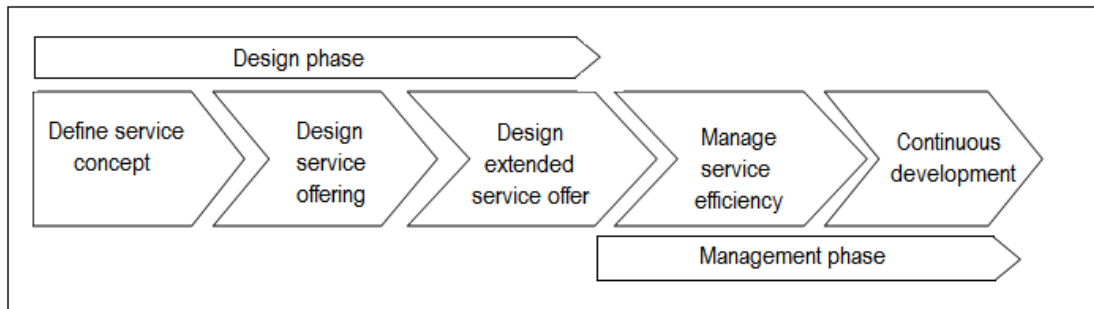
Productization process is a cycle that always leaves a room for further development of the service. When the service offering is productized through the process it becomes easy to offer and simple for the customer to make a buying decision.

2.3 Model for service productization

Currently services are forming a noteworthy percentage of the business activities for a significant number of companies. They are becoming more and more popular with assessment of how efficient and effective these services are. This has triggered companies engaging in service industry to device ways and means to increase output as well as being efficient and effective. At this juncture productization has come in handy.

Even though, it is agreed that providing unique customer service enhance competitive edge and provide more customer satisfaction, it has been argued that productization of service provides a all inclusive customer experience hence increases competitive advantage. It is highlighted that productization does not counter against customer satisfaction in services; rather it aims to deliver the same level of customer fulfillment with a more synchronized process behind it. Productization is a solution to the problem of efficiency and output, since its primary purpose is to enhance salability of a service offering by increasing service attractiveness and likability by optimizing distinguishable features of the service and concentrating on unique selling point. For that reason, productization can be categorized as a process of enabling a concept, idea, or service into salable product by the means of increasing the process efficiency and effectiveness, which is done by articulating service provider operations. Various scholars argue that the benefits of productization do not end when output and efficiency in production increases, rather, in the long term it can even increase sales output, reduce the threats involved, ease the buying decision for the customer, provide more clearness in the offering and essentially facilitate better customization for the customer. (Grönroos 2000, 217). The figure below shows a model for service productization

FIGURE 3. Model for service productization (Tervola. 2010, 42)



Other acknowledged benefits of productization are the facts that; it enables a service provider to discover the actual value adding support services, the service consumer gets a more solid idea of the service range, easier in service pricing, therefore eases the customer buying decision. For these reasons, productization is an important sales enhancing tool for B2B sales productivity. Furthermore, productization can be used as a tool for managing quality.

Successful productization needs a whole service blueprinting and business model analysis, where all the logistics of service delivery are acknowledged and their contribution to service experience are determined and described. Therefore, managers get to understand the service process. According to the above discussion, productization in favorable circumstances can be used as a tool for service development.

2.4 Productization boosting sales of a service

Service organizations are in business to provide knowledge and expertise. Their sales teams must define target clients and provide unique solutions. The job of sales team is to generate awareness and identify and grab opportunities. Services are intangible, therefore, sales workforce has more challenges of creating concrete proof of the service provider knowledge, experience and reputation.

In recent times, service providers are more and more looking for sales and marketing workforce to grow revenues. These sales teams often do not have the service delivery familiarity to actually get to know the nature of the service they are selling. As a results, customer satisfaction issues may arise, unbeneficial customer engagements, and under performance of sale team. In this

respect, productization of services can enhance the development and documentation of the most important selling points and value propositions that sales workforce can use to improve their performance. (Radford 2004, date of retrieval 08.09.2013)

Trust is a very important ingredient in business. Build trust take time and resources. Productization assists in establishment of trust between service provider and service consumer. Service providers need to identify and understand what is important to their customers and be honest and reliable to them hence build trust. Service productization through service blueprint tool identifies the critical path of the service. The identified critical path needs to be well managed to make the service reliable. The more familiar you are with the critical service delivery point, the lesser effort you put to achieve customer trust. Service provider trustworthiness is founded on both the character and competence. Some of the most crucial character traits required to create trustworthiness is integrity and accountability. Productization brings in accountability to a service through dividing service offering into small salable units. In addition, the customer is able to make buying decisions of small service unit hence reducing the customer's risks.

Productization has proven to make the intangible more tangible. Services have one characteristic that completely separate them from goods; intangibility (Zeithaml et al. 2006, 22). A service that has undergone productization process as discussed earlier attains some tangibility features that make the customers able to identify the service offering that suits their needs. In addition, the service provider increases productivity of the service offering simply because the productized service stands out. The service that has been productized has to be consistently delivered to be in-touch with consumer perception and emotions that constitute customer satisfaction. (Zeithaml et al. 2006, 110)

A well done productization protects revenue and margins, as well as provides the differentiation to increase them. It helps the service provider to get constant flow of revenues as the customer is able to make concrete, firm and simple decisions to buy the service. (Radford 2004, date of retrieval 08.09.2013)

2.5 Summary

Services, productization and service productization have been discussed extensively in various perspectives in the previous sub-topics. The essential concern in this research is how productization assists in joint service design in the service creation process; making the service simple, understandable and manageable. The service adaptability and standardization illustrates clearly the rationale of productization (Zeithaml et al. 2006, 128). It is in fact, a move to scale down a service to suit the customer needs. Productization make the service attractive where the delivery process is simplified to full fill the needs and ensure customer satisfaction. Enablers for this process are service design tools such as: Business model canvas, Service blue print, Idea tree, Value proposition canvas and Productization canvas. These tools are very important, they interactively, bring together the providers and consumers of service. The tools are extensively used in creation process of joint service under the platform of UNELMA project.

The service provider and customer interaction define the need for standard set of offering through service productization. As a result, the joint service offering created acquire distinguishable features that enable the sales force to modify the image and the selling arguments of a service offering to adequately address the pursued customer value proposition. A well productized service integrated with properly trained sales employees is able to bring out the actual benefits of a service offering by communicating the benefits of a service that attend to the customer needs in an efficient and effective way. The joint service network stakeholders in the long run gain from productized services through improved efficiency and productivity

Productization can be significant to both service provider and the customer, for a number of reasons ;(SPI, LLC, 2012, 76)

- it concretizes the offered solution,
- it lowers the customer's risk level,
- it enhances the service quality and
- it makes the whole service process flow smoothly and more efficiently.

The intent to summarize the literature is to show how in theory, productization can enhance joint service creation process in a complex B2B service environment and how it supports service offering in sales and marketing. Furthermore, productization of service offering helps the internal

processes, external processes, as well as methods, tools and structures to be standardized thus increasing the customer perceived value in the service offering. (Tervola 2010, 41)

A well managed productization process actually enables customer point of reference and enhances customer value proposition by lowering the time spent on regular issue thus leaving time for customer specific actions. However, it is not feasible to design a perfect productization process where even the trivial elements are adjusted to fit the process in the name of efficiency and effectiveness. Likewise, complexity theory argues against this situation by stating that such a system or a process will without doubt be tough to establish, complex to manage and too rigid and clumsy to fine-tune to the changing market conditions. (Tervola 2010, 41)

According to the literature reviewed, productization proves to assist in establishment of joint service network that is simple, understandable and manageable. It aids the customer to make informed and quick decisions in the buying process, therefore increasing sales for service providers.

3 RESEARCH METHODOLOGY

This chapter describes the methodological approach used in the study. It includes research methods and data collection techniques. In addition, justification for the chosen research methods and techniques is provided. Also, validity and reliability of the study is discussed.

3.1 Research approach and strategy

Researchers have to consider a number of factors before choosing the research approach to adapt to the research in question. The approach depends on: (Yin 1994, 4 -9 & Ghauri 2002, 172)

- the type of research in question;
- the control of the researcher on behavioral events;
- the focus on the current as opposed to historical phenomenon;
- what information is needed;
- how this can be obtained.

Therefore, before commencement of the research, the researcher has to thoroughly understand the subject and the area of study in order to choose the right study approach. Some situations may have no clearly preferred strategy as the strengths and weaknesses of various methods may overlap. The basic approach, however, is to consider all strategies in a pluralistic manner (Yin 1994, 15). The study approach strategy can be single method or a combination of two or more methods of data collection. In this thesis the main approach is case study method, supported by other qualitative data collection methods such as; observation and workshops.

This research can be categorized as exploratory and descriptive case study (Yin 1994, 1). The UNELMA case study involves joint service concept that deals with a network of service providers and customers in high tech technology. The research is focused on the real practical problems and challenges solving approach of real life organizations involved in networked service. The business environment has become competitive and customer needs are becoming extensive, prompting the companies and organizations to develop integrated solutions. Organizations and companies struggle to co-create effective solutions that meet customer needs (Hakanen & Jaakkola 2012, 593 - 595). This research is focused on joint service concept and critical factors affecting customer focused solutions within UNELMA service network.

Case study is among the most used approach in business studies research. Case study is a description of management situation. It's often involves data collection through a number of sources such as verbal report, personal interviews and observation as primary data source. Moreover, some other secondary sources of data are involved in case study such as, financial reports, operating statements and budgets, archives, as well as market and competition reports (Ghauri 2002, 171 - 172). It is a useful method when "how" or "why" questions are being answered and when the area of the research is relatively less known, and the researcher is engaged in theory-building types of research (Yin 1994, 1, Ghauri 2002, 172) Case study as a method of research is not suitable for all type of research. Research problem, aims and objective are the main consideration to decide whether the case method is suitable or not. (Ghauri 2002, 90)

According to Ghauri, case studies are often of an explanatory, exploratory or descriptive nature. Ghauri agrees with Eisenhardt views of case studies that they are;

particularly well-suited to new research areas for which existing theory seems inadequate. This type of work is highly complementary to incremental theory building from normal science research. The former is useful in early stages of research on a topic or when a fresh perspective is needed, while the latter is useful in later stages of knowledge. (Ghauri 2002, 172.)

Case studies mainly focus on one particular happening and cannot be used as a source of information for such related project. Every project or study has its own variables. In this case, the study is based on UNELMA-project. As discussed before with single-case study, one does not get enough information to compare and make generalization. Therefore, in this case study the objective is to deeply understand the prevailing processes in productization in the context of the UNELMA-project and to make suggestions and recommendation targeted only to this particular project.

Case study is a preferred method in UNELMA-project because the study situation has rarely been studied and the project is unique in its nature. In this case it is hoped that the researcher and the stakeholders will learn something new and important (Ghauri 2002, 173).

This thesis focuses on the case study method supported by qualitative method of collecting data. The main reasons of using qualitative methods are the objective of the research project, the

background, time and the resources available. In addition, the research problem, the focus and purpose of the study are other reasons considered. Qualitative method is suitable for studying organizations, groups and individuals according to (Strauss and Corbin 1990 emphasized by Ghauri 2002, 87). Ghauri has echoed the views of Van Maanen, 1983; Strauss and Corbin that the skills needed to do qualitative research are thinking abstractly, stepping back and critically analyzing situations, recognizing and avoiding biases, obtaining valid and reliable information, having theoretical and social sensitivity and ability to keep analytical distance while at the same time utilizing past experience and having sharp sense of observation and interaction. (Ghauri 2002, 86)

Qualitative research has three components. They are data, analytical procedures and report (Ghauri 2002, 87). Through interviews, workshops and observations data is collected and interpreted conceptually to arrive at findings or theories that are presented in form of report that can be verbal or written. According to (Silverman 1993, 8 - 9) qualitative researchers use four major methods to collect data. These are:

- Observation - often used to fundamentally understand another culture.
- Analyzing text and documents – assist to understand participants' categories.
- Interviews- 'Open ended' questions are prepared to small samples.
- Recording and transcribing- useful when understanding how the participants organize their talk.

The above methods are mostly combined. For instance, many case studies combine observation and interviewing. However, the overall nature of the research methodology shapes how each method is used.

Traditionally qualitative research has been viewed as a minor methodology to be used in exploratory stages of a study. Silverman continues to argue that qualitative research can be used to familiarize oneself with a setting before the serious sampling and counting begins (Silverman 1993, 20). In the early days quantitative research was viewed as the standard form as Silverman emphasizes in the text below.

The inspection of nonquantified data may be particularly helpful if it is done periodically throughout a study rather than postponed to the end of the statistical analysis. Frequently, a single incident noted by a perceptive observer contains the clue to an understanding of a phenomenon. If the social scientist becomes aware of this implication at a moment

when he can still add to his material or exploit further the data he has already collected, he may considerably enrich the quality of his conclusions. (Silverman 1993, 20).

Despite the subordinate view by the traditional approach of data collection, qualitative research has gain support in recent times. The method has been very useful nowadays in various researches as the major methodology of study. In this context, qualitative data are attractive for various reasons: They are rich, full, earthly, holistic, and real; their face validity seems above reproach, they preserve chronological flow where that is significant, and suffer minimally from retrospective misrepresentation; and they, in principle, offer a far more precise way to assess causality in organizational affairs than hidden efforts like intertwined correlations. (Ghuri 2002, 87)

3.2 Data collection

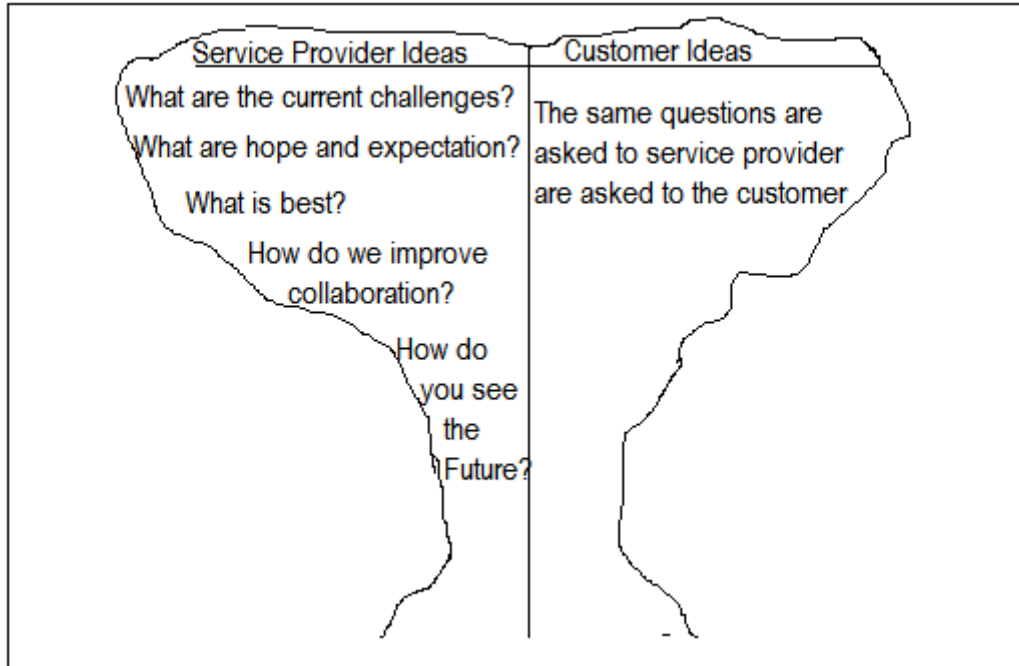
As described earlier there are mainly six commonly used sources of evidence in case study research (Yin 1994, 78). They are as follows: documentation, archival records, interviews, direct observation, participant observation, and physical artifacts. Data collection for the theoretical background of this thesis is accomplished through deep understanding of written theory of productization, high-tech innovative product, co-creating service business network and service management and marketing. Data collection for the case project (UNELMA-project) is carried out through, workshops (service design tools), direct observation and participant observation. Moreover, analyzing verbal and written reports and other related project documents, such as articles, specifications, project plans, descriptions, and other related documents. Most of these materials can be accessed by public; however, some of them are UNELMA-project confidential.

To achieve the purpose of the study for this thesis service creation tools were considered appropriate to collect data. These tools are:

- Idea tree,
- Business model canvas,
- Service blueprinting tool,
- Value Proposition canvas and
- Productization canvas.

The Idea tree is used in brainstorming of thoughts. It is a tool of wisdom where participants share what they know and create visual thought. (My idea tree 2013, date of retrieval 17.11.2013) The tree helps to connect various ideas and show how the ideas relate to each other. See the figure below.

FIGURE 4. Idea tree ((My idea tree 2013, date of retrieval 17.11.2013)



The tree can be designed to ask questions otherwise could be asked in unstructured or structured interview. The researcher is able to interact with the participant freely and in a relaxed manner. In this aspect it has an advantage over the interview. The answers given to the set questions are compared and contrasted to provide relevant information to the researcher. In this research the service provider and the customer were ask questions by use of idea tree where information is gathered and analyzed. See appendix 2

Business Model Canvas is a strategic management tool that is designed to convey the essentials of what you need to know, quickly, simply, and in a visual format. It allows describing, designing, challenging, inventing and pivoting organization's business model. In addition it describes the rationale of how the organization creates; delivers and captures value (Osterwalder & Pigneur 2010, 14). In this thesis the model has been used to collect crucial information such as customer

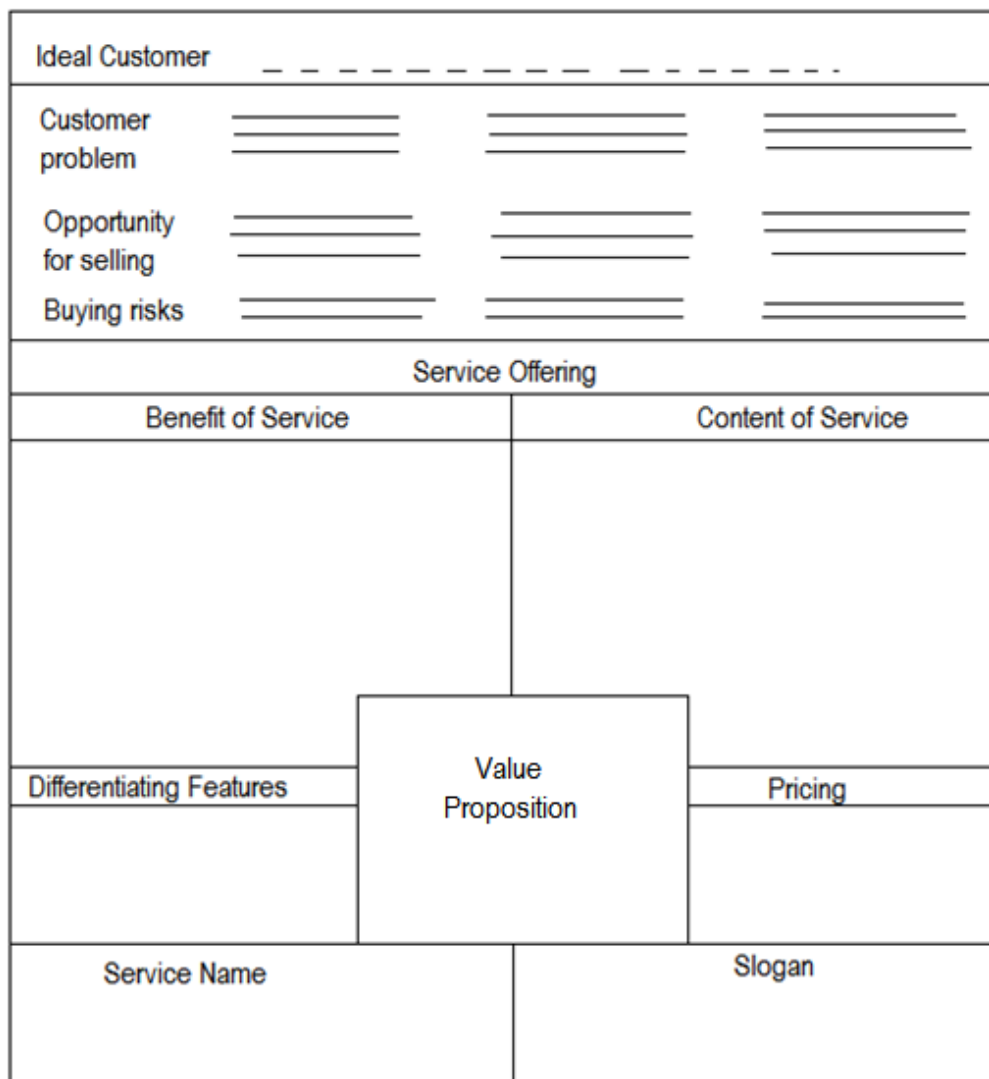
value proposition, key customer activity and customer relationship among others has shown in appendix 3.

Service Blueprinting Tool is used for service innovation. The tool shows processes within an organization divided into different components. Ideally the components are: Customer action, Front stage (visible contacts employee) action, Back stage (invisible contacts employees) action, Support process and Physical evidence. (Zeithaml et al. 2006, 268) UNELMA-project involves a network of service providers and customers. In order to design joint service concept, service blueprint for service providers is inevitable. This tool has been used to collect information in this research. OUAS project team was able to establish service process and the critical point of the service providers. See appendix 4

Value proposition is a promise of value to be delivered and a belief from the customer that value will be experienced. It can apply to an entire organization, or part of it, customer accounts or products and services. Value proposition canvas describes how organizations products and services create customer gains and benefits. (Business model generation 2010, date of retrieval 17.11.2013). This canvas has been used UNELMA project to derive information about stakeholder's expectation of the network service. See appendix 5

Productization Canvas is a tool used to specify and standardize the service offering. The canvas helps to tangibilize and concretize the service offering and systemize standard processes and methods. The figure below shows a model of productization canvas.

FIGURE 5. Productization canvas (Lapinlahti, Vesala & Törmänen, M. 2013 date of retrieval 17.11.2013)



The tool enables to translate the abstract service and its creation into exchangeable objects and controllable processes. (Lapinlahti, Vesala & Törmänen, M. 2013 date of retrieval 17.11.2013) Service productization and concretization is achieved through the use of this tool. See appendix 6

The tools discussed above have been used during UNELMA-project design and creation phases. to disseminate information through organised workshops. Participants in these workshops are

service providers, customers and the researchers. All known as UNELMA-project stakeholders. The author of this thesis has participated in the following workshops:

- MNT review workshop held on 19th August 2013
- Customer workshop MNT held on 10th September 2013
- Exploration workshop in Sweden Swerea Sicomp 25th September 2013
- Creation workshop Kemi held 15th October 2013

See appendix 1

The data collected throughout the process is qualitative. Exploratory data analysis has been used to analyze and interpret data. There are two methods non graphical or graphical. Non graphical exploratory data analysis involves calculation of summary statistics. Graphical exploratory data analysis involves summarizing the data in a diagrammatic or pictorial way. (Mellon 2014, 62 date of retrieval 30.03.2014). Graphical method has been used to analyze data in UNELMA-project case study through joint service creation tools (Idea tree, Business model canvas, Service blueprinting tool, Value Proposition canvas and Productization canvas). Moreover, analysis of the research material and data is conducted through blending it to the theoretical background information to be able draw conclusions concerning the case project. Synthesizing the collected qualitative data together with the written theory about productization requires comprehensive analysis in order to be able to get the results in use for the case project. The challenge with the integrated methods used to gather data in this research (workshops, observation and service creation tools) is that while they are potentially a rich source of data, they suffer from limitations and biases. Workshops can easily slip into imposing questions to the participants, such that the researcher asks selective questions to get the intended answers. Even a time the discussion may go out of norms and frameworks of the workshop losing the aim for objective understanding. The risk is that research session may take a lot of time discussing a single issue. In this study the risk of subjectivity is evident since the present author, as a researcher, is among the participants of OUAS team. The team is task to create a joint service network of UNELMA-project that is the object of the research. The fact that the researcher participates in joint service network creation of the case project researched is also an advantage. As it was pointed out before, the author has the access to information, documents and tacit knowledge that otherwise, for an outsider could be inaccessible.

3.3 Triangulation approach

Triangulation approach is where the study in question uses more than one method to get information in order to enhance confidence in the findings (Bryman, 2014 date of retrieval 30.03.2014). This thesis has used case study method together with qualitative method to investigate the research question.

Moreover, reliability and validity has been observed in this study. Reliability refers to the likelihood of achieving related outcome with the same research procedure. In other words, it refers to the degree of consistency of results if the research is repeated (Silverman 1993, 145). Thus, reliability emphasizes the need for an unambiguous research method. Validity, in contrast, measures the credibility of the attained results. It shows the probability that the intended research question has been answered by the research results (Silverman 1993, 149). Validity is emphasized by how true the description holds, how good is the interpretation, the adequacy of suggested theory on explanation and to what extent the findings from the study can be generalized (Ghauri 2002, 129). It is argued that, reliability is actually the outcome of validity in a qualitative study.

Yin gives three principles of data collection to enhance the reliability of a case study, which are: the use of a multiple sources of evidence, developing a case study database and maintaining a chain of evidence (Yin 1994, 90-100). In this study a research plan, workshop materials and case study protocols were used and workshop diary was kept. These put together the study procedure of this research. There was a single research database or a platform used (OUAS Moodle), where all the relevant files and documents were stored during the case project study. Validity can be categorized into two; external validity and construct validity. The construct validity determines how well the right operational procedures for the concept being studied are acknowledged. Yin proposes several ways how to get better construct validity, which are using several sources of evidence. Establishing a chain of evidence and letting the stakeholders review the draft of the study report are some of the suggestions. In this study, the above pointed out measures were taken in order to advance the construct validity in this research. External validity determines how well the attained outcome can be generalized beyond the scope of the case study. Yin recommends building of hypothesis for single-case studies as an approach to increase the external validity. (Yin 1994, 90-100) This has been taken care of in the study, since several theories are combined to show how productization can aid in service design, which is hypothesized to fit to

other like case projects. The subject of generalization is also a part of the research procedure of the case study research, and it is likewise discussed in conclusion of the study.

4 CASE STUDY OF UNELMA-PROJECT

The purpose of the productization of UNELMA-project is to aid in joint service creation such that the service's content, purpose and price is defined and packaged into systemized service offering, to make it manageable and understandable. This chapter looks at the case project background, followed by analysis of stakeholder's expectation and finally service is concretization.

4.1 Background

Companies are not often aware of how to efficiently and effectively utilize the resources of the universities and research institutes in their daily operations. Time and again they point out difficulties and lack of clear procedures and guideline how to engage with research institutes when an identified research need arises (UNELMA-project plan 2011). Moreover, small start-up companies investing millions for research and development proves to be challenging. Therefore, the research facilities at universities and institutes within the Bothnian Arc decided to come up with way to fulfill the urgent R&D needs. This was the birth of UNELMA-project. The case project was task to build a high-tech joint service concept within the Bothnian Arc. The participating universities and research institutes in the region are in Oulu, the Kemi-Tornio area, Lulea and Pitea.

The project is expected to achieve the following results: (UNELMA-project plan 2011)

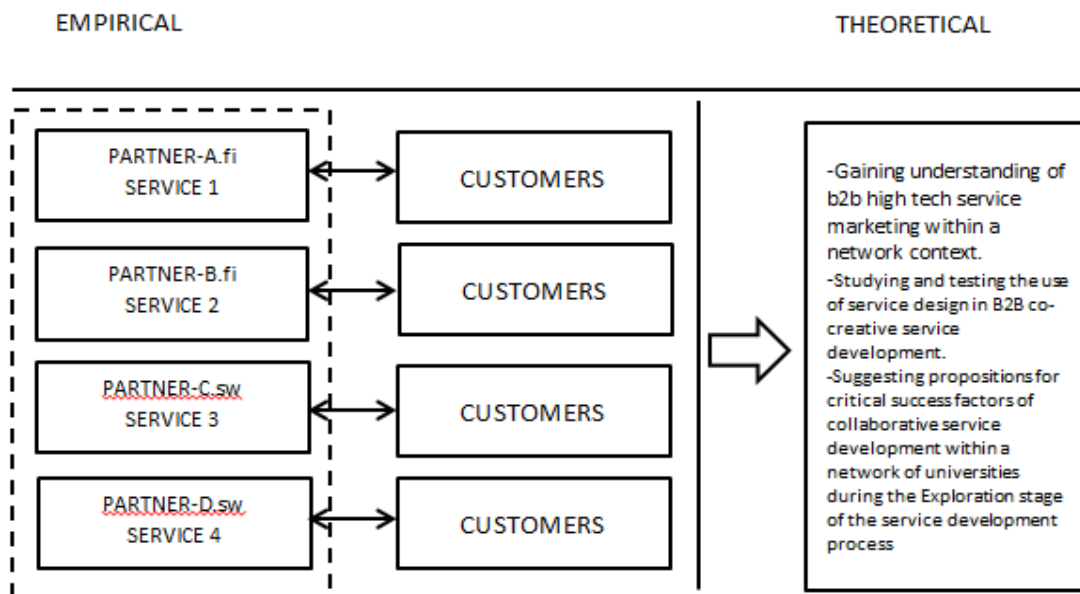
- A new joint service concept for materials imaging and analysis for local universities and research institutes expected to eliminate current bottlenecks and hindrances in the provision of these services.
- Improve quality and scope of applied research services in partner organization.
- Increase mutual knowledge of the requirement and practices of these R&D services amongst the facility investment.
- Improve dissemination of micro-and nanotechnology research and thus activation of companies in the utilization of this information in their R&D
- Strengthen co-operation between universities and industry and, consequently efficient network develop between them.
- Improved competitiveness of local industries and companies

- Provide ready to use material/structure/product characterization “packages” that can be offered to companies.
- Build an electronic database with a description of methods, equipment and organizations that can provide such services.

Therefore, the UNELMA project will improve the availability and accessibility of the materials imaging and analysis services. The combined palette of these services and the devices, facilities and staff expertise of the participating partner universities and research institutes will be conceptualized so that it will function as one big networked laboratory and service cluster. (UNELMA Project Plan, 2011)

4.2 Analysis of Stakeholders expectations

The networked joint service concept developed under UNELMA-project is expected to significantly benefit both Universities and the industry. It will offer the customers the required expertise and related infrastructure in various materials analyses, characterization and imaging technology needs. This service concept will provide a platform for service providers to easily engage with the customers. Figure 6 below show the process of joint service creation and the expected future outcome of the service



---- = the future joint service concept for the research labs

FIGURE 6. Designing a joint service concept for a high-tech network (Vuorela, Ahola, Väänänen & Saukko, 2013)

In order to get in-depth understanding of the stakeholder's expectation, it is worthwhile to categorize their expectation into two; the service providers and the service consumer (customers) expectations. Idea tree has been used during the workshop to provide information of hope and aspiration of the stakeholders. See appendix 2.

Service providers have various hope and aspiration once the project is concluded and the joint service created. During the customer workshop it emerged that improved collaboration is very crucial for the success of the joint service network. Reliable problem solving, co-operation agreement, knowledge sharing, expertise swapping within the network and quick service were identified as the element that will fuel tight relationship between the service provider themselves and/or as well as between the customers. Furthermore, the beneficiaries of the network will enjoy expertise, flexibility, better and reliable devices and the personal contact that will increase trust among the joint service network users. These are strengths that are attributable to the joint service network.

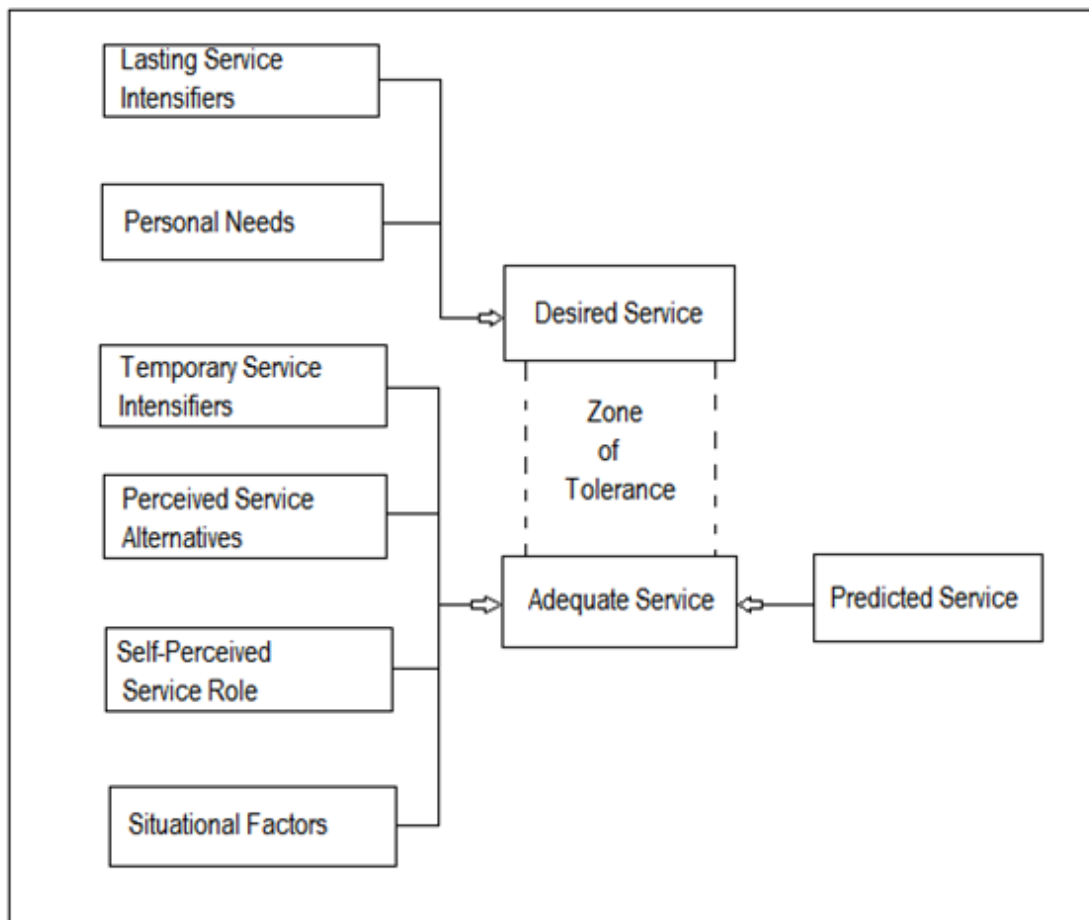
Once the created joint service network is in place, the providers of the service see a huge customer base and large number of partners. The network will be marketing platform for stakeholder's services thus increase customer base hence more business profitability. In addition, the joint service network provides partnership in business therefore; competition is suppressed while promoting co-operation and complementation. To sum it all, the service providers will enjoy long standing customer relationship that characterized by confidence and trust among created joint service stakeholders.

Besides the benefits of joint service network, various challenges are anticipated. They are identified as jurisdiction matter, funding system, complex technology, random nature of service, time when service is required and the high cost of devices coupled by high operator skills as the major challenges of the joint service network. Despite the challenges, the joint service network future seems bright. It is expected there will be continuous improvement of the facilities, provision of better services through the network and joint undertaking of EU project involving stakeholders of

the joint service network. Consequently in future, the service providers under the umbrella of joint service network will continue to offer quality and reliable service.

Service consumer (customer) has a fair share of joint service expectation as well. According Zeithaml there are five factors that influence adequate service expectation as shown in figure four below.

FIGURE 7. Factors that influence adequate service (Zeithaml et al. 2006, 89)



A temporary service intensifier is the first set of element that influences service expectation. It consists of short-term, individual factors that influence the customer desire and awareness of the need for service. Personal urgent situation that needs a service raises the level of adequate service expectations. In situations where temporary service intensifiers are present, the level of adequate service will increase and zone of tolerance will narrow. Customers of joint service network

developed by UNELMA-project require a high level of responsiveness to their emergency problems that will be timely fixed.

Perceived service alternatives, these are other service providers the customer can obtain the service from. The joint service customer network believes that the created service will cater for their needs hence no perceived service alternative at least in Northern Scandinavia and Finland.

The third factor that affects adequate service expectation is *customer's self-perceived service role*. This is the degree to which the customer influences the level of service they receive. Therefore, customer expectations are partly shaped by how well they believe they are performing their own role in service delivered to them. During UNELMA-project exploration phase service blueprint tool showed that customers visit laboratories to check on work progress, playing a role of consulting and giving advice to the service provider. Customers of joint service network expect to influence the service they receive through adequate discussions.

Situation factors also affect the level of adequate service. These are factors seen as beyond service provider's control. Situation factors lower the level of adequate service expectation and widen the zone of tolerance. This research has shown machine breakdown as a challenge to the network hence contingency plans should be in place. However, the stakeholders believe the joint service network will handle situation factors.

Finally, *predicted service* is a factor that influences adequate service expectations. This is the level of service that the customer considers as likely to get. In other words, it is objective calculation of the probability of performance level. Predictions concerns individual service encounters, for this reason, they are likely to be more concrete and specific than the types of expectation levels customers hold for adequate service or desired service. Due to customer experiences in the joint service network the level of predictability of service will be enhanced and reliability and trust boosted.

In addition to the above discussions, the customer would like to see improve collaboration enhanced by the joint service network. Establishment of simple job or task definition that is consistent and improved technology capabilities throughout the network is seen as ingredients for cooperation by the customer. Moreover, the customer advocates for change of attitude among the

decisions makers within the network, by reduction of bureaucracy and promoting unofficial co-operation. This will prompt the joint service stakeholders to provide the best in terms of expertise and boost personal attitude towards task at hand. It is also expected to provide reasonable price, rapid feedback and local support to customers.

Once the joint service is up and running, the customer hopes for common development of ideas and information processing that is solid enough to counter the anticipated more complex task in high-tech industry that is dynamic coupled with every day innovations. The customer sees the creation of joint service network as the solution to most of the problem. On the other hand, the joint service has its own challenges. Personal developed ideas, products and processes among the stakeholders of the network are seen as an headache. The challenge is who owns the ideas and how the ideas are protected. In addition, stakeholders have different priorities for various tasks, therefore maintaining knowledge and service prove to be a test.

Notwithstanding the challenges, joint service network is seen as the future of high-tech industry. The network will bring more solutions to customer problems hence more business partnership that will increase collaboration and cooperation. The customer expect a 'one stop shop' once the joint service network is in place.

Both service providers and customers have a huge expectation for this model of a service. As the researcher identified in various workshops held in the course of joint service creation process, all the stakeholders see the service model as the solution to problems and challenges of dynamic high-tech industry. They anticipate building synergy that will catapult them into a bright future.

4.3 Concretization

Service concretization involves making the service credible, distinguishable and easy to understand. The conventional way to concretize the service is branding the service with distinguishable visual looks and integrated with supplementary materials explaining the service.

During the creation workshop productization canvas aided in concretization of UNELMA-project joint service creation. Figure 8 below shows the findings of the productization canvas used in UNELMA-project workshop.

FIGURE 7. UNELMA-project Productization Canvas (modified from Hasardi Productization Canvas)

Ideal Customer	High-tech companies in Northern Scandinavia and Finland, Growth oriented SME's	
Customer problem	Inadequate information, Resources, Equipment and lack of understanding of root cause of a problem	
Opportunity for selling	Pilot project and Consultancy check	
Buying Risks	High cost, Quality(no standard system), Dead Research and Confidential information	
Service Offering		
Benefit of Service		Content of Service
Equipment and Resources availability More solutions, answers to problems and challenges No or less investment in expensive Equipment		Surface investigation, Analysis of material properties, IC modification and PCB prototypes, Computer aided design (CAD) and numerical simulation and Failure and damage tolerance analysis
Differentiating Features		Pricing
Locality, Joint operated network and quick solutions		Based on hourly rate for routine work, Awareness of Customer business Logic
Service Name		Slogan
Applied Imaging Network abbreviated A.I.N		'MANY SOLUTIONS ONE NETWORK'

The service documentation has been constructed that involves internal materials and external materials. The joint service network created has been branded Applied Imaging Network (A.I.N) operating in Northern Scandinavia and Finland region. It will be dealing with established high-tech companies and growth oriented SME's. The two categories of customers have problems and challenges that the network is expected to deal with. They range from; not understanding of the root cause of the problem, inadequate equipment and resources, lack of enough information and other developmental challenges. To solve these problems and challenges AIN services have been established as described in service palette. See appendix 6. AIN services illustrate how im-

aging equipment, analyzing techniques and knowledge of universities can be used to develop materials and products that match the requirement of the technology companies. The services mostly solve various technical problems in R&D and product analysis phases as well as in quality control. Therefore, AIN will shorten time needed to introduce new materials and innovative products on the market. The following are the core services of AIN in summary, (for details see appendix 7) they are:

- Surface investigation.
- Analysis of material properties.
- IC modification and PCB prototypes.
- Computer aided design (CAD) and numerical simulation.
- Failure and damage tolerance

The joint service network energy will be focused on the above core services. However, in the process of attending to the main services, there will be many other auxiliary services that are related to the core services. They enable the network to meet customer needs in the best way possible. AIN through collaboration and cooperation will share knowledge and expertise to arrive to intended results. Service providers and customers will interact from time to time during problem solving and any other task at hand. This kind of interaction supports the delivery of core service. The network can offer various services in high-tech industry exclusively in Northern Scandinavia and Finland region. For this reason, AIN productized service characteristics and the placement of the service is a unique selling point. The network service providers have an opportunity for selling through pilot cases and use of consultancy check technique to reach out to the target customer segment. The customer segment will benefit from AIN services in the following way; availability of resources and equipment, adequate and on time answers to problems and challenges and less or no investment in expensive measurement and analytical equipments.

Despite the benefit, the customer has various risks ranging from research without positive results (dead head Research), job costing challenges and confidentiality of information relating to innovative products. These pose a buying risk to the AIN service consumers. However, the benefit of AIN services supersedes the risks.

In form of external documentation, AIN service providers will identify a customer to pilot the created joint service network. The customer will be a case study that references the service. Service brochures and service white papers will be created from the service palette discussed above. The

major challenge of AIN is pricing. Prices in the industry are regulated and should be done with consultation with industry regulators. However, prices can be pegged on hourly rate for routine work and negotiations to arrive to agreeable price on other unusual tasks. Moreover, awareness of customer business logic will enable service provider to price the service.

When the customer value proposition is delivered, AIN customer sees value for money on the service offering. The service provider value proposition in summary is; wide scope of equipment, knowledge and expertise in high-tech technology. In the process of concretization and marketing it is ideal to create a slogan. Here is an example of AIN slogan; 'MANY SOLUTIONS ONE NETWORK'.

With the above concretization of AIN joint service, the services offered are expected to Standout and become simple and easy for the customer to make a buying decision.

5 CONCLUSION

Productization is an important concept in the current business world especially in service industry. This thesis has explored productization on a different approach. The research emphasizes on how productization enhances joint service creation. The methodology used is qualitative research method integrated with a case study. The data has been collected through workshops, observations, analyzing verbal and written reports and other related project documents, such as articles, specifications, project plans and other UNELMA-project descriptions. In addition, service creation tools have been extensively used to understand stakeholder's expectation. A combination of all these methods has provided adequate information to make conclusion. In addition, service productization literature brings clear understanding of how productization enhances creation process of joint service network. It shows critical success factors of productization process which are the foundation of this research.

The stakeholders of the UNELMA-project expect significant benefit from the joint service network. The customers anticipate getting the required expertise and related infrastructure in various materials analyses, characterization and imaging technology needs once the network is in place. Moreover, the service provider sees the joint service network as a good platform to easily engage with the customers. Both service provider and the customer expect the joint service created will offer solutions to the dynamic problems and challenges of the industry. Productization canvas findings show how service provider understands the challenges and problem of the customer and how to solve them through simple and easy to understand service offering.

UNELMA-project joint service network can utilize the identified success factors and deal with possible challenges of productization of AIN services. AIN recognition of critical factors for the success of joint service network is prerequisite for its existence into the future. The high-tech industry is dynamic and complex putting extra pressure to service providers to meet rapidly changing customer needs. Moreover, quality and standard are ingredients of this industry. Therefore, productization helps to maintain quality and standard thus making the service manageable and understandable. Service providers have to pay close attention to quality and standard has per customer needs and regulation requirements for joint service network to be successful.

Successful productization is a combination of various factors. Method used, time and commitment are top list factors. It's essential for service provider to understand the service that needs to be productized and who is or are the target customers. This will define the approach to use to successfully productize the service. In the case UNELMA-project, joint service network targets high-tech customers in Northern Scandinavia and Finland as well as growth oriented SME's. The network is fully aware of customer problems and the service providers have seen opportunity to sell through pilot project and consultancy check. AIN stakeholders have a foreseeable benefit of available resources, equipment, solutions and answers to their challenges. Consequently, AIN stakeholders will enjoy wide scope of equipment, knowledge, expertise and solid service as their value proposition.

Service productization enhances joint service creation for research laboratories. Data collected through service creation tools specifically; value proposition canvas and productization canvas have provided very important information for creation of joint service network. These tools have assisted in productization and concretization of joint service network. They have shown how the service will benefit service provider as well as the customer. The marketing of AIN services will be simple because the service has been productized and concretized. The services will be easy to understand and simple for the customer to make buying decision. In effect AIN will sell more services thus increase sales.

In my opinion I suggest the management team of AIN take into account the following recommendation during implementation phase of UNELMA-project.

- Full commitment to the vision, mission and values of AIN.
- Careful choice of pilot customer because the customer is the reference point to the service.
- Adequate time to test the joint service network created for all stakeholders to jell into the network.
- To come up with a detailed and exhaustive AIN pricing strategy since price is the most important element of revenue.
- Review of the productized service from time to time once the network is in place.

6 DISCUSSION

Service creation needs more time, resources and commitment of all stakeholders. The constraints of time and resources have influenced the choice of research method in this case project. Workshops participation and observation played a big role in data collection method. It enabled me to understand stakeholder's expectation of joint service network. In addition, the project has some international aspect where we visited stakeholders in Sweden. Thus, I gained international point of view and experience from the discussions with several participants in the workshop who have contributed to the research topic. The information gathered in Sweden has contributed to the results presented in case project. Participating in this project has given me a clear understanding of the research topic within the UNELMA-project. The analysis and interpretations in terms of the research questions are contributed to by my knowledge of the business environment of stakeholders and the creation of joint service network.

The theoretical area covered in this thesis is not limited, however the practical part and the data collection is restricted to UNELMA-project stakeholders. Data is collected qualitatively through; workshops (service creation tool) and observation. Results of this study are limited to the information obtained from project articles, documents; notes taken during the four workshops participated by the author and the observation done.

The conclusion and recommendations of this study could be concrete if; qualitative research method is used alongside quantitative research method. On the other hand, time and resources were limited to the existent of considering merely qualitative research method. Conclusion and recommendation have been reached after exploratory data analysis and interpretation of service creation tools data. However, data collection method, time and limited resources may have influence the conclusions of this study and the recommendations their given. Recommendations are limited to UNELMA-project service providers even though there is no clear explanation why the same cannot be used in another related project

The results specifically target UNELMA-project stakeholders. However, the study has contributed to the world of academic on a different approach of service productization. As the author of this

thesis I have learnt the use of service creation tools to create a service that is understandable and manageable. I would like to recommend further research on tangibilization of service.

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APPENDICES

APPENDIX 1

WORKSHOPS DIARY

Workshop 1. MNT Familiarization and introduction of my thesis workshop

19.08.2013

Introduction to service provider- for the first time I got to know MNT as service providers in the network and met with project leaders.

Got to know what the service provider core business

Discussion of service provider expectation of the project- The service provider expects integration among all stakeholders of the project to gain competitive advantage. Not to be in competition but to complement and strengthens each other.

MNT representative point out that pricing is a challenge considering the manner and the complexity of the service they offer.

I presented my thesis topic to the service provider MNT; Service productization as an aid to joint service design for research laboratories.

Workshop 2. Customer Workshop MNT 10.09.2013

Participant were introduced to the customer

Customer workshop was to understand the customer view point of the joint service design

Three service design tools were used:

- 1) Idea tree – Both service provider and customer views were collected by this tool.
- 2) Business Model Canvas (BMC) - Participating Customer's business model understanding was aided by this tool.
- 3) Service blue print – Provided information about service provider service pathway and point of contact from the initial stages to the final stage of

billing including filling and actions of both service provider and customer during the service process.

Customer expectation and service provider expectation were allied and discussed to see how well the joint service being created under UNELMA-project can make them a reality.

Workshop 3. Exploration Workshop Swerea Sicomp-Sweden 25.09.2013

Service provider and customer from Sweden side were introduced

The workshop participant got to know the service provider core business as well as customer core business.

Three service design tools were used:

- 1) Idea tree – Both service provider and customer views were collected by this tool.
- 2) Business Model Canvas (BMC) - Participating Customer's business model understanding was aided by this tool.
- 3) Service blue print – Provided information about service provider service pathway and point of contact from the initial stages to the final stage of billing including filling and actions of both service provider and customer during the service process.

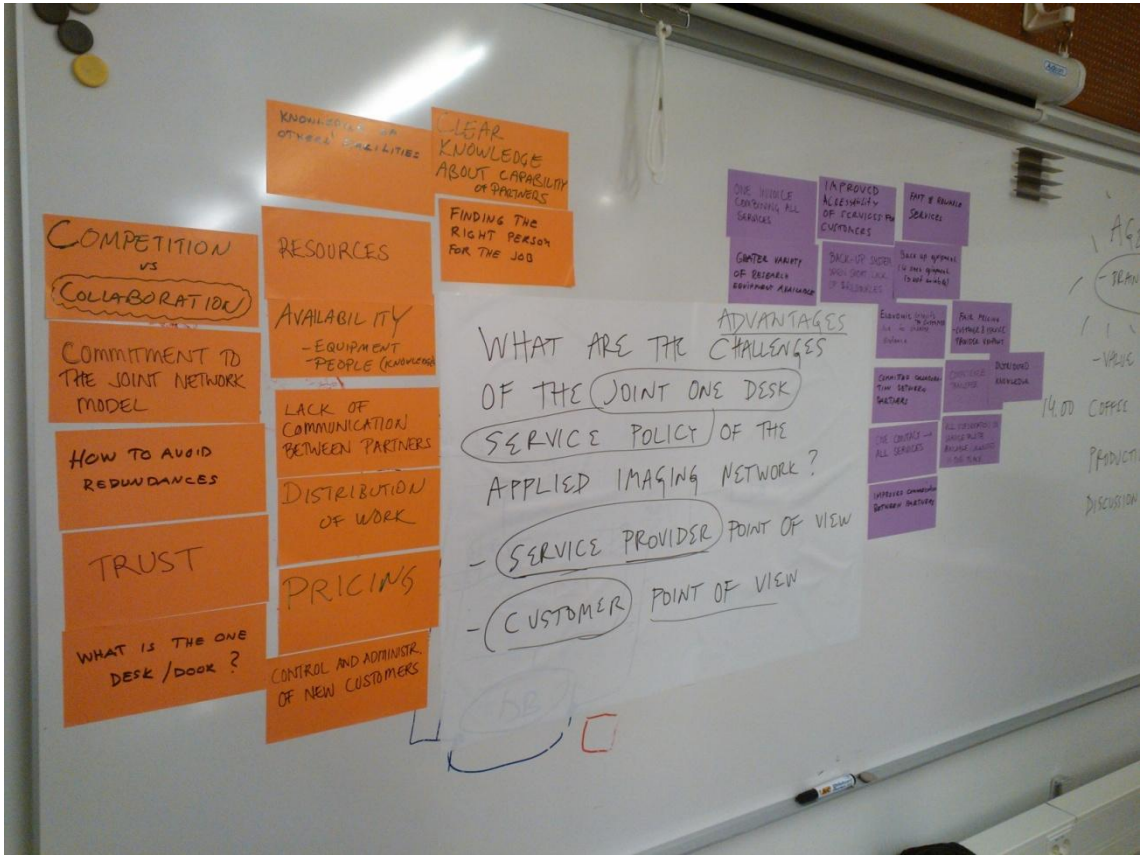
Just like in customer workshop, the expectation of service provider and the customer were linked to see how best to actualize them under joint network.

Workshop 4. Creation Workshop Kemi 15.10.2013

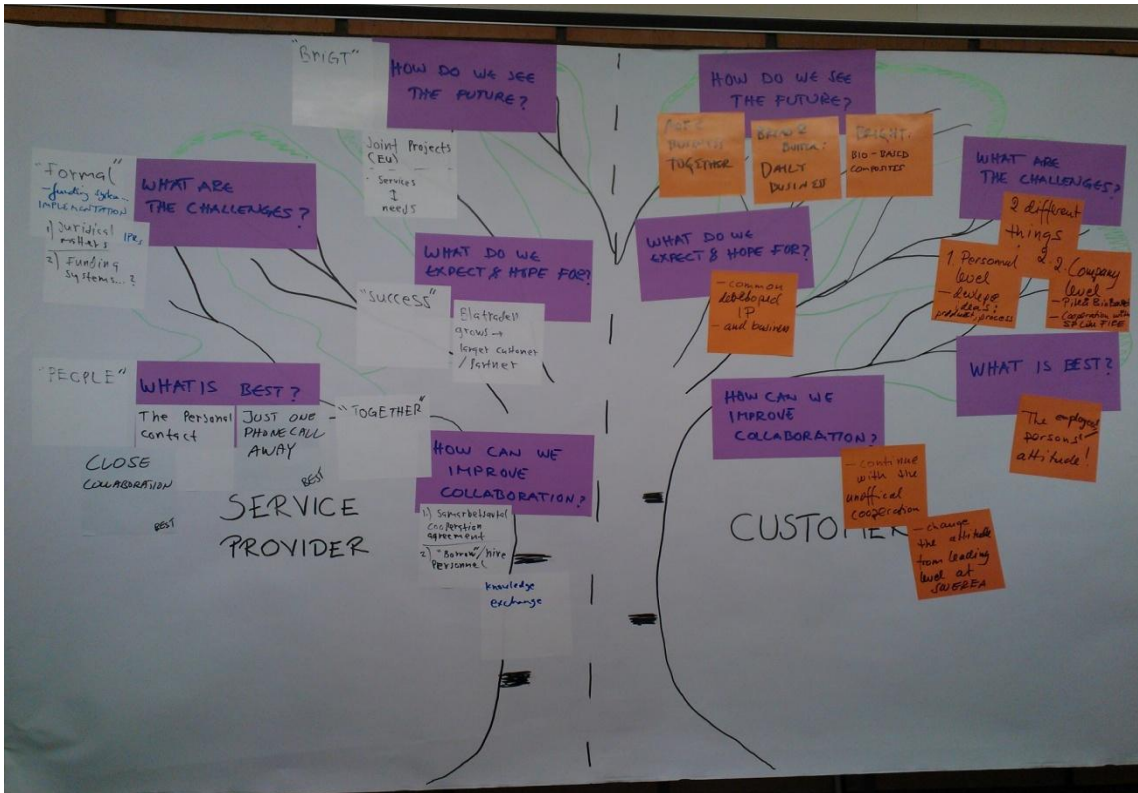
Four service providers were present.

Creation workshop was geared towards actualizing the joint service design.

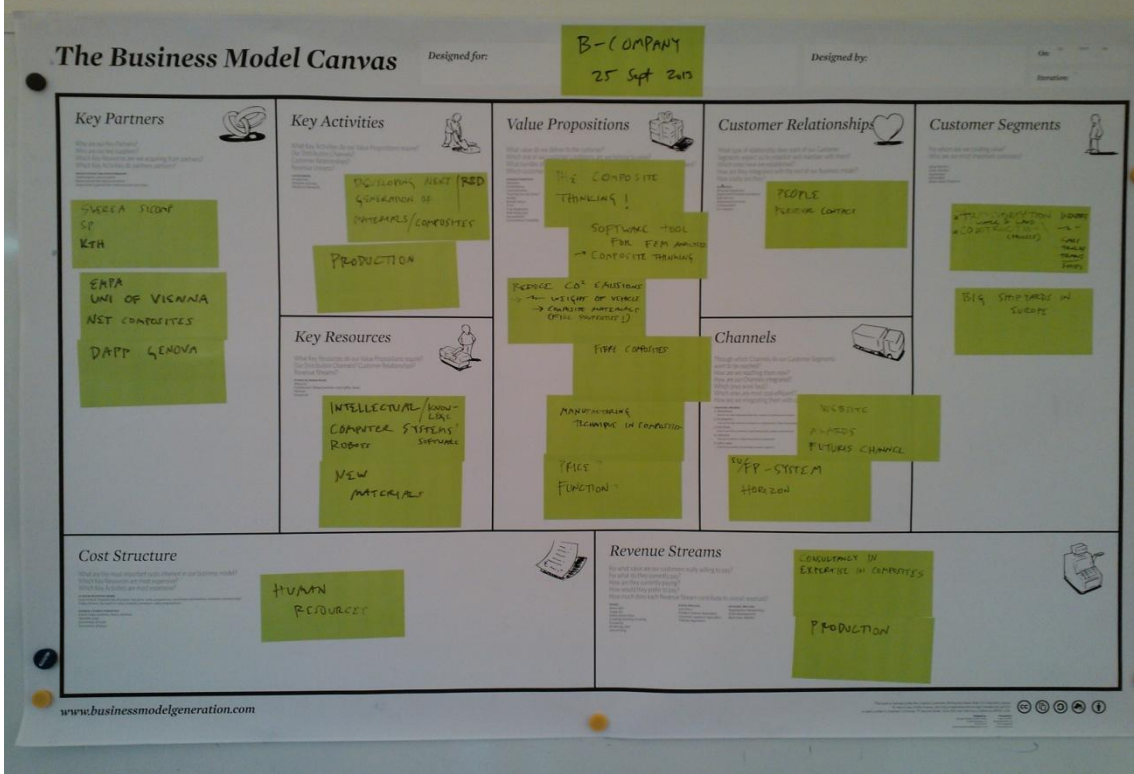
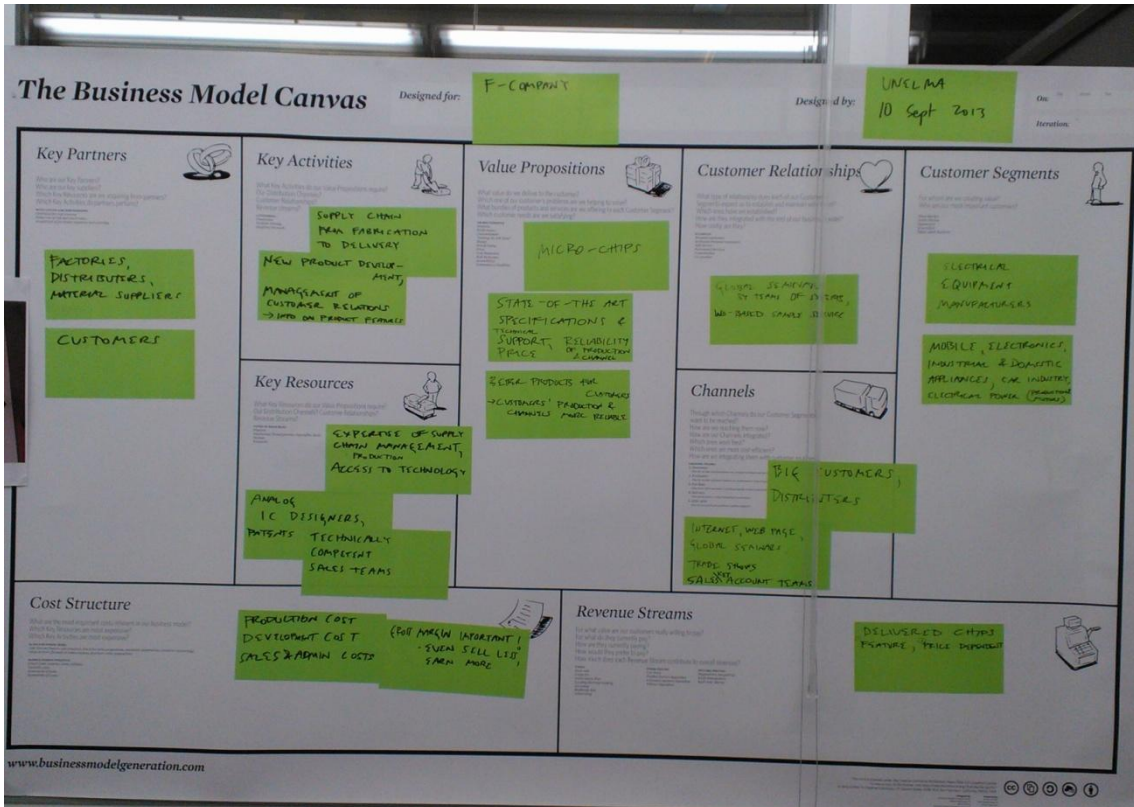
The expected challenges of joint service network were discussed



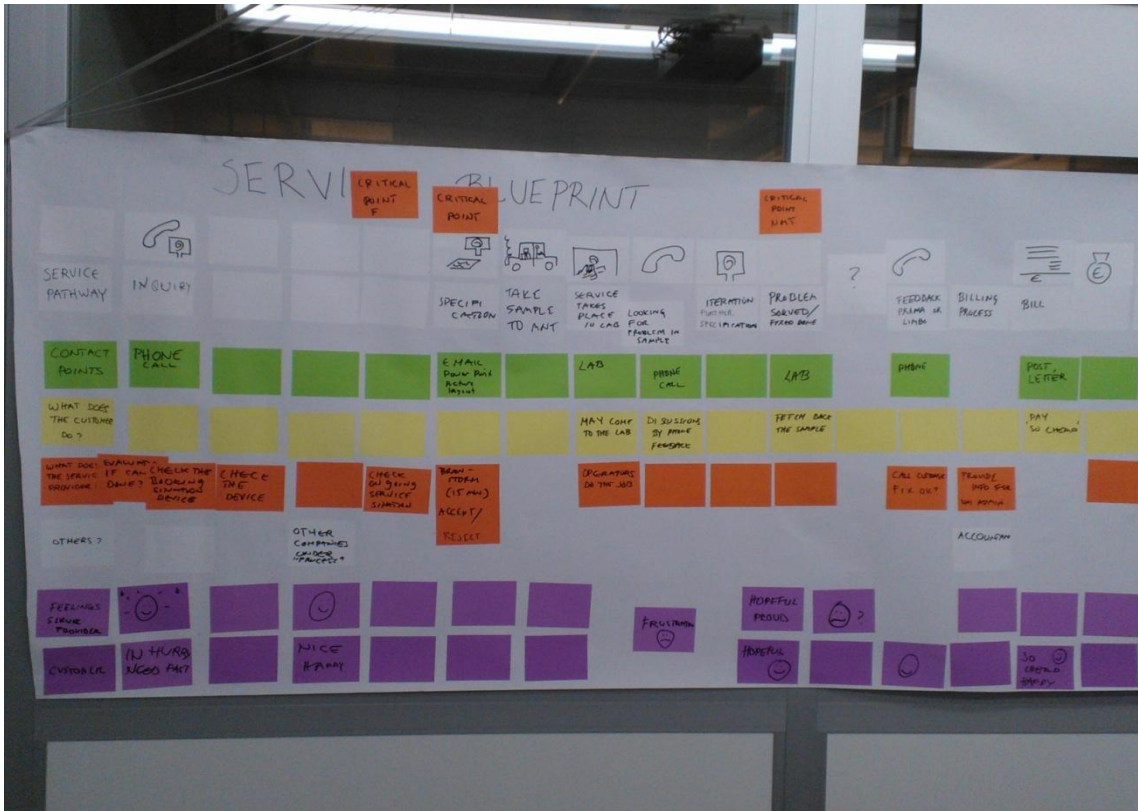
IDEA TREE WORKSHOP 2 & 3



BUSINESS MODEL CANVAS WORKSHOP 2 & 3



SERVICE BLUE PRINT WORKSHOP 2 & 3



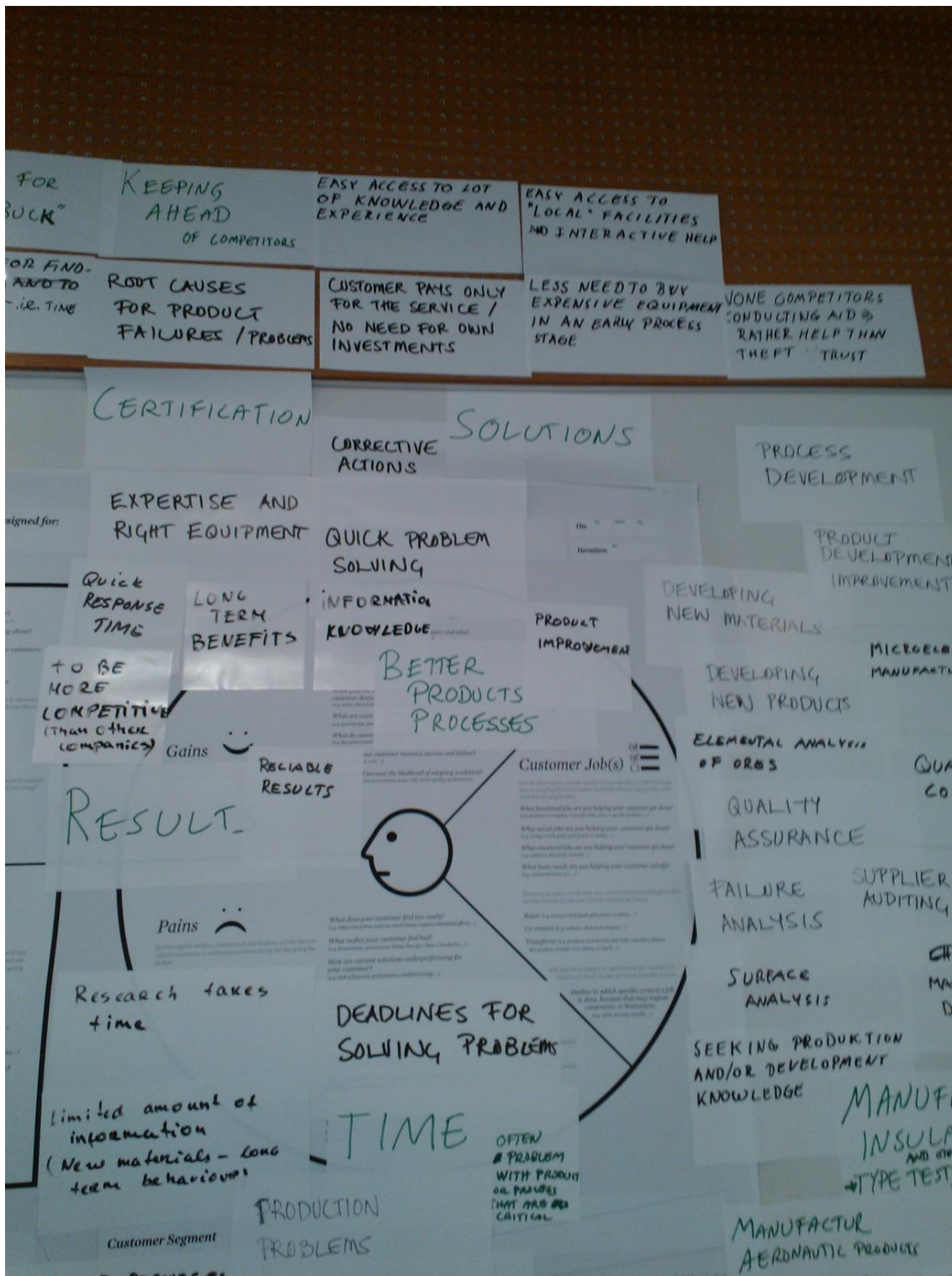
VALUE PROPOSITION CANVAS

The Value Proposition Canvas diagram is centered on the whiteboard. It consists of three main sections:

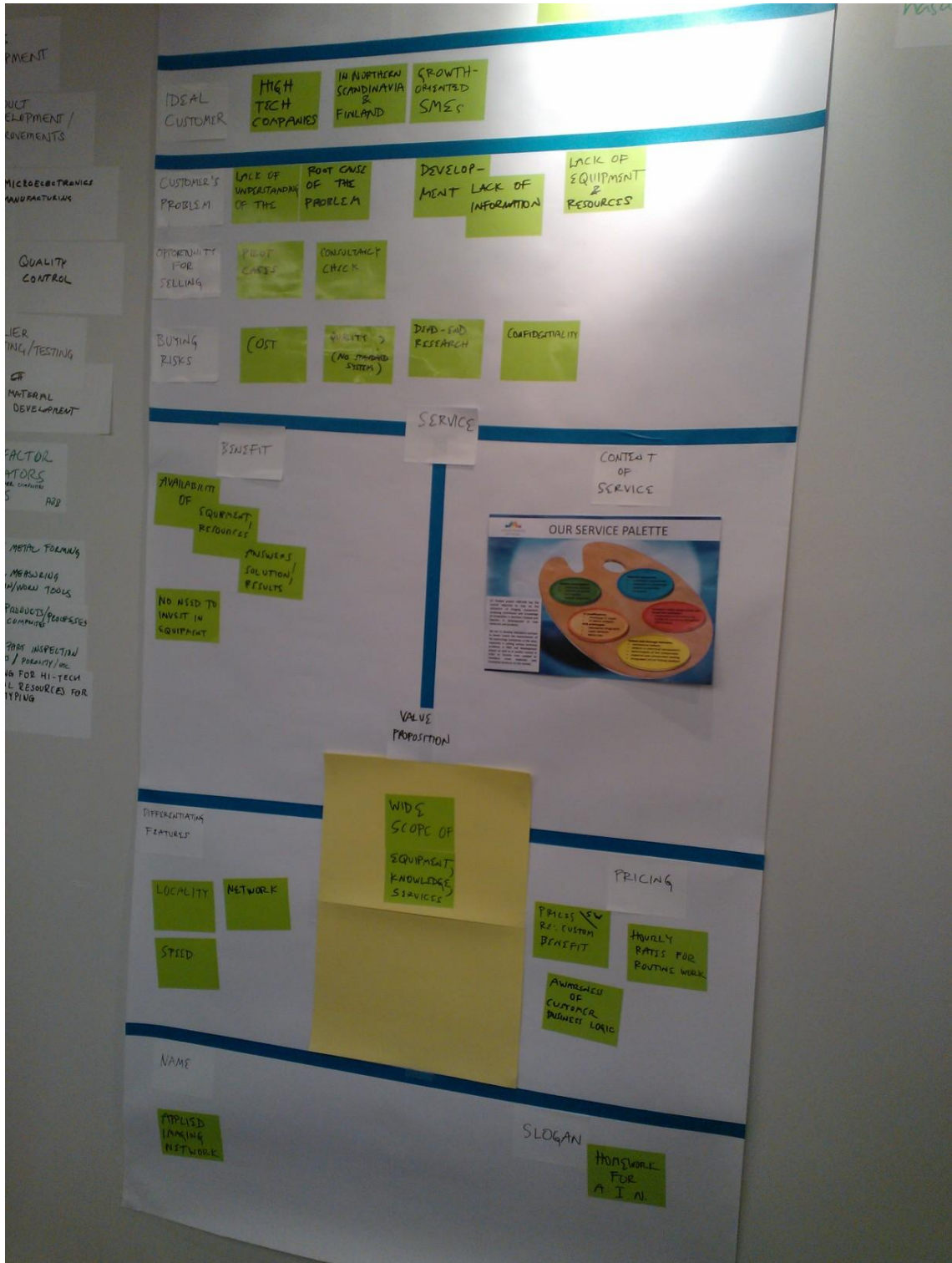
- Products & Services:** A box on the left containing a barcode icon and a list of services including 'Product development', 'Process optimization', 'Quality assurance', 'Failure analysis', and 'Material testing'.
- Pain Relievers:** A box on the right with a list of pain points such as 'Time to market', 'Cost of failure', 'Quality control', and 'Customer satisfaction'.
- Value Proposition:** A central box with the text 'Value Proposition' and 'Create one for each Customer Segment'.

Handwritten notes and sticky notes are scattered around the diagram:

- Top right: 'LESS COST FOR FINDING RESOURCES AND TO IR. TIME' and 'ROUT FOR FA'.
- Center top: 'ONE POINT IN - HENCE YOU ONLY NEED TO KNOW UNELMA' AND THEN ALL PROBLEMS WILL BE SOLVED'.
- Center left: 'The Value Propo Different! BETTER PRODUCT than COMPETITORS'.
- Center: 'ANSWERS', 'RELIABILITY TRUST', 'ACCURATE HELP IS AT RIGHT TIME IS COST EFFICIENT DEVELOPMENT', 'SHORTER TIME TO MARKET', 'TO BE MORE COMPETITIVE (THAN C4H4 COMPANY)', 'RE'.
- Bottom center: 'NO COMMERCIAL INTERESTORS' HENCE IMPARTAL', 'ACCESABILITY', 'QUALITY OF KNOWLEDGE', 'AIN KNOWHOW & FACILITIES'.
- Bottom left: 'www.businessmod'.
- Bottom center: 'FIRST PART INSPECTION QA PROCESS -ANALYSIS -IMPROVEMENT'.
- Bottom right: 'FAILURE ANALYSIS', 'LACK (TIME) FOR', 'onji', 'QU'.



PRODUCTIZATION CANVAS



SERVICE PALETTE

APPLIED IMAGING NETWORK

Our service palette

- Surface investigation**
 - chemical analysis
 - surface structure and quality
 - optical properties
- Material properties**
 - chemical composition
 - mechanical properties
 - optical properties
 - structure
- Computer aided design (CAD) and numerical simulation**
 - Preparation of 2D and/or 3D model for numerical simulation
 - FEM analysis
- Failure and damage tolerance**
 - mechanical defects
 - defects in electrical components
 - deformation of the component
 - material and component testing
 - integrated circuit failure analysis
- IC modifications**
 - Prototype IC repair
 - IC failure analysis
- PCB prototypes**
 - Microprint lithography
 - Laser ablation
 - Micro vias

EU funded project UNELMA has the overall objective to step up the utilization of imaging equipment, analyzing techniques and knowledge of universities in Northern Finland and Sweden in development of new materials and products.

We aim to develop laboratory services to better match the requirements of the technology companies in the area; especially in solving various technical problems in R&D and development phases as well as in quality control in order to shorten time needed to introduce novel materials and innovative products on the market.