

# FINAL REPORT

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Group S205, Project The Voice of the Customer

30<sup>th</sup> June 2016, version 2

**Knowledge**  
Sharing Centre



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**Quarter #:**

7-8

**Academic Year:**

2015-2016

**Date**

30-06-2016

**Version#:**

Version 2

## Executive Summary

The Knowledge Sharing Centre is an independent, non-profit platform, which supports knowledge sharing activities between companies in the Brainport region, which are collaborating in the new product development process. This platform is still in the development phase, but in the future, this platform is expected to be able to accelerate new product development process as well as to improve it to be more effective and efficient in terms of money, time, and quality. Due to the current phase of the Knowledge Sharing Centre, the group collaborated with the management of the platform to perform this qualitative market research. This market research was aimed to help the establishment of the platform by generating idea and insights from potential participants regarding their expectations and demand.

The group was given an assignment on behalf of the Knowledge Sharing Centre. This assignment was to form a recommendation for the set up of the platform, which meet the expectation of the potential participants. This assignment was done in two main phases, which are the external and internal analysis. The external analysis is aimed to gain information and generate ideas regarding some topics of the platform from the potential participants. These topics are concerning the bottlenecks that are recognized by the potential participants within the new product development process, whether or not the Knowledge Sharing Centre can help resolve the problem, and finally concerning the expectations of potential participants for the platform. This external analysis was done by conducting semi-structured interviews to the representatives of the potential participants. On the other hand, the internal analysis is aimed to assess the internal aspects of the Knowledge Sharing Centre organisation. This was done by analysing its business strategy by using a canvass model. Other than that a comparison between the Knowledge Sharing Centre and other similar existing platforms was done by benchmarking. The purpose of this is to assess the uniqueness of the Knowledge Sharing Platform compared to other competitors.

Both analyses mentioned above had resulted in the discovery of strengths, weaknesses, opportunity, and threats for the Knowledge Sharing Centre. These are presented in a SWOT analysis and confronted in a confrontation matrix. The goal of performing these methods is to form a recommendation to the Knowledge Sharing Centre.

By performing SWOT analysis and confrontation matrix, they resulted in some conclusion, which had been transformed into recommendation. Based on that, it is recommended for the Knowledge Sharing Centre to provide more services other than just knowledge-sharing platform, for instance workshops, open doors, shared locations, etc. Most importantly, the Knowledge Sharing Centre should communicate more effectively and clearly their differentiation from its competitors. This entails especially the protection of intellectual property by bilateral contact, protection of company privacy with the presence of knowledge-driven platform – meaning that a company can find answer without all participants seeing its questions. Moreover, it also needs to be communicate why independent and non-profit character of the platform is beneficial for participants.

## Preface

### Company Information

Knowledge Sharing Centre is a non-profit, independent infrastructure initiated by ASML and United Brains, which is currently still in a development process. This infrastructure aims to accelerate the process of new product development by facilitating knowledge-sharing activity between collaborating companies. The initiation of this platform is due to the fact that there are a lot of bottlenecks, especially concerning communication, recognized within the new product development process, which makes the process to be ineffective and inefficient in terms of money, time, and quality. The purpose of this Knowledge Sharing Centre platform is to enable more efficient communication between companies so required information/experience could be shared earlier in the process of developing new product.

Knowledge Sharing Centre will be presented in a form of a knowledge-driven platform that has a back office and front office. The content of it will be knowledge regarding a lot of topics, for example, manufacturing processes including its design constraints, measuring, engineering, etc. The platform will contain of approximately 60% of the participant's knowledge, which is a common shared knowledge. The other 40% is the intellectual property of a company, which is protected. Each participant can look for the knowledge they need in the platform and it will show the highlight of the desired knowledge as well as the contact of companies who owns the knowledge. Using this information, participants can contact the owner of the knowledge and eventually have a bilateral contact, from which the knowledge owner will share its knowledge, possibly the other 40% of the knowledge that is not presented in the platform, to the knowledge seeker. From this bilateral contact, new supply chain is also expected to grow.

There are four types of company that are expected to be the potential participants of the Knowledge Sharing Centre, which can be seen in Figure 1. This is usually called as the 4 pillars of the Knowledge Sharing Centre, which are:

- Original Equipment Manufacturer
- Engineering Company
- Manufacturing Company
- Teaching Institutes

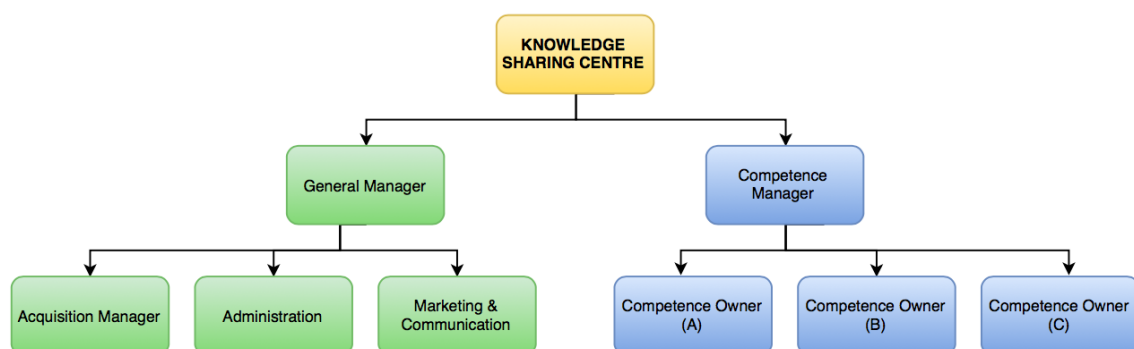


Figure 1: 4 Pillars of Knowledge Sharing Centre

These 4 pillars, mentioned above are expected to be the participants of the Knowledge Sharing Centre due to its high participation in new product development process. In the start of its operation, the participants is only aimed for companies within the Brainport region, however, in the long term, all companies in the Netherland are welcome to join.

To be a participant of the Knowledge Sharing Centre, each company have to pay for contribution fee, even though the Knowledge Sharing Centre is a non-profit platform. The contribution fee will be used only for covering the operational expenses of the platform, which is expected to be €600,000 per year.

The Knowledge Sharing Centre organization would be divided into two managements. Which are the general management and competence management, which can be seen in Figure 2.



*Figure 2: Knowledge Sharing Centre Organisational Chart*

The general management will contain of approximately 5 FTEs, who will be responsible for the administrative and management work for the Knowledge Sharing Centre. On the other hand, the competence management will be responsible for the reliability and quality of the knowledge provided by the platform. The competence management will contain of approximately 15 to 20 part-time employees/experts, who has specialties in one area. Therefore, each specific area of knowledge would have a competence owner. These competence owners will review several times the knowledge provided by participants, send back several times to the participants to be adjusted, until at the end it will be approved to be published in the platform. The way that these competence owners will be attained still needs to be defined, however, the current idea is to have two types of experts, which are the scientific experts who are people from the Technical University of Eindhoven (TU/e) as well as experienced experts who are people from participating companies.

### Relevance for Readers

Within this document, you will find the result of S205's research concerning the potential participants' demand and set-up recommendation for the Knowledge Sharing Centre, which is followed by the process and method used to reach the conclusions. All content in this report is relevant for the assessors from all the contributing parties, which are the Knowledge Sharing Centre, United Brains, ASML, and Fontys University of Applied Sciences, Eindhoven. However, the description of Knowledge Sharing Centre might not be relevant for the assessors from United Brains and ASML, who are Mr. Frank van der Chijs, Mr. Arno Sprengers, and Ms. Anne Gommers.

### Word of Thanks

The opportunity to contribute to the development of Knowledge Sharing Centre by doing a market research project was a very delightful experience. We would like to thank the management of Knowledge Sharing Centre for giving us this opportunity. Moreover, we are also grateful for the help that were given by the employees of ASML for giving us the permission to test our interviews with. Most importantly, we also thank all the companies that are willing to collaborate in this research by giving us meaningful input through interviews. And not to forget, we thank all the teachers for the endless assistance and support that were given throughout this project.

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## Glossary

KSC	: Knowledge Sharing Centre
Pillars	: Type of company, which is expected to be Knowledge Sharing Centre's participants
SPSS	: Software package for statistical analysis

## Chapter 1: Introduction

This chapter gives general information to the reader concerning the research assignment, background, as well as the goal of the research. Furthermore, the method and tools used to conduct this research is also explained further in the chapter.

### 1.1 Project Description

Knowledge Sharing Centre is a knowledge-sharing platform, initiated by the United Brains and ASML. The background behind the initiation of the Knowledge Sharing Center platform is the problem that occurs during the new product development phases. In developing new product, there are several phases that need to be done. These phases are in accordance to the V-model, which is illustrated in Figure 3. V-model is a model that is typically used by the companies within the Brainport region in developing new products.

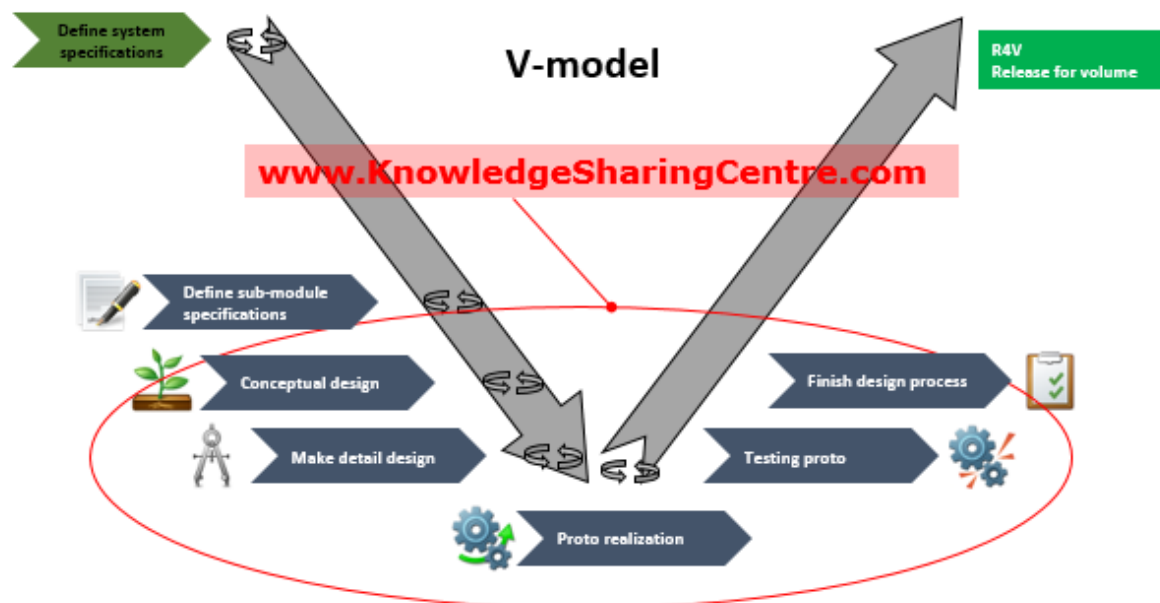


Figure 3: V-Model

Different companies need to collaborate in developing new product. Usually, different steps within the V-model are done by different companies. Some companies might do one phase, but some might do two or more. This collaborative activity is where the problem occurs and Knowledge Sharing Centre believes that this can be done more effectively and efficiently in terms of money and time. Currently, those collaborating companies do not share knowledge with each other leading to bottlenecks within the new product development phases (V-model), which make the whole development process to be ineffective in terms of time and money. One example that usually happens is when a manufacturing company cannot produce the product that is designed by other companies because it does not have the production means or technology to produce the specific product. This is because those companies do not share their knowledge with each other.

Based on that problem, the idea of having a platform, in which the participating companies can share knowledge with each other, came up. Using this platform, it is believed that it can help the new product development process to be more effective and faster. By providing the right support/information to the collaborating companies in the Brainport region, the bottleneck within the new product development process could be resolved.

Therefore, to help the development of the Knowledge Sharing Centre, this project was done for the purpose of getting insights of the potential participants' expectations/demands, and eventually gives indication on how to set up a platform that fits to the participants' expectation.

## 1.2 Research Question

To what extent can the Knowledge Sharing Centre provide support, and help solving problems related to the new product development by knowledge sharing in the Brainport region?

### 1.2.1 Sub-questions

- Is there any communication disruption that is recognized by the companies involved in the new product development process?
- Would the initiation of the Knowledge Sharing Centre be useful to resolve the bottleneck within the new product development process?
- How should the Knowledge Sharing Centre be set up to enable and support an efficient and effective communication within the new product development process?

## 1.3 Project Assignment

After discussing the current and clarifying the expectations of Knowledge Sharing Centre, the assignment was established as follows:

- To have in depth understanding of the research topic
- Find out by interview the bottleneck and the expectation of the clients
- Recommendation on how the KSC should be set up

## 1.4 Research Objectives

The research objectives are the goals that are expected to be achieved for this research. The objectives are divided into two categories, which are business and assignment goal.

### 1.4.1 Business Goal

The goal of the Knowledge Sharing Centre is to make the new product development process in the Brainport Region more effective and efficient.

### 1.4.2 Assignment Goal

The goal of this assignment is to help the Knowledge Sharing Centre to come up with the set up recommendation of the platform to enable companies to find each other and share knowledge in the most effective way. Furthermore, with the set up recommendation, it is believed that it will help overcoming the bottleneck related to the new product development process.

## 1.5 Method of Investigation

The type of research used for this assignment is a qualitative research, which is an exploratory research that aims at getting insights and understanding of the demand and expectation of the potential participants of the Knowledge Sharing Centre. The analysis of this research was done in two ways, which are external and internal analysis. Eventually, the results were compared using confrontation matrix in order to formulate recommendations to fill in the gap found in the confrontation matrix. The methods and tools used in different stages of this research will be explained further in the following section.

### 1.5.1 External Analysis

In order to obtain the opinion of the potential participants, an external analysis was done to analyse the aspects outside of the Knowledge Sharing Centre. The external analysis was done by doing a semi-structured interview, from which the result was recorded, transcribed, and analysed using grounded theory.

### **Semi-structured Interview**

The interview was done mainly to obtain the opinion of the potential participants to answer the research questions mentioned in previous section. Therefore, a set of questions regarding those matters was created to be asked during the interview. The type of interview is a semi-structured interview, which means that the interview is more open and it allows new ideas or insight to be brought up during the interview.

### **Interactive Service Delivery (ISD) Model**

Interactive Service Delivery is a research model to analyse the quality of service provided by a company. This model assesses 5 aspects of a service, which are quality and certainty, accessibility, trust, personal attention, responsiveness, and tangibility. Since the Knowledge Sharing Centre provides only service, this model was used to determine the aspects to asked during the interview.

### **Transcript**

For the purpose of analysing the interview results in a structured way, all interview recordings were transcribed. This means that those recordings were transformed into a written form.

### **Coding**

Coding was done on the transcript of the interview recordings. The purpose of this coding is to mark important answers from the interviews that answer the research questions. These codes are then grouped to categorize the interview answers. These codes helped to summarize the answers using the software called “QDA Miner” and helped generating recommendation ideas for the Knowledge Sharing Centre.

#### **1.5.2 Internal Analysis**

The internal analysis was done to evaluate the strength and weaknesses of the Knowledge Sharing Central from the internal organisation point of view. Several internal aspects of the Knowledge Sharing Centre were evaluated by using a canvass model. Other than that, a comparison between the Knowledge Sharing Centre and other similar platforms in the Netherlands has also been done by doing benchmarking.

### **Canvass Model**

Canvass model is a tool used to describe the internal aspects of the Knowledge Sharing Centre. Those aspects are the key partners, key activities, key resources, value proposition, customer relationships, channels, customer segments, cost structure, and revenue streams. This model was used to map out the current strategy idea of the Knowledge Sharing Centre and then to compare with what actually want to be achieved by the Knowledge Sharing Centre. By doing that, several gaps could be found and improved.

### **Benchmarking**

Benchmarking was done for this analysis for the purpose of knowing how the Knowledge Sharing Centre differs from other similar platforms. The result of this could help to give a recommendation to the Knowledge Sharing Centre regarding how to position itself amongst similar platform, so that it remains “unique”.

#### **1.5.3 Drawing Conclusions**

After the internal and external analyses were conducted, the result from it was analysed by SWOT analysis and confrontation matrix.

## **SWOT Analysis**

SWOT Analysis was used as a tool to draw the conclusion because it identifies the strength, weaknesses, opportunities, and threat of the Knowledge Sharing Centre. The information of the strength and weaknesses was retrieved from performing the internal analysis whereas the information of opportunities and threats was obtained from the external analysis.

## **Confrontation Matrix**

After the SWOT Analysis had been performed, a confrontation matrix was then used to further analyse the output of the SWOT Analysis. Using the confrontation matrix, the combination of strength, weakness, opportunity, and threat was analysed. The goal of this matrix is to indicate which strategy that the Knowledge Sharing Centre should use, and which strategy it should stop or should not use.

## **1.6 Structure of Report**

This document is divided into 3 main parts, namely:

- Chapter 1: Introduction
- Chapter 2: Analysis of research
- Chapter 3: Recommendation and conclusion

### **Chapter 1**

The introduction chapter is aiming to justify the importance of the research assignment. This was done by stating the project background and the means to achieve the final solutions. This chapter also specifies the assignment by presenting the research questions to be answered by this research, as well as the objective of this research. Moreover, some tools that were used during the analysis of this research are also explained.

### **Chapter 2**

This part of the document focuses on answering the research question, in which the result of the analyses done during this research, which are the internal and external analysis, is explained. Other than that, the process of reaching the result is also presented using the tools that was mentioned in the previous section. Results from both analyses were confronted to find some gaps that should be filled in order to fulfil the customer's expectation. The result from this will be the guide to formulate the final solutions for the Knowledge Sharing Centre.

### **Chapter 3**

The gaps that were found from the analysis, mentioned in chapter 2, are transformed into elaborate recommendation in this chapter. The recommendation is also followed by the goals and actions that should be taken to achieve the goal.

## Chapter 2: Analysis of Research

This chapter focuses on the analysis that was done for the research. This chapter is divided into 3 main parts, namely, the external analysis, internal analysis, and confrontation analysis. In each part, it is explained in detail the methods and tools used to do the analysis, as well as the results of the analysis.

### 2.1 External Analysis

The external analysis was done for the purpose of answering the research question by obtaining information about the external aspects of the Knowledge Sharing Platform, which is the expectation of the potential participants. Conducting semi-structured interviews with several companies, from which the results were analysed, did this analysis.

#### 2.1.1 Semi-structured Interview

To gain inputs and insights from the potential participants of the Knowledge Sharing Centre, interviews were done. The type of these interviews is a semi-structured interview. A set of questions (Annex 1) and an introductory text (Annex 2) for the interview were created in order to guide the interviewers, as well as to reduce the variation of the questions and answers given by the interviewees. However, the interviewees were not restricted with answer options, instead, they are open for any opinion they might have regarding the discussed matter. With regards to the research question, the interview was aimed at obtaining the information regarding several aspects concerning the set-up of the Knowledge Sharing Centre. Those aspects are:

- Recognition of bottlenecks.
- Feasibility of the Knowledge Sharing Centre.
- Information content and form.
- Service content and form.

These aspects were broken down in more detail into dimensions and furthermore into properties which should be answered by the interviews. The dimensions were as follows.

- Identity
- Context information
- Bottleneck recognition
- Usefulness
- Type of information
- Quality and certainty
- Tangibility
- Accessibility
- Trust
- Personal Attention
- Responsiveness

These dimensions were chosen based on Interactive Service Deliver (ISD) Model (Figure 4). This model was chosen due to its suitability for service provider, which is what the Knowledge Sharing Centre is. Moreover, some dimensions were added for the purposes of the research matter. These dimensions and properties are presented in a variable chart (Annex 1), which were transformed into interview questions. The interview questions were made different between companies and teaching institutes due to the difference in processes and role within the new product development process, therefore also different difficulties/bottlenecks and different information needed.



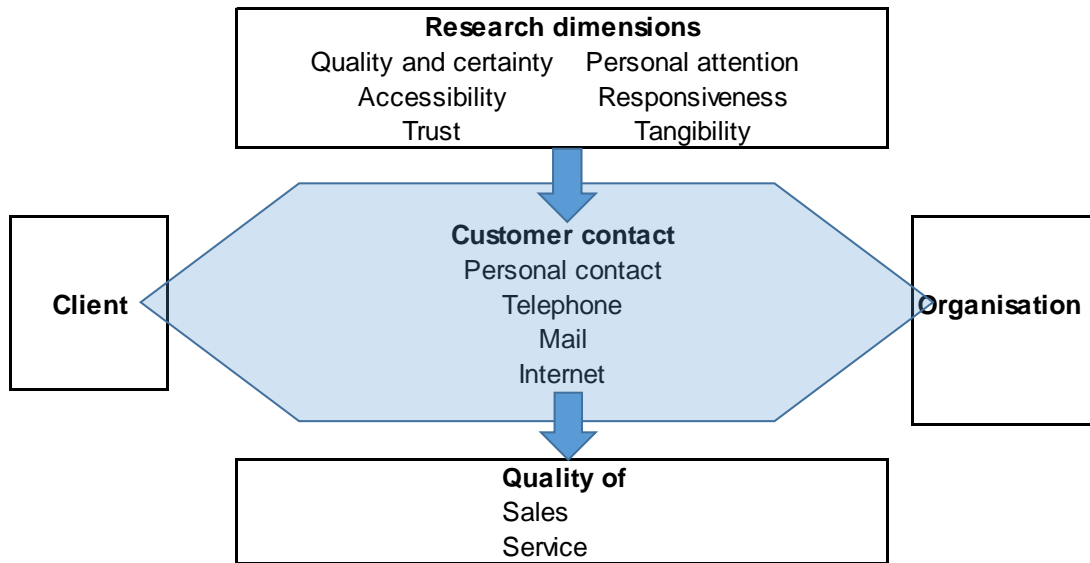


Figure 4: ISD Model

### Target Group

As it was mentioned previously, the main target group for the Knowledge Sharing Centre's potential customers are focused on the companies within the Brainport Region, and eventually will expand to the whole Netherlands. Therefore, the target group of this interview was the person from companies within the Brainport Region and other part of the Netherlands, that participate in new product development process. Since this population is too big, the population chosen for this research was narrowed down to the companies that were already familiar with the idea of the Knowledge Sharing Centre, through their presence in the Precisiebeurs 2015 and a workshop held by the Knowledge Sharing Centre, from which the idea of the Knowledge Sharing Centre was shared. The total population for this interview was 89 companies, and a sample of 14 companies were interviewed due to their willingness to collaborate in this research (Figure 5 and Figure 6).

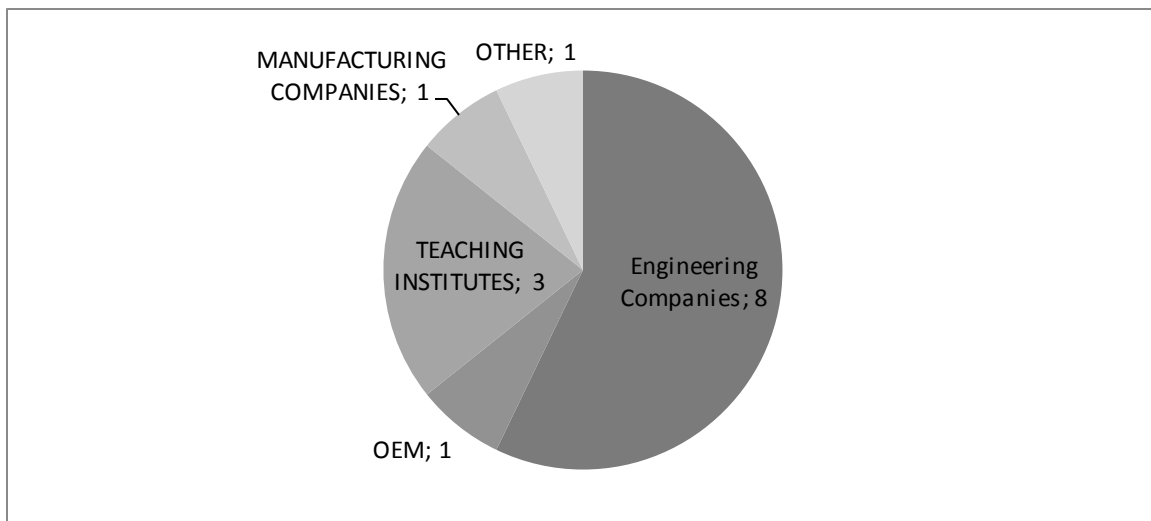
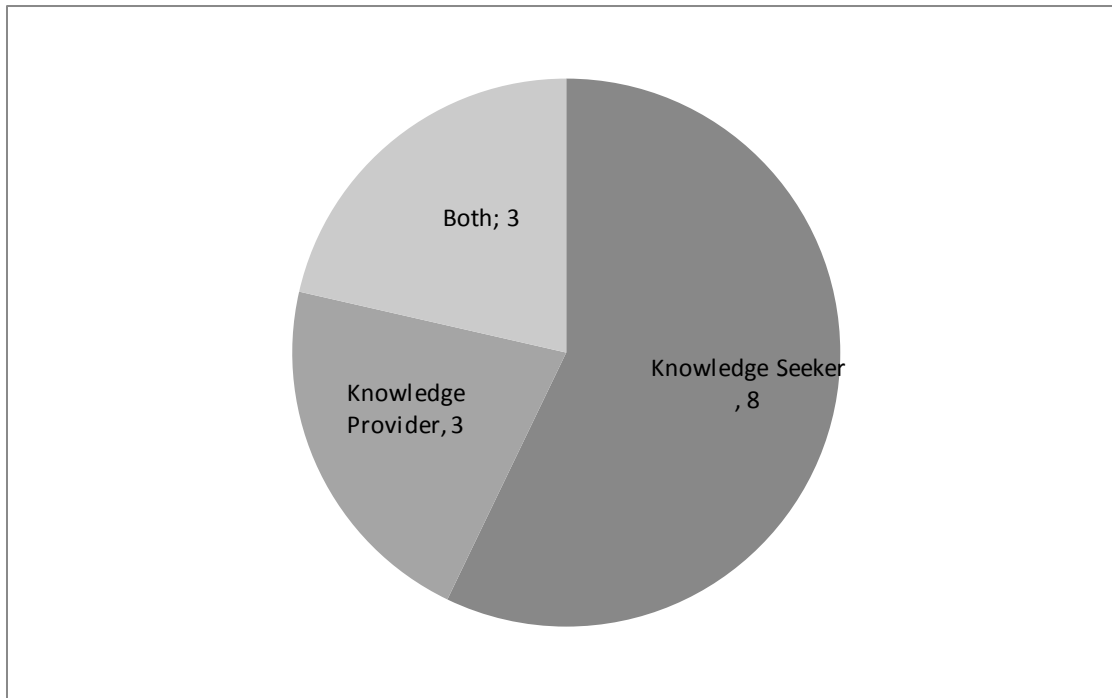


Figure 5: Interviewees Composition



*Figure 6: Interviewee Composition (seeker/provider)*

### **Interview Approach**

The interviews were done in two steps, which are the test interview and the actual interview. Two test interviews were done within ASML to make a trial for the interview questions, to see whether the questions have covered all the important aspects or not. From these test interviews, some input were obtained and the questions were adjusted accordingly.

Following the test interviews, the actual interviews were conducted. Several actions were done prior to the interview, which are the following.

- Approaching potential participants by email for interview request
- Calling potential participants to arrange interview appointment
- Interview preparation, such as, checking interviewee's LinkedIn profile and company research

### 2.1.2 Data Processing and Analysis Approach

The interview results were processed and analysed by an approach. The results were transcribed, coded, and analysed using the software called “QDA Miner”. The approach and tools are explained in details in this section.

#### **Transcript**

For the purpose of analysing the interview results in a structured way, all interview recordings were transcribed. This means that those recordings were transformed into a written form. The transcripts were done by one of the persons that participated in the interview. The transcribers deliberately left out parts of the interview, when the interviewee talks about topics that are not relevant to the questions asked. However, if the interviewee answers one of the questions under a different question, the transcriber has not left out this part, so the input can be still recognized and noticed.

#### **Coding**

As mentioned in the Method of investigation, the approach was to get insights and understanding of demand, therefore the group was looking for ideas and expectations of the interviewees. For this reason was the Open coding done in a way of coding these notions from the transcripts, and put aside prejudices, presuppositions and previous knowledge of the subject area and concentrate instead on finding new ideas in the data. The coding was done by three group members to ensure the consistency of the coding. The process of coding consisted of several steps, which are as follows:

*Determining relevance* - Before the coding process began, the group had to agree on the relevance of the coding, as the transcripts represent rich data and can be difficult to process. The coder needs to be rather selective, so only relevant data are processed for further analysis. Therefore, the group decided that the relevant data are the ones answering the research question and sub-questions.

*Open coding* – As an initial coding, the group coded few transcripts and then reviewed together, whether the coding is correct and consistent with the other members. After this initial coding, the rest of the coding was done, and then review once more for the consistency, as well as fixing inappropriate codes to more suitable and correct ones.

*Merging synonyms* – After this, merging of codes with similar meanings or spelling deviations was conducted. This is the first reduction of data.

*Axial coding* – During Axial coding, codes were merged based the relation to the same matter or issue, for instance codes 1) comment board, and 2) comment as feedback, could be connected as they represent the same answer. This was the second reduction of data, it was a necessary step as there were great number of codes detected during the coding.

*Selective coding* – The last coding step was to group codes based on the concepts found in the research, which in this case was to describe how the intended service platform should be set-up, aside from finding background information of the research, for example bottlenecks.

#### **Use of software**

The first intention was to use a statistical and analytical software called SPSS (Statistical Package for the Social Sciences), however this software is suitable for a quantitative research to conduct various statistical analysis. The research conducted by S205 is of a qualitative character, therefore using SPSS would not be suitable for analysing of the collected data (in form of interviews) and also would not bring the desired results (generation of ideas). Therefore, the group S205 has decided to use a more suitable software.

After a discussion with the management of the KSC, the decision was made for choice of **QDA Miner**, a qualitative data analysis software. This software performs appropriate data processing and analysis suitable for qualitative research, to get the most out of rich data such as interviews.

### **2.1.3 Interview Results**

The interviews that were done have resulted in some inputs and ideas on how to set up the Knowledge Sharing Centre's platform on different aspects. These aspects are the bottlenecks recognition, feasibility of the platform, information content and form, service content and form, and rating system. As this research is a qualitative research, the purpose of this research is to generate ideas. Therefore representative conclusion could not be obtained due to the small sample size, which did not enable us to perform a statistical analysis on the results. The ideas are listed in the following sections.

The results of the interviews were handled confidentially amongst the contributing parties, which are Fontys, United Brains, ASML, and the research group S205. This ensures the privacy of the interviewed companies.

#### **2.1.3.1 Recognition of Bottlenecks**

The Knowledge Sharing Centre is aimed to help resolve the bottleneck faced by companies during the new product development process, therefore with this research, more in-depth information concerning the bottlenecks were explored. Based on the interviews, a lot of bottlenecks were mentioned by the interviewees. Those are listed in (Table 1). Most of the bottlenecks found are related to the insufficient knowledge that a company have.

Table 1: Bottleneck Recognition

Bottleneck	Explanation
Communication	Misscommunication due to lack of cooperation during the product development processes, mostly between engineering and manufacturing companies
Costing	Difficult to make an accurate cost estimation for the product
Customer misjudgement	Different understanding of problem between customer and company, or even the customer does not know the actual problem that they face
Expert capacity	Lack of in-house experts that are available at certain time
Finding expertise	Difficult to find experts, especially for very specific and specialized topics
Customer demand	Customer wants something more than what the company can normally do, therefore higher quality work should be done
Lack of knowledge/expertise/experience	Companies do not have enough knowledge/do not know how to do certain things to continue the product development process
Lack of time	Problems have to be solved as soon as possible to be able to market the product on time
Lack involvement	Lack/too-late involvement of customers and required expertise during the new product development process, resulting problems to be found too late
Limitation of production technology	Customer expectation could not be fulfilled due to not having sufficient production technology
Make or buy decision	Difficult to decide whether to outsource or make products
Market failure	Incorrect interpretation of customer demand leading to failure after product is introduced to the market
Non-technical knowledge	Lack of non-technical knowledge for engineers, e.g. financial and management
Not knowing what information needed and where to find it.	Some companies do not know what information should be taken into account while developing products and where to find the information, especially for small companies/start-ups
Price	Companies only want to share knowledge with high price involved
Regulation	A lot of rules should be followed during product development
Short-term need for expert	Some companies only need experts for a certain period of time, but they are hard to find
Difficulties in finding suitable partners	Sometimes, it is difficult to choose the suitable partner that can do the task a company needs
Trustworthy information	Difficult to determine if the information found on internet is trustworthy, therefore a meeting with specialists is always needed

#### *2.1.3.2 Usability of Knowledge Sharing Centre*

The interview has resulted in mixed opinion regarding the usability of the platform. Large portion of the interviewees said that the idea of the platform is good. They found it beneficial and useful to the new product development processes because it connects engineers, businesses, and value chain. Moreover, it is also good for the entrance of new businesses since the platform enables people to search for knowledge that they do not have yet, which is very helpful for a new starting entrepreneur who usually have only little experience.

However, as much as they found it beneficial, a lot of the interviewees also found the platform to be overlapping with other existing platforms, such as the Mikrocentrum and Brainport Development. The interviewees did not see the uniqueness of the Knowledge Sharing Centre as well as not so much added value for them to join another additional platform because most of them are already part of Mikrocentrum or Brainport Development, which incurred more effort, time and money for them.

#### *2.1.3.3 Information Content and Form*

##### **Information Content**

In order to support the new product development process, there is some information that is usually required by the interviewed companies. These information ideas mentioned by the interviewees are the information that is expected to be shared in the platform. The information content ideas are presented in Table 2. Other than that, the content in the platform should be both specialized and basic knowledge. Specialized knowledge is for larger companies, which already exist for a long time and therefore has a lot of specialties and experience. On the other hand, the basic knowledge should also be shared because it would be useful for smaller, just starting-up companies. Since start-up companies usually have little experience, having a platform, from which they can find knowledge, would be very helpful so they could prevent problems that they did not even know could happen.

Table 2: Information Content

<b>Idea</b>	<b>Explanation</b>
General information	Information regarding the platform, such as participation guidelines and contribution fees
Design	Design constraints
Manufacturing	Available manufacturing means/technologies and innovations
Production techniques	Information about production techniques in general were expected
Material properties and techniques	Information about materials properties and techniques in general were expected
Measurement	Knowledge regarding measurement methods and what can be measured
Risks	Knowledge regarding risks of a certain technology or activities, e.g. risk of jamming
Usage of parts	Explanation of function of a certain part
Testing	Information of testing method that can be performed during product development
New product development knowledge	Information or knowledge regarding phases of new product development process, and information that is frequently needed within each phase
Usage of product	Explanation of function of a certain product
Company description	A short introduction of what each participant, what are their specialties/machines
Human resource information	Knowledge regarding human resource, e.g. how to hire employees, what is the best way to expand business

## Information Form

The information content stated above can be presented in different forms. There are some forms ideas mentioned by the interviewees, which are stated in Table 3.

Table 3: Information Forms

Idea	Explanation
Brochure	The Knowledge Sharing Centre can also provide a brochure regarding the platform in form of brochure, where there are a lot of information in it
Categorization	The knowledge in the platform should be categorized based on company background and its expertise
Cross-dimensional links	Hyperlinks within the knowledge description to other related topic/knowledge
Specification of products	Can be presented in form of product datasheets or technical documentation
Example from practices	Example of what has been done and what works/does not work
Explanation	Text explanation of the knowledge in detail, can be in form of articles
Visual content	Images and videos can also be placed in order to support the explanation
Filters	The knowledge should be able to be filtered based on some specific categories
Keywords & terms	Keywords and terms can be used for searching, but also can be presented within the explanation to quickly know the content of knowledge
Language of search	It should be decided whether the search can be done both in English and Dutch, or just English/Dutch
Personal reach	Face-to-face contact to have discussion
Templates	Templates of intellectual properties

### 2.1.3.4 Service Content and Form

#### Service Content

Not only that the Knowledge Sharing Centre platform should provide knowledge, it also should provide services to support the knowledge-sharing centre activities. According to the interview results, there are some service contents that are expected by the interviewees (potential participants, which are listed in Table 4.



Table 4: Service Content

Idea	Explanation
Helpdesk	Giving assistance to customers regarding the platform, e.g. customer service
Company visit	Inviting students to participating companies
Student participation	Collaboration between students and participating companies to work on projects
Bilateral contact support	Support during bilateral contact, such as legal support, IP support, and contract review
Events	Conducting events to gather all participants together and to meet each other
Expert groups/competence owners	To review the quality of knowledge shared in the platform as well as to answer questions asked by participants
Freelancers	It would be good to have a pool of freelancers to give the possibility for participants to hire for projects
Guest lectures	Collaboration between teaching institutes and participating companies to invite a guest lecturers to teach certain topics
Internship	Collaboration between teaching institutes and participating companies to have an intern working in the company
Introduction day	An event where participants can introduce themselves in the start of the platform (kick-off session)
Investors	A pool of investors that participants can present their product to and request for investment
Knowledge sessions	Holding courses or lessons of certain topics
Meeting	Having a meeting between Knowledge Sharing Centre and participating companies to have discussions regarding the development of platform, asking for feedback based on participants' experiences
Open doors	Conducting an open door activities where a company is free to be visited by other participants to see what it does, what it has, etc.
Overview plans	Make visible for the participating companies about the development plan of Knowledge Sharing Centre, e.g. what it has now, what to do in the future, and when
Response obligation	All participants are obligated to respond to knowledge request at a certain amount of time
Shared location	Having a place where participants can come, just like seats2meet
Troubleshooting	A support when there are troubles in the platform, e.g. platform does not work

## Service Form

The service content presented above can be presented in different forms. Based on the interview results, the forms listed in Table 5 are the forms that are preferred by the interviewees.

Table 5: Service Form

Idea	Explanation
Comment bar	To quickly post short comment, questions, or feedback
Face-to-face contact	It is preferable for some interviewees to have a direct meeting instead of call or email
Chat box	A live chat possibility with a customer service of the platform
Email	Email contact is accepted
Call	Phone call

### 2.1.3.5 Rating System

To ensure the quality and reliability of the shared information in the platform, the Knowledge Sharing Centre has an idea of implementing a rating system for this matter. During the interview, it was investigated whether the rating system would be accurate and valid to ensure the quality and reliability of the knowledge. Moreover, the criteria of the rating were also investigated. There are some ideas and opinions regarding the rating system from the interviewees, which are listed in Table 6.

Table 6: Rating System

Idea	Explanation
Accuracy doubt	There are doubts whether rating can be accurate and not subjective
Trustworthy issue	There are concerns of the rating being not trustworthy and independent.
Quality based	Rating should be based on the delivered quality of product, information, service, etc.
Clear rating	It has to be clear what each rating point means and how it will affect the relationship between the companies
Common denominator	The rating should be based on a criteria which all participants have in common, based on which all participants can be assessed
Transparency	Each given rating has to be fair and based on some reasons
Honesty	The rating should be based on how well the company keep its promises, e.g. in delivery time, participation, quality
Personal touch	The Knowledge Sharing Centre should be involved in the rating system with giving personal touch, meaning that it should control and have overview of why a company is rated as bad/good and try to resolve the problem
Proven in practice	The rating should be based on the actual experience/work that has been delivered
Quality of relationship	The rating should also be based on the relationship between the 2 companies, e.g. communication, friendliness, collaboration
Responsiveness	How fast the company respond to the knowledge request
Review	Not only just rating, but also give opportunity for companies to write reviews, comment, or feedback
Simple question	The rating questions should be simple and easy to understand

### Interview Validity and Reliability

The research was able to get fourteen respondents for an interview and most of these respondents were employees of different companies.

*Validity* refers to the extent of accuracy of the results of the study. Validity of the results can either be internal or external. Internal validity refers to the analysis of the accuracy of the results obtained. External validity refers to the analysis of the findings with regards to whether they can be generalized (Ghauri & Grønhaug 2005, 65). Where measurements are used, there exist different types of validity; face validity, which describes the extent to which the measure used is reasonably capable of what is due to measure, convergent validity, which describes the extent to which the measurement used can bring similar results if used elsewhere and divergent validity that describes the extent to which one construct is distinguished from another (Ghauri & Grønhaug 2005, 83 – 84).

In this research, validity was taken into consideration. For example, because the interview questions were conducted by the researchers, it is designed on the basis of the researchers' needs in relation to the research question and so brings advantages in the sense that it measures exactly what the researchers intend to measure. The researchers therefore do not need to depend on other researchers for information on for example problem areas and relevance of the items included in the dimensions of the interview questions. Further still, descriptive, interpretative, and theoretical validity were taken into consideration.

*Reliability* refers to the stability of the measure used to study the relationships between variables (Ghauri & Grønhaug 2005, 81). The interview questions were designed taking into consideration the issues related to the problem and goals of the research and theories on the subject. It is therefore believed that the responses and results from this study are reliable.

Moreover, as this is a qualitative type of research, the accuracy and validity do not depend on the amount of sample size, instead, it depends on the richness and quality of information obtained, which cannot be quantified in percentages. Based on the continuous interview that the Knowledge Sharing Centre's management have been doing, what have been found in previous interviews were confirmed. Therefore, we can also say that this interview result might be a representation of the other potential participants.

Furthermore, as have been mentioned in the previous sections, the independency of the interview results are ensured by having the same guidelines while conducting the interviews, which are the same introduction and interview questions. Other than that, there were also an agreed transcription guidelines for transcribing the interview results as well as limitation of coders, which are only 3, to code the interview results in order to limit the subjectivity of interpretation. In addition to that, there were a lot of reviews done along the coding process to ensure the code consistency.

## 2.2 Internal Analysis

In this part of the report, the analysis of internal aspects of the Knowledge Sharing Centre is presented. The internal analysis was done by using canvass model, benchmarking with other similar company/platform, and analysing the internal information processes of the platform.

### 2.2.1 Canvass Model

The canvass model was chosen to be used for the internal analysis of the Knowledge Sharing Centre due to its current state, which is the development phase, meaning that the platform does not exist yet. This model has allowed us to visualize and clearly show the interconnection between all internal components of Knowledge Sharing Centre, which can be seen in Figure 7. Those components are customer segments, customer relationships, distribution channels, value proposition, key resources, key activities, partners, cost structure and revenue streams.

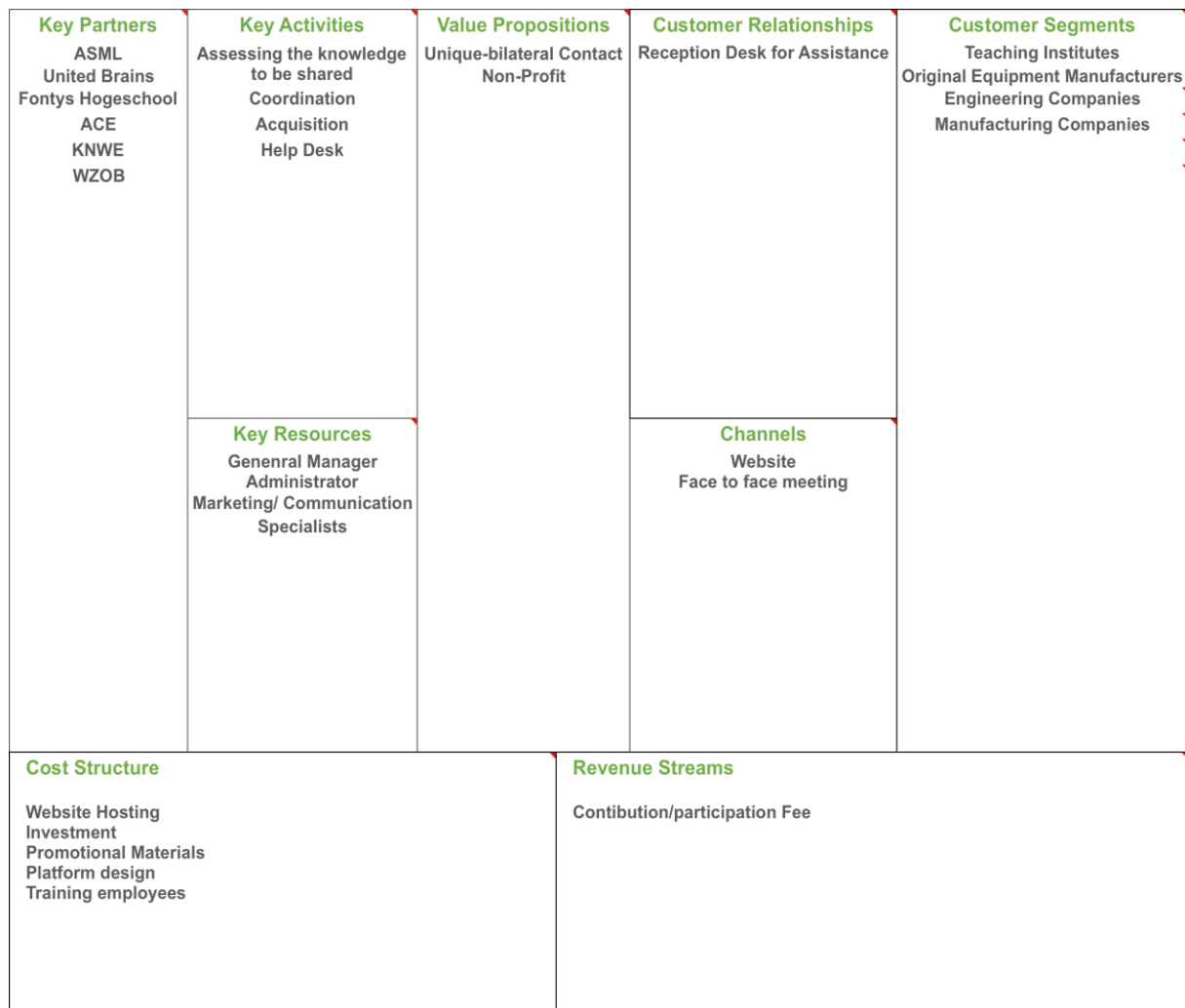


Figure 7: KSC Canvass Model

## Customer Segments

The customer segments that the Knowledge Sharing Centre tries to serve are the companies within the Brainport region, Eindhoven (in the beginning) and expand to companies all over the Netherlands in the later years. The customer segments has the following categories:

- Teaching Institutes
- Equipment manufacturers
- Engineering Companies
- Manufacturing Companies

In theory, there are 5 types of customer segments, which are mass market, segmented market, niche market, diversified market and multi-sided market. In this case, the Knowledge Sharing Centre's customer segments fall under the multi-sided market, which uses interdependent segments and connects them.

## **Customer Relationships**

To ensure good relationship with customers, Knowledge Sharing Centre chose to have a help-desk to assist customers in the process of joining as well as while already using the platform. This help-desk is based on human interaction, from which a person from the company will be directly in contact with the participating companies. This kind of service focuses on providing customer experience and interactive relationship with customers, which allows the customers to be actively involved with the development of the platform itself, and furthermore can be the co-creator of the service provided by the Knowledge Sharing Centre.

## **Revenue Streams**

The Knowledge Sharing Centre will obtain income from the contribution/participation fee that is collected from each participating company. Since the Knowledge Sharing Centre is a non-profit and independent platform, the collected contribution fee will be used only to cover the operational expenses made for maintaining the platform and services.

## **Key Resources**

The most important resource that the Knowledge Sharing Centre will have is its human resources. Since it is an automated platform, it only needs to be operated by some employees at the back end of the platform. These employees are divided into two categories, which are the general management and the competence management. The general management will contain of general manager, acquisition manager, administration, marketing and communication, whereas the competence management will contain of competence manager and several competence owner, who are experts on some topics in order to maintain the quality of the content provided by the Knowledge Sharing Centre.

## **Key Activities**

The following are the main activities to be performed by the Knowledge Sharing Centre:

- Assessing what kind of knowledge should be included in the platform
- Assessing the quality of the knowledge
- Coordination of the activities
- Acquisition of new participants
- Helpdesk (troubleshooting, administration, customer service)

## **Key Partners**

There are some important companies that the Knowledge Sharing Centre is currently cooperating with. This partnership is due to sharing of know-how, finance and technology. The current key partners of the Knowledge Sharing Centre are as follow.

- Fontys Hogeschool/United Brains
- ASML
- ACE
- KNWE
- WZOB

## Channels

Channels describe how and where a company communicates and delivers their value proposition and products to customers. More specifically, channels are the places and avenues companies use to create awareness of their brand/product/service, enable customers to purchase products and services, and ultimately deliver the overall experience of the value proposition to the customer (Osterwalder, A., & Pigneur, Y. (2010)).

By way of sharing knowledge via the Knowledge Sharing Centre, OEMs, manufacturing companies, engineering offices and educational institutes can share professional knowledge and find each other, whereby the right decisions and choices can be made during the design process. The educational institutes and manufacturing companies will assist each other in pooling this knowledge in an effective way, so that this leads from individual challenges to common solutions. The knowledge sharing and collaborations will be enhanced and stimulated by the Knowledge Sharing Centre so that the future of the Brainport region is safeguarded. To emphasise, this will be delivered through a platform, which is an infrastructure. Figure 8 shows an overview of the knowledge sharing centre platform

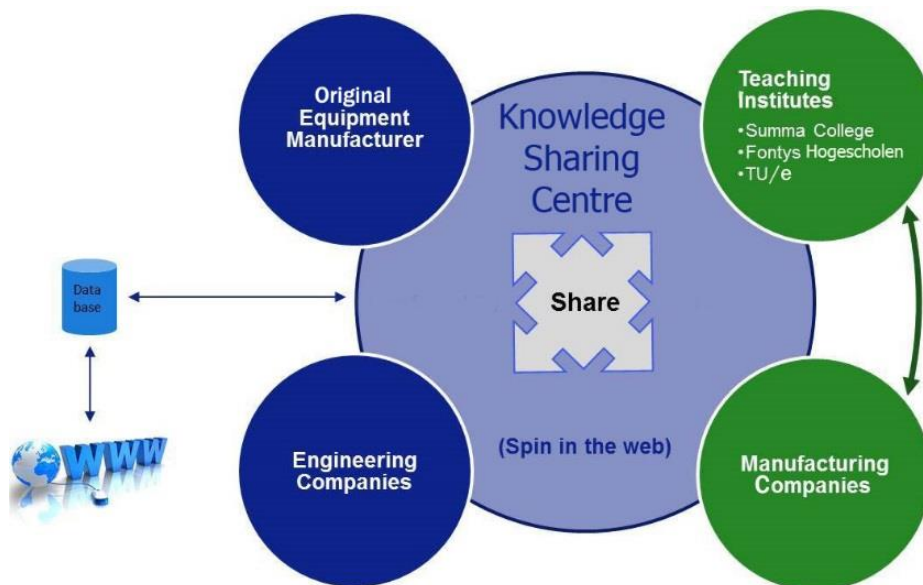


Figure 8: Knowledge Sharing Centre's Channel

## Cost Structure

The cost structure describes key costs associated with delivering the company's value proposition. Currently, in the development phase, the total cost for that is estimated to be €425,000 and after the start of its operation, the expenses is estimated to be €600,000 per year. The following are the main cost associated to the Knowledge Sharing Centre.

- Web hosting/platform costs
- Developers
- Technology
- Salaries
- Training
- Promotional materials



## **Value Proposition**

The knowledge Centre's value proposition constitutes the services and experiences that create a real or perceived value for customers. It comprises those elements that differentiate its services from competitors, such as the bilateral contact that can be created from the activity of knowledge sharing, which is a unique feature. It is also a non-profit organization and an independent body.

### **2.2.2 Benchmarking**

Other than using the canvass model, benchmarking has also been done to compare the Knowledge Sharing Centre with other similar company/platform that already exist. The purpose of this is to see the strength and weakness that the Knowledge Sharing Centre has in comparison to others. This action has also showed some opportunities for the Knowledge Sharing Centre as well as threads. Furthermore, this has helped to get some ideas on how unique the Knowledge Sharing is compared to the others and therefore can give direction on how to position itself amongst the other existing platforms to be able to compete with them.

Table 7: Comparison between KSC and similar platform/company

Comparison Aspects		Companies		
		Mikrocenturm	KSC	Brainport development
Target group	OEM	X	X	X
	Teaching institutes	X	X	X
	Manufacturing companies	X	X	X
	Engineering companies	X	X	X
	Suppliers	X		X
	Small and medium size companies and freelancers	X		X
	Trade associations and other organizations	X		X
	Food			X
	Government			X
Main activities	Training	X		X
	Event	X		X
	Sharing Knowledge		X	X
	Doing business	X	X	X
Quality control	ISO 9001	X		
Revenue streams	Contribution/Participation fee	X		
	Donation		X	
Legal structure	None profit		X	
	Profit	X		X
	Independent		X	
Cover area	Brainport region	X	X	X
	The Netherlands	X	X	X
	Europe			X
	World wide			
Channels	Websites	X	X	X
	Face to face meeting	X	X	
Facilities	Reception desk	X	X	X
	Meeting area			
	Training building	X		
Others	Privacy		X	
	Company website in the platform	X		

As can be seen in Table 7, the comparison was based on several important categories, which are target groups, main activities, quality, revenue streams, legal structure, covered areas, channels, and facilities. These categories were chosen based on the aspects on canvass model, however there have also been some additional categories based on what other platform/company have apart from the categories from the canvass model.

From the benchmarking result, it can be seen that Mikrocentrum and Brainport Development have larger target group than the Knowledge Sharing Centre, which is visible in the number of participants they currently have, which is so much more than the Knowledge Sharing Centre. Other than that, Mikrocentrum and Brainport Development offer more activities than the Knowledge Sharing Centre with providing training and events for the participants.

From the perspective of revenue streams and legal structure, Mikrocentrum and Brainport Development are focused more on the commercial side. They are profitable and non-independent body, which has some stakeholders. On the other hand, Knowledge Sharing Centre focuses just on knowledge sharing and not to make profit, which distinct it so much from the other platform/company. Due to that reason, it is also always forbidden for the Knowledge Sharing Centre to mention the website of the participating companies in the platform so it is not commercialised. Even though all of those three platform/company require contribution fee for the participating companies, but only the Knowledge Sharing Centre that will use that fee solely to cover its operational expenses.

Another important aspect to compare is the privacy of the participating companies. One of the advantages of creating a knowledge-driven platform is that the participants can search knowledge on their own, without other participants knowing their problem. On the other hand, in the other platform/company, the participants would search for knowledge by posting a question, which then will be send out to all the other participants to find who can best solve this problem. This results in all participants, who might be competitors, to know the problems that others have. Therefore it does not protect the privacy of each member.

## 2.3 Confrontation Analysis

After the internal and external analyses were done, the results of them were confronted using SWOT analysis and then followed by a confrontation matrix. In this section, the confrontation analysis is presented.

### 2.3.1 SWOT Analysis

SWOT analysis is a tool to list the strengths, weaknesses, opportunities, and threats of a business or organisation, which in this research, is the Knowledge Sharing Centre. From the internal analysis and external analysis, there were recognized strengths, weaknesses, opportunities, and threats for the Knowledge Sharing Centre, which are presented in Figure 9.

Internal	Strength	Weaknesses
	S1: Search engine in line with expectations	W1: Differentiation from competitors not clearly communicated
	S2: The intended knowledge in the platform covers broad variety of industrial topics - many categories	W2: Limited number of services intended to be provided
	S3: Management and key partners of KSC have strong network in the intended region and industrial field	W3: The financial funding of the company not clear yet
	S4: The intended non-profit and independent character of KSC	
	S5: Bilateral contact protects intellectual property and privacy (problem question will not be revealed to other participants) at the same time as it creates new opportunities	
External	Opportunity	Threats
	O1: Include more services aside from knowledge sharing	T1: Competitors have strong customer base
	O2: Located in a region with high concentration of potential participants	T2: Potential participants don't see the advantage of non-profit and independent set-up
	O3: Search engine can be extended with some more features	T3: Potential participants are afraid of commercialization
	O4: Creating a living community of experts	T4: Potential participants do not see where KSC is differentiated from competitors
	O5: Include both common and specialized knowledge as there is demand for both	T5: Potential participants are already participating in other sharing platforms or other initiative
	O6: Room for expansion - platform can cover even more topics, can expand to other locations - the idea is scalable	

Figure 9: SWOT Analysis

Following table links the strengths, weaknesses, opportunities, and threats to the conducted research and explains further what they mean.

*Table 8: Explanation of SWOT analysis*

S1	The interviewees generally confirmed, after showing them the search engine, that it fulfils their expectations about how the searching should work.
S2	As there is a demand for high variety of industrial topics and disciplines, covering many of them can be regarded as a strength.
S3 – S5	These are strengths communicated from the management of KSC and also found in the internal analysis.
W1	During conducting the interviews, it was found out that the differentiation from competitors is not being communicated well.
W2	The KSC is offering only the knowledge sharing and finding suitable bilateral contact, but other competitors offer more services as found from the research and also the interviewees expect more services.
W3	The financial funding was not the subject of this research, but it is not clearly formulated yet and interviewees had concerns about it.
O1	As found from the research, there is demand for additional services among some of the interviewees (please see section 2.1.3.4 Service Content and Form).
O2	Target group is highly represented in the Brainport region, therefore there is opportunity build a strong customer base.
O3	The interviewees expect the search engine to have some additional features (please see section 2.1.3.3 Information Content and Form).
O4	Most of the interviewees expect KSC to be a living community, connecting experts in an easy and fast way.
O5	There is a demand for both common (e.g. for new companies) and specialized knowledge (e.g. big or specialized companies).
O6	The first intention of KSC is to be established in the Brainport region, but this can be further expanded in the Netherlands and maybe later abroad. Also, the knowledge in the platform can be extended by additional industrial topics/fields, e.g. testing, measurements (please see section 2.1.3.3 Information Content and Form).
T1	The competing knowledge sharing platforms are already established and have strong customer base.
T2	The non-profit and independent set-up of the platform is not communicated clearly, so potential customers are either not aware of this or they don't see why this is an advantage of the KSC.
T3	The potential customers see threat in commercialization. Despite the intention of KSC is not to be commercial, extra attention has to be paid to ensure this in the future and communicate it well and clearly.
T4	The potential customers cannot see what KSC is adding to what the competition is offering.
T5	Many of the interviewees are already participating in the competing platforms, therefore they need to be convinced, why they should enter another platform.

### 2.3.2 Confrontation Matrix

Following the SWOT analysis, an analysis using a confrontation matrix was done. This matrix confronts the strengths, weaknesses, opportunities, and threats that were presented as the output SWOT analysis. The purpose of this matrix is to identify the strategy that should be taken by the Knowledge Sharing Centre.

The confrontation matrix is firstly done by seeing the combination of the strengths, weaknesses, opportunities, and weaknesses. There are 4 combinations, which are: strength – opportunity, strength – threat, weakness – opportunity, and weakness – threat.

After the identification of these combinations, scoring will be done for these combinations. The scoring is based on whether the combination of one of S/W/O/T aspects reinforces, worsens or has neutral effect on another S/W/O/T aspect. The scoring used can be explained as follows:

Table 9: Explanation of Confrontation Matrix Scoring

Combination score	Meaning of the combination of two S/W/O/T aspects
-2	Combination of the two strongly worsen each other
-1	Combination of the two mildly worsen each other
0	Combination of the two has no effect on each other
1	Combination of the two mildly reinforces each other
2	Combination of the two strongly reinforces each other

From this confrontation matrix, it resulted in a field of opportunity based on the combination of opportunity and strength as well as a field of threats based on the combination of weakness and threats. According to the result, recommendations were created for the Knowledge Sharing Centre, regarding what strategy should it perform, and how this is translated into goals and actions, which is presented in chapter 3.

The confrontation matrix is presented in the Figure 10.

		Opportunity						Threats					Total	
		O1	O2	O3	O4	O5	O6	T1	T2	T3	T4	T5		
Strength	S1	0	0	2	0	0	0	0	0	0	0	0	2	S1
	S2	0	0	0	1	2	2	0	0	0	0	0	5	S2
	S3	0	2	0	1	0	0	1	0	-1	0	0	3	S3
	S4	0	0	0	0	0	0	0	-2	2	-2	0	-2	S4
	S5	0	0	0	1	0	0	0	0	2	-2	0	1	S5
Weakness	W1	0	0	0	0	0	0	0	-2	-1	-2	0	-5	W1
	W2	-2	0	0	-2	0	0	0	0	0	-2	0	-6	W2
	W3	0	0	0	0	0	0	-1	0	0	0	0	-1	W3
Total		-2	2	2	1	2	2	0	-4	2	-8	0		
		O1	O2	O3	O4	O5	O6	T1	T2	T3	T4	T5		

Figure 10: Confrontation Matrix

Following table explains the combinations of the S/W/O/T aspects and what the general implications of these combinations are.

*Table 10: Explanation of S/W/O/T Aspects Combinations*

<b>Combination</b>	<b>Implications</b>
S1-O3	The strengths of KSC can be utilized to get the most out of the opportunities that open up in this market. These combinations create the field of opportunities.
S2-O4	
S2-O5	
S2-O6	
S3-O2	
S3-O4	
S5-O4	
S3-T1	The reinforcing (green) combinations indicate that the strengths reduce the threats. The hindering (red) combinations indicate that the threats weaken the strengths.
S3-T3	
S4-T2	
S4-T3	
S4-T4	
S5-T3	
S5-T4	
W2-O1	The weaknesses of the KSC (if not worked out) can lead to not utilizing the possible opportunities.
W2-O4	
W1-T2	The weaknesses of the KSC (if not worked out) will worsen the threats. These combinations create the field of threats.
W1-T3	
W1-T4	
W2-T4	
W3-T1	

The combinations of the S/W/O/T aspects and scores for the particular aspect are addressed in the conclusions and recommendations in the following chapter.

## Chapter 3: Conclusion and Recommendation

This chapter is written for presenting the concluded findings of the research analysis. Other than that, recommendations for the establishment of the Knowledge Sharing Centre are also presented in this chapter. The recommendations are presented firstly in Table 11. Moreover, some recommendations regarding the information process, change strategy, and future research topics are stated.

Based on the research and analysis, resulting into SWOT analysis and confrontation matrix, the group S205 was ready to draw recommendations for the management of the KSC. The strategy that was chosen for the Knowledge Sharing Centre is to utilize its strengths to get the most out of the opportunities and to work out its internal weaknesses to reduce the threats. These are expressed in goals (what) and actions (how) table below.

Table 11: Recommendations

Goals	Actions
Differentiate from the competitors	Develop even stronger differentiation from competitors; communicate the differentiation clearly to the potential customers. Communicate effectively strengths of the platform (non-profit, independent, privacy - explain why this is important)
Provide more services	Develop a plan for gradually implementing other services (eg. shared locations, open days, guest lectures, include teaching institutes)
Develop strong and living community of experts for knowledge sharing	Implement features demanded from the potential participants, cover broad area of industrial topics, connect experts in an easy, direct and fast way
Search engine should be extended	Make the topics interconnected by links, include great variety of industrial fields, keep it knowledge-driven (search knowledge and expertise by keywords)
Protect knowledge-driven character of the platform	Establish mechanisms to protect the knowledge-driven orientation of the platform
Ensuring the reliability, quality, and fairness of the shared knowledge	Establish processes and criterion of knowledge assessment by expert groups (future research)
Establishing rating system	Establish processes in convenient, easy, and agreed way (further discussion). And should be done in two levels, which are knowledge and business.

According to the SWOT analysis and confrontation matrix (Figure 9 and Figure 10), it can be seen that there is a serious threat that the potential participants could not see any differentiation point between the Knowledge Sharing Centre and other existing platform (T4). Other than that, the potential participants were afraid that there would be commercialization in the platform even though it is a non-profit, independent platform (T2 and T3). These threats are actually the result of the Knowledge Sharing Centre's weakness of not communicating its strength in an effective way. Therefore, group S205 highly recommend the Knowledge Sharing Centre to communicate better and more effectively to its potential participants regarding its uniqueness. The purpose of this is to gain the interest of potential participants to join the platform. This recommendation should be performed first because the platform needs participants. If companies do not see the benefit of joining the



platform, they would not be interested to join, and the establishment of this platform would not be as successful as it was expected. Some unique points that can be communicated better are listed below.

- Protection of intellectual property through bilateral contact
- Protection of privacy by not revealing questions/problems one company has to all participants. This is achieved by having a knowledge-driven platform
- Non-profit and independent platform, which can ensure not commercializing

In addition to that, the group also recommend the Knowledge Sharing Centre to develop broader services besides the knowledge-sharing platform. As can be seen in the SWOT and confrontation matrix, the Knowledge Sharing Centre has a weakness that it has only limited number of services. However, the potential participants would love to have more services to be included in the platform, which are already listed in chapter 2.1.3.4 Service Content and Form. These services are opportunities for the Knowledge Sharing Centre to make a living community to its participants and therefore give more added values for its participants. Thus, the group encourage the Knowledge Sharing Centre to think through about the opportunities it has, such as having a living community (O4) and room for expansion (O6) to get the most out of its opportunities, by providing more service using its strengths of having strong networks (S3), which would eliminate its weakness of only having limited services.

These two recommendations were chosen as the top recommendations for the Knowledge Sharing Centre because they address the field of opportunities and the field of threats, which are presented in the confrontation matrix (Figure 10)

### 3.1 Information Process Recommendation

The interview has resulted in some input regarding how the platform should be set up which give indication on how the information should be processed within the platform. According to the interview, the interviewees found that how the platform is structured now is convenient with the presence of search engine and filtering options. Other than that, the knowledge review by experts is also an expected feature of the platform. Therefore, with the knowledge the group obtained from the business information system (BIS) lectures as well as with the assistance of BIS lecturer, Mrs. Hoogenboom, there are some recommendations formed based on that interview result with regards to the information process, which are explained in details below.

There should be three main processes in the Knowledge Sharing Centre (Figure 11). These processes refer to the way that knowledge is handled at various stages within the organization. These main processes are:

- Knowledge Acquisition
- Knowledge Review/auditing
- Knowledge Sharing



Figure 11: Information Processes

#### Knowledge Acquisition

Knowledge acquisition refers to the knowledge that a firm can try to obtain from external sources. External knowledge sources are important and one should therefore take a holistic view of the value chain (Gamble & Blackwell 2001). Sources include suppliers, competitors, partners/alliances, customers, and external experts.

In case of the Knowledge Sharing Centre, only suppliers and customers are applicable to be the sources. This platform offers knowledge to customers, which should be obtained from the suppliers. However, in this platform, the suppliers and customers are the same, because all participants are free to both seek and provide knowledge. There is some information that should be acquired for the platform, which are:

- Knowledge regarding some topics within steps in new product development process, according to the V-model. This is obtained from the participant's expertise.
- Participants' business activities. This information is needed to provide information to knowledge seeker concerning what each company does, therefore can chose the right company to possibly partner with.
- Participants' contact information. This should be obtained to enable knowledge seeker to contact the knowledge provider.

In order to acquire great quality knowledge, there should be some guidelines made to assist the knowledge provider in presenting its knowledge. Making this guideline can make the next process (knowledge auditing) to be faster.

The means on how the knowledge should be obtained by the platform from the participants can be by email. Another option, a page where participant can submit knowledge can also be created. This page could contain of the various steps or checklist that should be completed before the knowledge can be published in the platform. This checklist can also perform, as a guideline so the knowledge obtained is up to Knowledge Sharing Platform's quality standard.

### **Knowledge Auditing/ Reviewing**

The traditional concept of an audit is an evaluation of a person, business, system, process, project, or product by an independent third party. For KSC, Knowledge from the participant should be audited or reviewed by the KSC experts.

After interviewing several representatives from different companies (potential participants) from different pillars of the Knowledge Sharing Centre, we detected several criteria that lead to high-quality knowledge content. These criteria assure that the knowledge shared in the platform remain up-to-date, relevant, and valid.

The following criteria are suggested for these processes.

- Standardized content formats. This includes a strictly limited number of knowledge content types, typically a short format of one to six pages (often labelled as 'notes') and a longer format ('reports') of ten to thirty pages. Each knowledge content type also should follow a certain generic content structure.
- An informal or formal peer review process that assures that the documented knowledge is valid and relevant. This should be followed by a formal check by an experienced competence manager and by an after-publication rating, including customers' feedback.
- A small set of information quality criteria that every contribution has to meet. The criteria are used to measure the quality of knowledge content produced by every company.
- A set of authoring guidelines that describe minimal requirements in terms of document content, style, size, ownership (e.g. updating responsibilities), and format (e.g., layout) as well as background (e.g., how to validate sources of information).

If knowledge auditing is done properly, it will ensure the quality of shared knowledge, which will create trust and reliability for the Knowledge Sharing Centre. The auditing and reviewing of the information will create methods and standards by which knowledge should be stored and published. For the storage of the knowledge, the database where knowledge are stored should be able to store knowledge in various forms, since the knowledge will also be published in different forms. These forms are video, document, image, excel sheet, etc.

## Knowledge Sharing

The Knowledge Sharing Centre platform will be helping the companies to search, browse and personalization of information. To enable participants to search for knowledge conveniently, there should be an advanced search engine as well as filtering criteria in the platform. These tools enable the participants to search knowledge based on specific keywords or available criteria. Participants who know exactly what topic they want to search can directly use the search engine and fill in the keywords of the desired information. On the other hand, for participants who do not know specifically their desired information can also start searching knowledge using the filtering criteria. Therefore, the use of key words in the search engine was highly suggested.

### 3.2 Change Strategy Recommendation

Change strategy is described as the plan for the organization to face changes, based on the recommendation created. This plan includes the analysis of the outcome, effect, and vision of change, possible resistance to change from the organization, and change strategy to influence the organization to accept the change recommendation.

In case of the Knowledge Sharing Centre, the platform is still in the development phase, which means that it does not exist yet. Therefore, the recommendation created for this research is mainly to help establish the platform and not to change the platform. The recommendations were focused on adding features to the platform as suggested by the potential participants. There will not be changes within the organization of the Knowledge Sharing Centre except for improving their way of communicating the Knowledge Sharing Centre to the potential participants. For this recommendation, we see that there is no major resistance that would appear from the management of the Knowledge Sharing Centre, who do the promotional activities for the platform. The management is always open to the suggestions as long as it will be beneficial for the platform development. Moreover, the reason and positive effect that is expected from the recommendation are also explained clearly. Therefore, there would be no change strategy for the Knowledge Sharing Centre, since no change will be done.

### 3.3 Recommendation for Future Research Topics

There are some research topics that were not covered in this research, however it would be very useful to be further investigated for the establishment of the Knowledge Sharing Centre. The research topics that can be done are the following.

- Specific knowledge that should be presented in the Knowledge Sharing Centre
- Suitable, acceptable, and sustainable financial finding of the company
- Mechanism of ensuring the quality and reliability of shared knowledge (rating system and expert group/competence owners criterion)

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## Annexes

### Annex 1 – Variable Chart & Interview Questions

#### Variable Chart & Interview Questions for Companies

Property	Dimensions	Indicators	Closed question	No.	Questions	Variables
Potential customer needs	Identity	Company position	Yes	1	In which of the four pillars (of potential participants of the Knowledge Sharing Centre) does your company/department fall under?	OEM, teaching institutes, engineering company, manufacturing company, don't know, other - specify
		Activities	Yes	2	Is your company involved in the [design, supply chain, procurement, supplier] activity?	Design, supply chain, procurement, supplier, don't know, other - specify
			Yes	3	In case of participation, would your company provide knowledge, seek knowledge, or both?	Knowledge provider, knowledge seeker, both, don't know, other - specify
	Context Information	Collaboration	Yes	4	If we speak in terms of the four pillars that would build up KSC, what other pillars is your company/department collaborating with?	OEM, teaching institutes, engineering company, manufacturing company, don't know, other - specify, no
		Function		5	What department do you work in?	
				6	What is your position in the company?	
				7	What is your function (task and responsibility)?	
	Bottleneck recognition	Process		8	What activities and tasks does your department have with regards to the New product development and V-model?	
				9	Explain with examples the steps of the process(es) where the department is involved? (related to the previous question)	
			Yes	10	How long does this process usually take?	Few days, weeks, months, years
			Yes	11	Who else is involved in particular steps?	Internal/external; departments/companies; design/supply chain, procurement, supplier = manufacturing, don't know, other - specify
		Bottleneck		12	What are the bottlenecks/difficulties that you face within new product development (also in terms of money, time, and quality)?	
				13	Can you give few examples of the bottleneck that you had experienced in the past?	
				14	How do you solve the bottleneck currently?	
				15	What information would you need sooner in order to overcome the bottleneck?	

		Yes	16	How often do you and your department face a bottleneck with respect to the lack of knowledge/expertise/experience?	Never, in few projects, in some projects, in many projects, in every project
		Yes	17	How often do you need an information, and don't know where to find it?	Never, in few projects, in some projects, in many projects, in every project
		Yes	18	How often do you need an information, and don't know who to ask about it?	Never, in few projects, in some projects, in many projects, in every project
			19	From who? (related to the previous question)	
			20	Give an example of an information that you or your department needed?	
			21	What is the cause of the lack of information?	
Usability	Usefulness	Yes	22	Do you think the Knowledge Sharing Centre would help resolve the bottleneck?	Yes, no, don't know, don't have an opinion
			23	Why do you think so? (related to the previous question)	
			24	In what way in your opinion can the Knowledge Sharing Centre resolve the bottleneck?	
Quality and certainty	Type of information		25	What kind of the information would you like to be provided? (for example process constraints, about materials usage, manufacturing processes)	
			26	In which form would you prefer it? (related to the previous question) For example videos, explanations, diagrams, etc.	
			27	How would you determine whether the information in the Knowledge Sharing Centre is the right one (also in terms of quality)?	
Tangibility	Usage of the platform		28	Describe, how you imagine searching and finding the information on the platform (website). Explain this in a detail.	
Accessibility	Channel		29	Do you find the way KSC is structured convenient/effective to obtain the information? Explain why. (Show the website)	
	Time scope	Yes	30	Within what time scope do you usually need to get the information?	Immediately, few days, week, two weeks, month, few months, more.
		Yes	31	Within what time scope would you like to get to the bilateral contact?	Immediately, few days, week, two weeks, month, few months, more.
Trust	Reliability of information		32	Would you like to have a rating/assessment system in the platform?	
			33	Do you think that a rating system can assure the reliability of the information in KSC?	
			34	Based on what criteria should the ranking/assessment work?	

		Feedback		35	In what way, would you like to give feedback on development of the platform?	
				36	In what way, would you like to give feedback on development of the knowledge portfolio?	
	Personal Attention	Attention from KSC		37	What kind of services would you like to be provided by the KSC? For example competence owners, expert groups	
			Yes	38	How often should be contact between business and KSC?	Never, regularly - specify, on occurrence
				39	If there should be contact between businesses and KSC, regarding what matter?	
		Bilateral contact		40	What kind of support, if any, should be during the bilateral contact? (legal matter, way of contacting, agreements templates, etc.)	
	Responsiveness	Customer service		41	For what kind of matters would you like to have customer service provided by KSC? For example troubleshooting, helpdesk, wish to participate	
				42	In what form the customer service should work? For example on call, e-mail, etc.	
<b>Not part of the questionnaire</b>						
	Additional	Questions for KSC			Do you have any questions regarding the discussed matter?	
		Remarks			Do you have any remarks or suggestions on how the platform should be set up or on any other matter?	
		Participation			Would be the participation in the knowledge sharing centre interesting for you? Why?	
		Additional comment			If you would like to know more, we can provide you with a contact on Mr. Frank van der Chijs	



## Variable Chart & Interview Questions for Teaching Institutes

Property	Dimensions	Indicators	Closed question	Questions	Variables
<b>Potential customer needs</b>	Identity	Company position	Yes	In which of the four pillars (of potential participants of the Knowledge Sharing Centre) does your company/department fall under?	OEM, teaching institutes, engineering company, manufacturing company, don't know, other - specify
		Activities	Yes	In case of participation, would your company provide knowledge, seek knowledge, or both?	Knowledge provider, knowledge seeker, both, don't know, other - specify
		Collaboration	Yes	If we speak in terms of the four pillars that would build up KSC, what other pillars is your company/department collaborating with?	OEM, teaching institutes, engineering company, manufacturing company, don't know, other - specify, no
		Function		What department do you work in?	
				What is your position in the institute?	
				What is your function (task and responsibility)?	
	Difficulties Recognition	Process		How does your institute cooperate with companies regarding NPD?	
				Explain with examples the steps of the process(es) regarding the previous question	
			Yes	How long does this process usually take?	Few days, weeks, months, years
			Yes	Who else is involved in particular steps?	Internal/external; departments/companies; design/supply chain, procurement, supplier = manufacturing, don't know, other - specify
		Difficulties		What are the difficulties that you face within teaching topics regarding NPD (in terms of time, and available knowledge)?	
				How do you solve the difficulties currently?	
				How do you guarantee that the taught knowledge is up to date?	
			Yes	How often do students of your department face a difficulties with respect to the lack of knowledge/expertise/experience?	Never, in few projects, in some projects, in many projects, in every project
			Yes	How often do the students need an information, and don't know where to find it?	Never, in few projects, in some projects, in many projects, in every project
			Yes	How often do the students need an information, and don't know who to ask about it?	Never, in few projects, in some projects, in many projects, in every project

				What is the cause of the lack of information?	
				In your opinion, how would the KSC be useful for teaching institutes in general, and for students in particular?	
	Usability	Usefulness	Yes	Do you think the Knowledge Sharing Centre would help resolve the difficulties faced by teaching institute with regards to new knowledge?	Yes, no, don't know, don't have an opinion
				Why do you think so? (related to the previous question)	
				In what way in your opinion can the Knowledge Sharing Centre resolve the mentioned difficulties?	
	Quality and certainty	Type of information		What kind of information would you like to be provided? (for example process constraints, about materials usage, manufacturing processes)	
				In which form would you prefer it? (related to the previous question) For example videos, explanations, diagrams, etc.	
				How would you determine whether the information in the Knowledge Sharing Centre is the right one (also in terms of quality)?	
	Tangibility	Usage of the platform		Describe, how you imagine searching and finding the information on the platform (website). Explain this in a detail.	
	Accessibility	Channel		Do you find the way KSC is structured convenient/effective to obtain the information? Explain why. (Show the website)	
		Time scope	Yes	Within what time scope do you usually need to get the information?	Immediately, few days, week, two weeks, month, few months, more.
			Yes	Within what time scope would you like to get to the bilateral contact?	Immediately, few days, week, two weeks, month, few months, more.
	Trust	Reliability of information		Would you like to have a rating/assessment system in the platform?	
				Do you think that a rating system can assure the reliability of the information in KSC?	
				Based on what criteria should the rating/assessment work?	
		Feedback		In what way, would you like to give feedback on development of the platform?	
				In what way, would you like to give feedback on development of the knowledge portfolio?	

	Personal Attention	Attention from KSC		What kind of services would you like to be provided by the KSC? For example competence owners, expert groups	
			Yes	How often should be contact between business and KSC?	Never, regularly - specify, on occurrence
				If there should be contact between businesses and KSC, regarding what matter?	
		Bilateral contact		What kind of support, if any, should be during the bilateral contact? (legal matter, way of contacting, agreements templates, etc.)	
	Responsiveness	Customer service		For what kind of matters would you like to have customer service provided by KSC? For example troubleshooting, helpdesk, wish to participate	
				In what form the customer service should work? For example on call, e-mail, etc.	
<b>Not part of the questionnaire</b>	Additional	Questions for KSC		Do you have any questions regarding the discussed matter?	
		Remarks		Do you have any remarks or suggestions on how the platform should be set up or on any other matter?	
		Participation		Would be the participation in the knowledge sharing centre interesting for you? Why?	
		Additional comment		If you would like to know more, we can provide you with a contact on Mr. Frank van der Chijs	

## Annex 2 – Introductory Text (Interview)

Good morning/afternoon Mr/Mrs..... Firstly, I would like to **thank you** for giving us the opportunity to have an interview with you. We believe that you are involved in a new product development process in your company that you worked in. Therefore from this interview, we would like to **gain more understanding about the bottlenecks** that you might experience during new product development process as well as your **thought about the Knowledge Sharing Centre** as a mean to help resolve those bottlenecks. The **result of this interview** would be very valuable for **setting up** the Knowledge Sharing Centre and hopefully it can improve the new product development to become more effective and efficient in terms of time, money, and quality. This interview will last for approximately **1 hour** and I will be the interviewer for today. The result will not be disclosed to other people without any relevance towards the project. Therefore, the information will be handled **confidentially**.

Then, I would like to introduce us a group. We are a group of second year students from **Fontys Hogeschool Eindhoven** studying Industrial Engineering and Management. We are currently doing a market research project for the **Knowledge Sharing Centre**, which is a knowledge sharing platform initiated by **ASML and United Brains**. This interview is done for the purpose of that market research, from which the result is expected to give indication of the expectations/demands of the potential participants with regards to the Knowledge Sharing Centre.

I will begin with **explaining you about the Knowledge Sharing Centre itself**. Knowledge Sharing Centre is an **independent, non-profit INFRASTRUCTURE** that would facilitates the activity of knowledge sharing between companies in their collaboration for new product development. Even though, this infrastructure is non-profit, each participant will have to pay **contribution money** (which need to be developed still) for covering the operational expenses of the platform. The **initiation** of this platform is due to the fact that there are a lot of **bottlenecks recognized** during new product development process, which makes the process to be inefficient and ineffective in terms of time and money. The **purpose** of this Knowledge Sharing Centre platform is to **enable more efficient communication** between companies so information/experience can be shared earlier in the process of developing new product.

Knowledge Sharing Centre will be presented in a form of a **knowledge-driven platform** that has a back office and front office. The content of it will be knowledge regarding a lot of topics, such as manufacturing processes including its design constraints, measuring, engineering, etc. The platform will contain of approximately **60% of the participant's knowledge**, which is a common shared knowledge. The other **40% is the intellectual property of a company**, which is protected. Each participant can look for the knowledge they need in the platform and it will show the highlight of the desired knowledge as well as the contact of companies who owns the knowledge. Using this information, participants can contact the owner of the knowledge and eventually have a **bilateral contact**, from which the knowledge owner will share its knowledge, possibly the other 40% of the knowledge that is not presented in the platform, to the knowledge seeker. From this bilateral contact, new supply chain is also expected to grow.

There are **four types of company** that are expected to be the potential participants of the Knowledge Sharing Centre. This is usually called as the 4 pillars of the Knowledge Sharing Centre. Those pillars are original equipment manufacturers, engineering companies, manufacturing companies, and teaching institutes within the Brainport region. These four pillars are chosen as the potential participants as these pillars are the parties that are most likely to be involved in the new product

development, or can also be said to participate in some new product development steps within the V-model.

NOTE: Make it interactive – do you know/use the V-model?

The **V-model** is a typical model for new product development used by companies in the Brainport Region. The V-model consists of several phases, which are the **design phase, prototyping phase, and testing/manufacturing phase**. Within the design phase, a system specification of product is broken down into sub-module, which will be used as a basis for making the conceptual design and detailed design. Once the detailed design is established, it will be realized into a prototype. This prototype will be tested in accordance to the design and specification stated in the design phase. If everything goes well in the testing phase, then the product is ready for manufacturing. Therefore from the explanation before, we can say that there are 3 parties that are involved in this model, which are the designers, manufacturer (supply chain), and procurement (for mass production).

As we have talked to companies during the Precision Fair and several workshops, we found out that there are bottlenecks within that process experienced by those companies. That is why we would like to interview you and find out more about the bottlenecks that you might have experienced.

(start interview)