MESG

MESTRADO EM ENGENHARIA DE SERVIÇOS E GESTÃO

Defining a service design strategy: A practical application in a technology company aiming to grow faster than the market

Beatriz Sousa Rodrigues

Master Thesis

Supervisor at FEUP: Prof. Alcibiades Guedes

Supervisor at Consoveyo: Engenheiro Rui Pacheco

U.PORTO

FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

2020-07-DATA

"Nothing in life is to be feared, it is only to be understood.
Now is the time to understand more, so that we may fear less."
Marie Curie

Abstract

In this new era of industry 4.0, the opening for investing in innovative technological solutions for the maintenance service is growing fast and, as in any technological advancement, the window for being an innovator and early adopter of such technologies closes fast. The aim of the project is to develop a new service that allows an expert technician to remotely identify failures and decrease the downtime of the customers of a technology company. The combination of service engineering and service design tool through the phases of the service development were applied considering the aspects of 4.0 industry with a catalyser of the demand for the remote service: COVID-19. The service was designed and developed to fulfil this demand and the design and a full analysis of the service potential, to design, to defining the marketing and sales strategies and activities, to analysing the financial prospects of the service were made. In this report it is presented all the phases to develop the service and their outcomes as well as an analysis of the collected data and considering this result the directions of further applications for the solutions will be determined.

Resumo

Nesta nova era da indústria 4.0, a abertura para investir em soluções tecnológicas inovadoras para o serviço de manutenção está a crescer rapidamente e, como em qualquer avanço tecnológico, a janela para ser um inovador e um precursor na adopção de tais tecnologias fecha-se rapidamente. O objectivo do projecto é desenvolver um novo serviço que permita a um técnico especializado identificar remotamente falhas e diminuir o tempo de paragem dos clientes de uma empresa tecnológica. A combinação de engenharia de serviços e ferramenta de concepção de serviços através das fases de desenvolvimento do serviço foram aplicadas considerando os aspectos da indústria 4.0 com um catalisador da procura do serviço remoto: COVID-19. O serviço foi concebido e desenvolvido para satisfazer esta procura e foram feitas a concepção e uma análise completa do potencial do serviço, a definição das estratégias e actividades de marketing e vendas, e a análise das perspectivas financeiras do serviço. Neste relatório são apresentadas todas as fases para desenvolver o serviço e os seus resultados, bem como uma análise dos dados recolhidos e, considerando este resultado, serão determinadas as direcções de outras aplicações da solução.

Acknowledgments

I would like to express my appreciation to my supervisor at FEUP Professor Alcibiades Guedes and to Engº. Rui Pacheco and Engº. Björn Scherer for the support and guidance throughout the development of this project. Without their guidance and engagement, this project would not be possible

I would also like to thank all the people involved somehow in this that gave in their time and knowledge for this project to be a reality. I would also like to thank Körber Group and Consoveyo S./A.'s management team for depositing their trust in the project and future prospects of the service-to-be-developed and also for the opportunity to work on it.

Finally, I would like to thank my family and friends, not only for their uncondicional support, but for always encouraging me to freely chose and go after the things that I want and teaching me not to give in but deal with the obstacles that might come with those choices, for that I'll be forever thankful.

Table of Contents

Table of Images

List of Tables

List of abbreviations

AGV: Automated Guided Vehicle

B2B: Business to Business

BMC: Business Model Canvas

CAPEX: Capital Expenditure

COVID-19: Corona Virus Disease 2019

CPS: Cyber-Physical Systems

DMS: Document Management System

EFACEC: Empresa Fabril de Máquinas Elétricas

F.A.Q.: Frequently Asked Questions

FT: Fast Track

GDP: Gross Domestic Product

HOS: Head of Services

IHIP: Intangible, Heterogenic, Inseparable and Perishable

K.O.: Knockout

KISD: Köln International School of Design

KLS: Körber Logistics Systems

MTTR: Mean Time to Repair

OMV: Overhead Monorail Vehicles

OPEX: Operating Expense

RGV: Rail Guided Vehicle

SOMS: Self-organizing manufacture system

SSME: Service Science, Management, and Engineering

UC: Use Case

UCS: Use Case Scenarios

USP: Unique Selling Proposition

VPN: Virtual Private Network

WFH: Work from Home

1 Introduction

There are several factors that impact the way that the consumers behave, and the customers behavior shift the market and the way they consume goods and services. Lima (2019) cited Martín-Peña and Bigdeli (2016) and said that when that are times of economic crisis the product demand can get stagnated, and that kind of stagnation can lead to an increase in the opportunity and need for services.

There is no possible way of predicting, right now, what is going to be the impact of COVID-19 in the industry, especially in the service industry. Taking Martín-Peña and Bigdeli (2016) analysis in past situations it is possible that the product industry suffers a decrease in demand and the service economy grows. There are few studies and reports about changes already happening in the market worldwide. In an article for McKinsey & Company Guzman, Prema, Sood and Wilkes (2020) describe the task of trying to keep delivering to the customer as unique, especially for companies that rely highly on in-person interaction. They also say that Organizations are responding quickly and working schedules are changing to work-from-home (WFH) measures. Moreover, Rio (2020) wrote that companies should consider analysing and upgrading maintenance strategy.

With the growth of investment in automation the number of production employees has decreased significantly and with that there was an increase of investment in production equipment, and maintenance employees (Garg & Deshmukh, 2006). Furthermore, the industry 4.0 is based on the “smart factory” concept, and that concept carries a need for improvement in the maintenance in order to maintain efficiency in production (Masoni et al., 2017). A way of improving the maintenance process, considering also the current economy situation with the pandemic, is through innovation and a lot has been talked about involving smart devices and even augmented and mixed realities in the maintenance service delivery.

Maintenance service level is key to reduction of downtime reduction, therefore, reduction of operational costs. The objective of a good maintenance service level is to have the availability of the equipment working at its maximum with a condition that allows the production to maintain a certain level of quality, in a cost- effective way, following safety and environmental standards. (Pintelon & Gelders, 1992)

1.1 Project background

Consoveyo is a global leading expert for automated material handling and storage systems. . Its history goes back to the EFACEC Group when, in 1984 the Automation and Robotics department was created. The first project was delivered in the following year. In 1991 the department became a subsidiary of the EFACEC Group following the growth of demand for innovation and the new independent company was called EFACEC Automação e Robótica S.A. In 2010 EFACEC Engenharia e Sistemas was created, grouping several different companies, EFACEC Automação e Robótica S.A. included, and in the next year a Company called EFACEC Handling Solutions, S.A. was carved out from it, with an English name to enhance positioning as a worldwide supplier.

In 2015 the company was acquired by Körber Group, a German technology group to be a system integrator company under the umbrella brand Körber Logistics, amongst others companies such as Aberle GmbH, Langhammer GmbH and Riantics A/S (Product Solutions), Aberle Software GmbH,

Cirrus Logistics, DMLogic, HighJump, Inconso GmbH and Voiteq (Software) (See *Image 1 - Körber Logistics Structure*). Consoveyo works in a B2B model in an exchange of products and services that support the automation of factories and warehouses (Consoveyo, 2020).

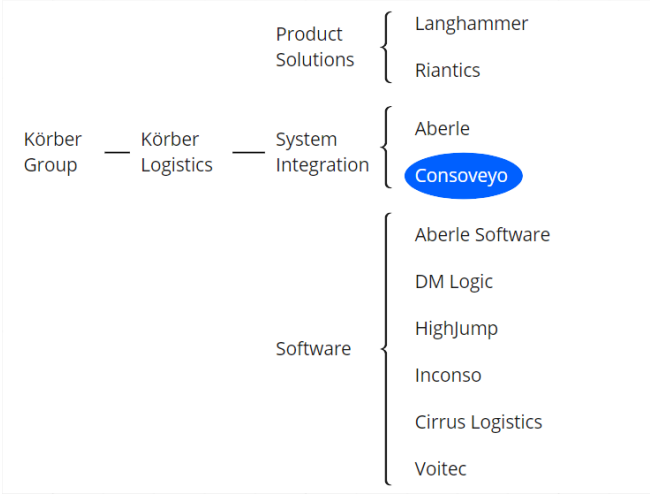


Image 1 - Körber Logistics Structure

With headquarters in Portugal, Consoveyo has offices in Czech Republic, Spain, India, and Singapore, delivering automated handling solutions and customer services to customers worlwide.

As a system integrator, Consoveyo designs and builds turnkey solutions for intralogistics applications such as automated storage, handling, internal transport, picking and order fulfillment.

As a product supplier, it provides an extensive range of products from its own portfolio according to customer requirements.

As a service provider, we bring our customers life cycle services along with comprehensive, efficient and cost-effective solutions designed to fulfill the material flow's specific requirements.Consoveyo

Consoveyo as a company that started as a department, turned into an independent company focused on developing a intralogistics equipment, maintaining until last year, a small portfolio of services that would support the system integration and product solutions business. In 2019, Consoveyo launched a servitisation program. The objective of the company is to consolidate its service portfolio, increase its customer satisfaction and the grow its service sales and revenue.

1.2 Research Objectives

The main objective of the project is to design an enhanced remote assistance service, applying industry 4.0 technologies, through the use of service design and service engineering tools, methods and processes. The Körber Xpert View project seeks to offer Körber Group's Companies a solidly built service and increase the value offered to the customer by having a solution that will support the customer service and mainly corrective but also preventive maintenances in a attempt to reduce customers downtime thus, reducing customer operational costs.

Also, by understanding competition between companies and the need to create innovative services, the goal is to create a sustainable competitive advantage in maintenance service market. This service will add value to the already existing maintenance service provided by the companies of Körber group, so the expectation is to increase the customer perception of service quality as well as the security quality of their machinery.

Lastly, the final objective is to understand how combined tools from different methods can built a proper product service development process to support design and pilot and rollout a new innovative service for a group of companies to support the remote maintenance service already created and develop a competitive advantage for the companies in question.

1.3 Report outline

The report developed for the project has the following structure: in the first chapter there is an introduction to the project commenting on the main topic of the project, the motivation for it and the company's background, and following that there is a description of what are the objectives aimed to be achieved with the project. In the second chapter it is possible to see an overview of literature, and that overview is what is used to reach the methodology and understand context of the project.

The third chapter showcases the methodology that was used and what was the purpose of choosing it for the research as well as what was the structure chosen and the sequence of activities and what were the management tools that were used to develop the new service. The fourth chapter is where it will be presented the results of the applied methodology and the outcomes of the service development process.

Lastly in the fifth chapter the conclusion of the report will be presented. In the conclusion chapter it will be presented the main outcomes of the project as well as if the goals were achieved and what other possible conclusion were taken from the project, as well as future expectations for the service developed

2 Literature Review

2.1 Industry 4.0

The fourth industrial revolution has, according to Thangaraj and Narayanan (2018) three aspects, they are the digitization of products and service offerings, the introduction of innovative digital business models and the digitization and increased integration of vertical and horizontal value chains. Based on a highly advanced digitalization within factory buildings the combination of internet technology with future technologies (the smart objects) lead the industry into a new paradigm shift. With the digitization and interconnection of products and things, that is called the internet of things, is an important driver that contributes to ensure competitiveness and promising additional revenue.

2.1.1 The Industrial Revolutions

Since the beginning of industrialization technological leaps have led to paradigm shifts, that is what is known today and the industrial revolutions (Lasi et al. 2014). The Industrial Revolutions are divided in four (see *Image 2 - The Industrial Revolutions (Source: Author)*), and it happened with the increasing demand for goods and services all around the globe. In the beginning of the production of goods, everything was handmade, and the distribution was made locally, since taking one good to distant places took too long, then manufacture changed dramatically with the industrialization, that happened because of a crescent need for goods. (Thangaraj & Narayanan, 2018)

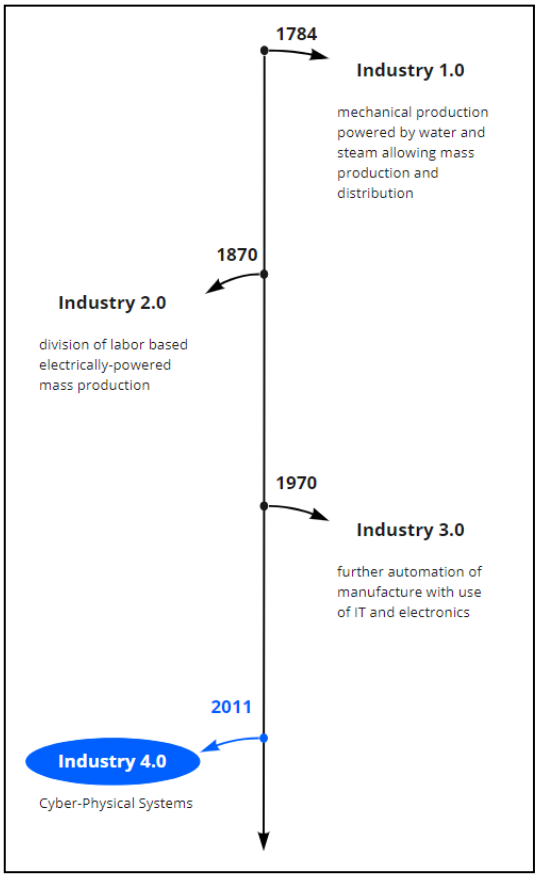


Image 2 - The Industrial Revolutions (Source: Author)

The first industrial revolution happened in the end of the 18th and beginning of the 19th century when mechanization of production powered by water and steam was introduced to the world. The systems powered by water and steam allowed a revolution in transportation as well and it had a huge impact in the industry, cause with this the industry had now, not only mass-production, but mass distribution of goods.

In the beginning of the 20th century the power source was no longer water and steam, now it was electricity and each machine had their own power source. In this period there was also an increase of management studies that support the growth of efficiency and effectiveness of companies and started with the division of labour. It was also in this period that people first heard of lean and just-in-time principles of production.

The third industrial revolution happened in the second half of the 20th century, it came with new technologies such as electronics, telecommunication, and the computer. This period increased the level of production with a new automation system.

The fourth revolution is also known as Industry 4.0 or Industrie 4.0and it was introduced for the first time at the Hannover fair in 2011 and announced officially in 2013 by the Germans as a strategy to be looked at as a pioneer as industries that are revolutionizing the manufacturing sector (Da Xu & L. Xu & Li, 2018). This new revolution is the incorporation of emerging technical advancements to improve industry to deal with the global changes. According to Lasi, Fettke, Kemper, Feld & Hoffmann (2014) industry 4.0 is a collective term for a larger number of current concepts, therefore, it is not possible to have an exact definition on individual cases, so they listed essential components of the revolution.

The current revolution is the Fourth revolution, that is also known as Industry 4.0 or Industrie 4.0 and it was introduced for the first time at the Hannover fair in 2011 and announced officially in 2013 by the Germans as a strategy to be looked at as a pioneer as industries that are revolutionizing the manufacturing sector (Da Xu & L. Xu & Li, 2018). This new revolution is the incorporation of emerging technical advancements to improve industry to deal with the global changes.

2.1.2 Industry 4.0 Concepts and Components

According to Lasi, et al. (2014) Industries 4.0 is a collective term for a larger number of current concepts, therefore, it is not possible to have an exact definition on individual cases, so they listed essential components of the revolution. The first mentioned component is the Smart Factory. According to Wang et al (2016) for a factory to fulfil its role of transforming raw material into finished products there a systems and subsystems involved in that process, and that subsystems can be involved in either management and production and at different hierarchical level, aligning the subsystems will support controlling the flexibility and consistency of manufacturing, and that the industry 4.0 seeks to integrate the hierarchical subsystems to transfer the traditional factory into the smart factories.

B. Chen, et al. (2017) says that a smart facture is a factory based on an automated and digital manufacturing that uses technology information platforms, such as a cloud platform for example, that way they can improve the management of the manufacturing resources. Still according to the authors, the smart factories' goal is to improving marketing and production as well as enhancing the control of the production process by reducing manual intervention, that all happens with the analysis of the manufacturing data.

The second component mentioned by Lasi, et al. (2014) is the Cyber-Physical Systems (CPS), that, according to the authors is s fusion between the physical and digital levels, that, when included in production and product level leads to a system where it can no longer be differentiated what is the physical and what is the digital representation of the system. Because of the development of technology, that has led to a higher affordability and availability of sensors and data gathering systems, the use of those grew fast and generated a high volume data, known today as Big Data, and the Cyber-Physical System is what is developed to manage Big Data and leverage the interconnectivity of the machines with the digital systems to reach the goal of the CPS (Lee, Bagheri and Kao, 2014)

The third component of the 4th revolution is the Self-organization. The first time the term Self-Organization was used was in 1960s associated with general systems, then in the 70s and 80s it became a popular concept amongst the physicists and researchers in the field of complex systems, it was only then that it was introduced into manufacturing systems, called Self-organizing manufacture system (SOMS). The author who presented that was Kubota, and it was defined as an system that is able to decentralize the management and manufacture performance as well as organize its software and hardware by itself. (J. Zhang, et al., 2017)

The next mentioned component is about the New systems in sales and procurement, since there are a bigger separation and individualization in both sales and procurement and its processes. Industry 4.0 had a big impact in procurement and sales, a process that used to be merged together and followed the same footsteps, are now electronic and two individuals, separated processes that are individualized. The 5th component mentioned had the same effect of the previous one, the process has been individualized. It is the New systems in product and service development, that, according to Zhang, et al. (2017) is a process that is approaching open innovation and product intelligence and memory.

The last two components mentioned are the adaptation to humans and the corporate social responsibility. One of the biggest reasons why the revolutions happen is the fact that the human needs are constantly changing, so the industry needs to adapt to the needs and wants an now more than ever there is a higher need of customized products and service as well as a

bigger care for sustainability and environmental issues and companies are being charged by the overall consumer about those topics.

2.2 Service Design

Service design was first heard of in 1982 when Lynn Shostack wrote an article to the European Journal of Marketing, in this first scenario the denomination of service design was targeted as a marketing tool, since Shostack was a marketeer herself. Then in 1991 a professor from Köln International School of Design called Dr. Michael Erlhoff introduced service design in an academic world by creating a course for it. Since then the area has developed. In the beginning it was seeing as a marketing tool, but with the growth of servitisation all over the world the amount of companies that provide goods adopting a service driven strategy as a differentiator grew and more and more companies are adopting a posture of developing and designing services to offer to the customers.

Stickdorn and Schneider (2010) found two approaches to define service design, the first one was from an academic point of view, where they gathered a few concepts and the main focus of the concept was that Service Design is a way of creating and improving services in order to make them useful and desirable to the customers. The second approach was from a designer's point of view, that said, basically that service design was an application of design tools, methods, and processes to the development of a service. If we gather these two approaches to create e concept that can cover both approaches, we can define service design as a method to create or improve services that uses design tools and processes in order to make those services useful and desirable for the customers.

Still on defining service design in order to understand its purpose, Gibbons (2017) defines Service Design as the activity of planning and organizing a business's resources, being that people, props and processes, in order to directly improve the employees' experience and, indirectly, the customer's experience. Meaning that service design is focused on defining and designing the operational processes that are necessary to deliver the service to customers. It also says that in Service design every component must be designed and integrated and divides these components in three: people, processes, and props.

- People: this component includes and stakeholder of the service as well as individuals that might be indirectly affected by the service, a few examples would be the customers, employees, partners and so on.
- Processes: this can be defined as the workflow through which the service will be delivered, those activities of the workflow can be performed by either the users or the employees.
- Props: These components are both the tangible and intangible artifacts needed to deliver the service, it could be intellectual property or even a physical prop.

To connect Service Design to existing concepts and tool Danielle Cantalanotto (2018) said that service design is connected to other innovation design fields as family, and to explain how it works the best example are the religions, just like Catholics, Protestants and evangelist believe in the same god but practice their faith in different ways the Service design is connected to the other design innovation fields but they all target the same purpose. (see *Image 3 - Service Design Genealogical Tree (Source: Cantalanotto, 2008)*)

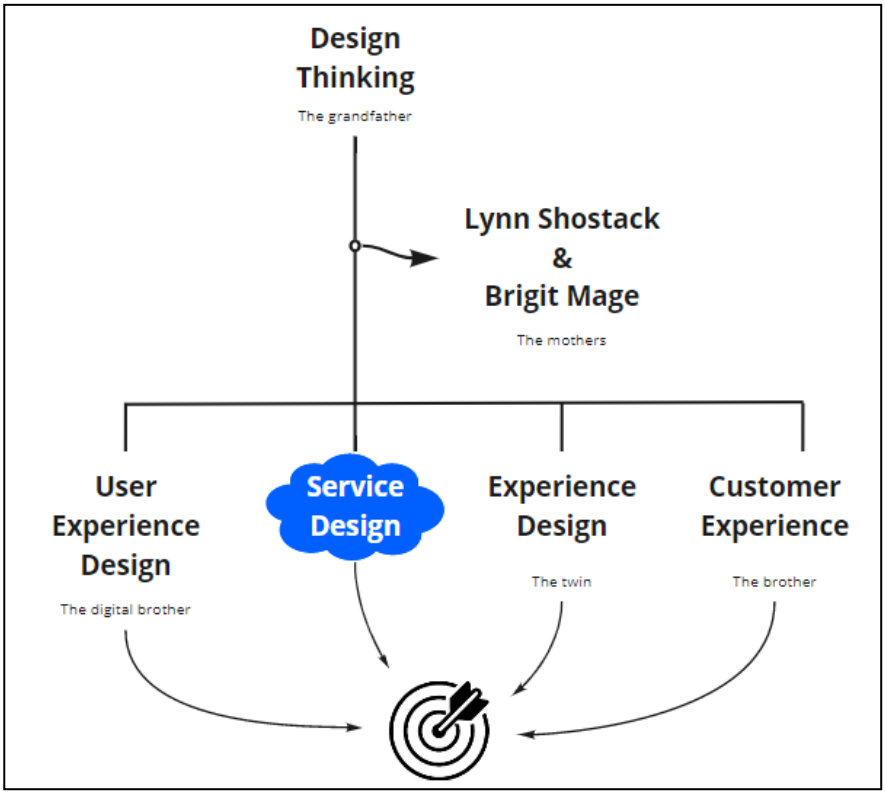


Image 3 - Service Design Genealogical Tree (Source: Cantalanotto, 2008)

- The Grandfather: Cantalanotto (2018) describes Design Thinking as the predecessor of Service Design, many tools and processes of design thinking are applied till this day onto service design. It is a movement that started in the 60' s and it is, according to Cantalanotto, describes how the designers are able to find and create innovative ideas and products, design thinking is a creative process that leads to innovation, so that method can be used by anyone, not only by designers.
- The Mothers: The mothers are not a method but two people that were the biggest names in Service Design. The first one was already mentioned earlier in this chapter, Lynn Shostack, that came up with the term "Service Design" in 1982 in an article published at Harvard. The second name is Brigit Mage, the president of Global Service Design Network and a Professor at KISD in Germany, meaning that Brigit is the mother of service design today.
- The twin: Experience design is, in many ways, very similar to Service design. Cantalanotto says that Experience Design is focused on, as the name says, the experience, saying it is more a philosophical idea, but that Service design does the same, that's why it is as the Service Design twin in this tree.
- The digital brother: User Experience Design is taken in the book as the digital brother because it is focused on the interaction between humans and digital products and services, even though, originally, the term was defined for what Service Design is today.
- The Brother: Customer Experience is taken as the brother in this tree, mainly because it is "the product of an interaction between an organization and a customer over the

duration of their relationship" (Cantalanotto, 2019). Again, the purpose is the same, but this method is focused on the customer and comes more from a business background then from a design one.

As said before, this tree scheme (see *Image 3 - Service Design Genealogical Tree (Source: Cantalanotto, 2008)*) shows the connections between those different methods that have the same purpose, in the end: improving the relationship between humans and organizations (Cantalanotto, 2019). That said, the next step into understanding service design is understanding the key point of turning from an industry design industry to a service design one.

According to Polaine, Løvlie and Reason (2013) the generations of service design can be divided in two, the first one was focused on the design of goods, turning industrialization in a force for it, using the tools, methods and processes of service design to understand and figure out how to use the industrial technology to satisfy the consumer's primary needs, exploring how the industry could create products In a more efficient way so that it would be more useful for the customer. That wave of design had a huge impact on the improvement of the standard of living in the developed world. Still according to Polaine, Løvlie and Reason (2013), today that standard of living reached its natural plateau and consumers are saturated with goods consumption. Polaine, Løvlie and Reason even says that our needs changed with time a with societal and technological advances, and says that the today's needs are about having a good health, reduce energy, reduce consumption of resources, developing a leaner transportation solution and financial systems that are more resilient.

2.3 Service Science

The importance of services has grown and gained more space in the global economy while the importance of goods declined, in the past ten years. (Berry, et al. 2006). Bullinger et. al talk about an ongoing transformation of the market regarding competition and even its own structure and points liberalization and deregulation of a wide range of service sectors as the triggers of this movement and still, Locklove and Patterson (2015) talks about the increase on the size of the service sector, that happened globally and highlight that the share of employment between agriculture, manufacturing and service changes with the development of a nation, he says that the service factor grabbed a bigger slice of the pie.

With that, the studies in services begin to rise, such as service science research, that achieved, according to Böhmann et al. (2014), new important conceptual advances and seeks to build an evidence-based design with an implementation and evaluation of real-world services. Service science is a specialization of system science that has the goal to explain hierarchically complex systems by addressing artificial and natural world. (Salvendy & Karwowski, 2010, p. 5)

Service is defined as an economic activity that is performed from one party to another and employed in time-based performances and offers value to the customer (Locklove and Witzel, 2011, p. 15). Service is defined, usually, by things that they are not, for example, they are not tangible, it is not possible to store services, they are not possible to transport and so on. (Spring & Araujo, 2009). Spring and Araujo, citing Lovelock and Gummerson (2004) says that the service main characterization in known as IHIP, meaning that the service is (I)ntangible, since opposite to products, services are not tangible, and the customer cannot experience the service before purchasing it, (H)eterogenic because services are difficult to reproduce in a homogenic manner, they usually are more personalized, (I)nseparable because

the delivery or consumption and production of a service are happening in parallel and (P)erishable because it is not possible to store a service, once provided, being delivered of not, the service is done and over.

Service science is a systematic study of service design, management, and delivery. Still on definition, Melao (2015), says that Service Science is an initiative that was called Service Science, Management, and Engineering (SSME), initially. The author also says that there are some drivers that were catalyzer to the growth of the Service Science study, such as the growth of the service sector in the impact on the gross domestic product (GDP) and employment in developing countries, the increasing complexity of service delivery processes and the technological advances.

2.4 Servitisation

Servitisation brought questions of what services are and how they are provided while giving a rise to the reconsideration of products. Under a product-based model, especially in B2B, it is the customer responsibility to maintain, repair or modify the purchased good (Spring & Araujo, 2015). Manole and Bier (2018) cited by Lima (2019) says the term servitisation in not only increasing a company's service business orientation, but also encompasses the transformation from product-centric to a customer-centric approach.

According to De Lille et al. (2015) the existing literature recognizes servitisation's complexity and focus on identifying and discussing the challenges that manufactures find during this transition process towards delivering advanced services. The authors also say that those identified challenges help manufactures knowing what they can expect when going through the servitisation process but that, unfortunately, this literature provides little guidance on how to deal and tackle those challenges.

2.4.1 Servitisation challenges

One of the challenges of undergoing a servitisation process is within the organizational structure, is changing the cultural mindset of a product-centric approach to a customer-centric one, this is due to the fact that the process of creating value changes during the process (Zhang & Banerji, 2017). According to Kinnunen & Turunen (2012) another challenge within this topic is the proper communication, internal and external, of the new services being developed and provided. What is also challenging is the search and acquirement of qualified professionals.

Another big change is within the business model, from being a unidirectional value delivery to value co-creation, there are also changes in value co-creation as well as resource utilization, pricing and costs structures. (Zhang & Banerji, 2017). Regarding the development process, since services, unlike products, cannot be stored (Meier et al., 2010) but both products and services are necessary for a servitized company (Zhang & Banerji, 2017).

The area where big challenges appear is the Customer Management area, since in services, the value is co-created, making the customer a part of the production of the service customer (Locklove and Witzel, 2011) and with that the companies that once worked on producing and delivery now work with a whole new type of customer relationship. Also, Zhang and Banerji (2017), citing Barnett et al (2013) the company must build a long-term customer-relationship to ensure the longevity of their services.

The last challenge mentioned in Zhang and Banerji (2017) study is Risk Management in three different aspects: financial, operational, and external. The financial managements Neely (2008) was the first to research about the possible financial risks with servitisation, and on that research found that the companies that went through the process needed to increase investment and that can offset the financial returns in the early stages of the servitisation, but investing in services can be risky, even though it can help growing the business it, sometimes, does not represent the financial return expected. The next risk is the operational risk, as said before operation is one challenge of the process and it has a lot to do with the changes of cultural also mentioned above.

2.4.2 Benefits

There are several possible benefits of going through the servitisation process, Perillo & Marqui (2015) say that the academic debate around the possible financial benefits of servitisation is growing, but is not easy to quantify since the companies show themselves reluctant to share the revenue growth. Companies that adopt servitisation tend to improve profitability while maintaining and a revenue growth. (Baines et al., 2009). With that ther should also be a consideration of the possible financial risks mentioned in the previous subchapter.

Another benefit is the marketing benefit, because marketing service can increase the appealing to customers as well as awareness (Perillo & Marqui, 2015). That benefit is highly connected to the change of culture and communication inside and outside of the company. What can also support the marketing benefits is the construction or reconstruction of the business model and understanding of the offered value as well as the delivery of the service. (Osterwalder & Pigneur, 2010)

The third benefit coming from the challenges faced are the strategic benefits, those are connected to the resource allocation and cost structure (Zhang & Banerji, 2017). The strategic benefic also comes with the company achieving a competitive advantage and being able to sustain it through unique offers (Mathieu, 2001).

3 Methodology

This chapter has the objective of presenting the methodology that was applied in the Körber XPERT View project. It starts explaining the approach chosen for the design of the service and why that was the method chosen to do so. The second part of it shows what were the tools and how they were applied to come to the final design in order to achieve the objective of the project.

The research method used in the project was a qualitative approach. Creswell (2009) defines Qualitative Procedures as an inquiry that employs different philosophical assumptions; strategies of inquiry, methods of data collection, analysis, and interpretation and adds that qualitative procedures rely on text and image data, having a set of unique steps in data analysis. David Silverman cited by Chamaz (2008) says that by studying a phenomena that occurs naturally, qualitative researchers can define how interaction ensues and what meanings it holds, and answering the "how" and "what" questions must precede the "why" questions.

There are several different types of approaches when It comes to Qualitative Research, it usually begins with assumptions and the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem. A Qualitative Research should be done when there is a need of a deeper understanding of a problem or situation, when the problem is complex and people need to be heard, to understand context or setting in which the participants in a study address the problem or situation and that demands an extensive study and efforts form the researchers and participants. (Creswell & Poth, 2017)

Quoting Creswell and Poth (2017): "Some authors believe that by reading about a study, discussing the procedures, and pointing out issues that emerged, the aspiring qualitative researcher will have a sense of how to conduct this form of inquiry" and the authors still say that the process of designing a qualitative study can differ according to the problem but still, they designed a default process:

- Assumptions: the process begins, not with method, but with assumptions, about the problem, central to qualitative inquiry. The researcher askes open-ended questions to have a better understanding of the problem.
- Data Collection: then, the researcher looks deeper into a variety of sources of data, something the authors call "words and images". They also say that there are, traditionally, four types of data sources: interviews, observations, documents, and audio-visual materials. This collection of data is bases on the open-ended questions made on the previous step, and new questions might emerge.
- Analysis: Afterwards, the collected data is analysed by the researcher. One helpful way to see this process is to recognize it as working through multiple levels of abstraction, starting with, recognizing, also, the interrelated set of activities of data collection, analysis.
- Report: The researcher writes, then, a report on the analysis made during the inquiry, and reports the findings and results of the analysis.

The type of approach used for the qualitative research methodology in this project was the Case Study approach. Many authors do not consider Case Study as a methodological

approach for qualitative studies, but Creswell and Poth (2017) say that it is an approach in which the investigator explores contemporary, real-life bounded system or systems and reports a case description. The approach begins with the identification of the case, in this scenario, the case is the Körber Xpert View project. To summarize, a Case study focusses on developing an in-depth description and analysis of the case by studying an event, a program, an activity, or more than one individual using multiple sources of data collection and developing a detailed analysis of the case (Creswell & Poth, 2017) with the an structure that is very similar to the main structure mentioned above, but adapted to the type of methodology.

- Identifying case: the researcher must identify the case and define if the Case Study approach suits the research. This approach is commonly used when there is a case and a need for an in-depth understanding of it. For this project, the Use Case is the Körber Xpert View solution and its development, with the goal of understanding the project and why it was developed.
- Introduction and description of problem: Then, the researcher assesses the case and defines the problem and investigation. the case is then defined, described and the problems are also presented.
- Data collection: A data collection in a case study comes from different sources and types. The authors recommend a combination of some of those six: documents, archival records, interviews, direct observations, participant observation, and physical artifacts.
- Analysis: From the collection, the researcher analyses the data. That analysis con be embedded in one aspect of the case or it can be a holistic analysis of the whole case, and, in the case of the project, the analysis made throughout the whole project is holistic.
- Report: The last phase is reporting the meaning of the case, whether it is learning about the issue or an unusual situation. It is the lessons-learned phase of the study.

To better understand the approach of the project it is also important to emphasize the main aspects of service design and industry 4.0 and how those two merged into a service 4.0 design in the project in question. The interesting part of understand how those two theories work together in practice is that while one of the challenges of the industry 4.0 is to merge the systems to work towards people the service design and service development tools are human-centred in its majority, making a service 4.0 design approach a good one to be applied to this type of project.

The reason why the approach must be focused on people is because everything about the industry 4.0 or services is about people, customization, the digitalization of processes to make employees life easier, the understand of the customers need, wants and desires. Nelles, Kuz, Mertens and Schlick (2016), talking about the role of the human in the 4.0 industry talk a lot about the systems being developed to support humans in the workplaces and says, as an example, that “The aim is to put the human into a position where he or she can quickly make the right decisions on production and handling orders more efficiently through intelligently processed data”.

Another situation that rose through the development of this project, that worked as a catalyser was the world COVID-19 pandemic. Since the project is towards the improvement of the remote maintenance using the smart glasses reducing the quantity of times the maintenance team needs to go to the customer site, the heads of service together with the board of Körber

Group decided to speed up the project and launch it to pilot paying customers in the middle of June.

The last variable on deciding the approach of the project was that the company was already working with a pre-defined structure for product and service development. The approach is divided in seven different phases:

- Potential: The potential of the service is analysed, that phase happens in parallel with the next three phases.
- Prototype: Testing the functionalities of the platform and possible scenarios of the service.
- Service Design: What is going to be the structure of the service, how it will be delivered and what were the techniques and tools for the design.
- Marketing & Sales: All the marketing and sales activities are defined
- Rollout: How and when the service will be provided.
- Product Lifecycle: definition of product optimization, controlling, family and so on
- Management: Product retrospect (Market and financial development of the time of product) and lessons learned.

In each phase service design and service engineering techniques are defined and used in the projects, and the structure can be adapted to each different product or service development. In the case of this project, the structure (see image X) used was the company's structure from the potential phase until the end definition of marketing & sales.

After defined the approach of the new service's development, the next step was to define which techniques to use according to service engineering, service design and previous service and products developments made by Körber Group, to find the best fit and have all material, structure and service understanding to launch the solution.

3.1 Potential

As said in [3.1.] this phase ran out throughout the whole project, with all the new information new potential was evaluated. The first step in this phase is to do a market analysis, to understand its need and how would the new service or product be accepted in the market. The market analysis deals with a snapshot of the market, it can be done via projective procedures also on the future of the market. According to Theobald (2016) a good market research is well-founded in correctly recording relevant facts for the project and that can be complex depending on the market or the number of actors influencing those factors, the author also says that the market research can happen in a whole market or a specific market segment. In the potential phase there is also some analysis of sales potential made throughout the whole project gathering information to understand how far the new service would reach on the customer segment chosen.

3.2 Prototyping

Houde and Hill (1997) define prototyping saying that it is not what something is but how this something is used to explore or demonstrate some aspect of the future artifact. The authors also built a model of what prototypes prototype (see *Image 4 - A model of what prototypes prototype (Source: Houde & Hill, 1997)*) that shows three dimensions that build the

prototyping purpose: “Role” refers to the purpose, function of the artifact, the “Look and feel” asks about the sensorial experience of using the artifact and “Implementation” is about questions about the techniques and components through which the artifacts performs the functions. This model has the goal of separating the design problems in three classes of questions that usually demands different approaches (Houde & Hill, 1997)

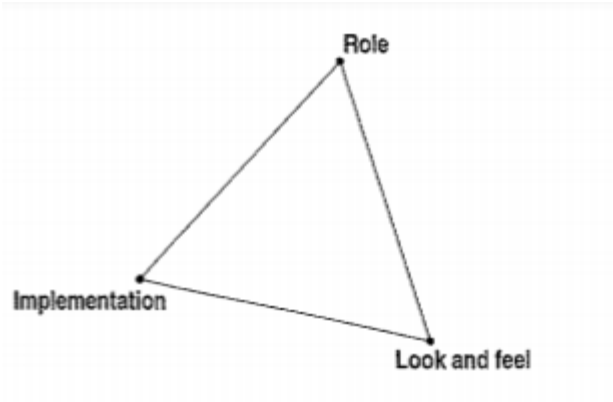


Image 4 - A model of what prototypes prototype (Source: Houde & Hill, 1997)

Service prototyping can be defined in different ways and is an area that was described to need more literature and research about. There are, though some definitions of what service prototype is, for example, Blomkvist and Holmlid (2010) citing the online repository for Service design tools, say that service prototyping is a tool for testing the service and observing how the users interact with it in a situation where the service will exist. And a lot also is talked about the importance of prototyping a service, a good prototyping appeal to the emotions and avoid drawing attention to features, costs, and applications that can clutter the conversation and derail the excitement factor and that service prototypes are usually done with role-playing and scenario building (Rae,2007).

For this project, a few types of prototypes were done. The first technique was understanding and building the scenarios, with the Use Case scenarios done in the previous phase of the project, the scenarios of usage of the service were define and afterwards it was used the role-playing technique, that is good for simulation, roleplay has the ability of enhancing one’s knowledge on content, and this interaction will allow for the participants to process the information gathered while doing the role playing activity at different levels. (Clapper, 2010) And a customer journey map, done to assess the scenarios of usage and support proofing the hypothesis. In the project this activity was used to test the connections found during brainstorm and Mindmap activities and also to test the scenarios and the functionalities of the platform.

3.3 Service Design

This is the phase where the focus was to build the whole scope of the service a well as understanding all the aspects of its delivery. In this phase a lot of different service design tools and other different analysis and development methods were applied, such as

- Brainstorming: The introduction of the brainstorming technique was made in 1953 by an American advertising executive called Alex Osborn. He created the technique when he figured that the usual business meeting did not generate ideas. The technique was

gathering a group of people with the objective of generating ideas to solve a problem (Hidayanti et al., 2018). He also created four rules in order of the technique to fully work:

- No criticizing ideas: it was important to maintain a good environment and not criticize ideas, the objective of the tool was to generate the most ideas and only afterwards to filter those ideas. This way no one would feel uncomfortable to share the ideas.
- Encouraging large quantities of ideas: As said previously, brainstorming is a technique to gather as many ideas as possible. The most ideas are generated the greater are the chances of a good fit for the solution of the problem
- Building on other's ideas: After gathering the most ideas as it can possibly in a certain amount of time, it is also a good practice to combine ideas, so Osborn says that participants should be very free and even encouraged to mix ideas or continue other's ideas
- Encourage every idea: every idea is welcome during a session of brainstorming, even if it sounds silly or too obvious. (Hidayanti et al., 2018)

The brainstorming technique became popular very fast and it is used until this day in several different areas. It can be done by a group or by an individual. In the case of the project the brainstorming tool was used to create connections and generate scenarios where the customers could use the solution. It was combined with a sort of Mindmap of the connections between the users of the Körber XPERT View solution (Hidayanti et al., 2018).

- Mindmap: According to Buzan and Buzan (2006, p. 261) mindmapping was a technique created by Tony Buzan, president of The Brain Foundation. Mind map is a tool that is used to brainstorm thoughts and put in a better way for visualization. It can be used as a management tool in different areas of a company, for example it can be used to document a company's structure, this way it is easier to present it to someone else. In the project the Mindmap was created in a different format, to brainstorm the users of the solution and how would they connect to each other through it.
- Use Case Scenario: Rosson and Carroll (1996) define Use Case scenarios as a description of the meaningful activities that users engage with a system. Using a scenario do define a Use Case is a common tool used in requirement engineering for software, this tool is used for task-centred design of those software. What happens during this type of analysis is that it starts with a narrative of a sequence of tasks that a user has to follow to reach a certain goal and for each narrative the user can have different outcomes, that allows the deeper analysis of the system (in the case of the project testing, again, the platform and functionalities) and to understand what are the situation where the user will need to interact with the system. (Davis & Dawe, 2001). For this project, the Use Case scenarios were created for each interaction defined in the brainstorm and Mindmap activities, the purpose was to identify what could be offered to the customer, and how that would e delivered to them.
- 6W1H: This tool is a variation of the 5W2H method that is a highly used analysis and according to (Nagyova et al., 2015) the method was created by a Sakichi Toyoda to be used at Toyota as a tool for development of manufacturing methodologies and it is an

introductory method to analyse a problem or situation. The method was then used outside of Toyota in different areas and with different purposes. The method can be used, for example, in journalism to gather information about a story, it is also used to define information systems and so on (Chung et al., 2009). The principle of the method consists in making questions that were originally designed to find a root cause of a problem but can be used for different purposes and analysis. The questions are what, why, where, who, when and how but for the project an extra question was defined, "Whose", then

  - What: The answer to this must be a brief description of the situation in a simple, concise way so that everyone can understand
  - Why: In here is the reason for the situation described in what has occurred
  - Where: This is where the situation is/was encountered
  - Who: This is where who is affected by the situation described is displayed?
  - When: To answer this question, one must know when did the situation described occurred or will occur
  - Whose: This is about ownership, who is responsible for this situation
  - How: This is about how the described situation happened or will happen.

- Business Model definition: "A business model describes the rationale of how an organization creates, delivers, and captures value" (Osterwalder & Pigneur, 2010, p. 14). In the Business Model Navigator Book (Gassmann et al., 2014, p 7) the author says that now, for a company to have and maintain a competitive advantage are no longer based on the product or service alone, but also the business model. The author also defines business model as a system with four dimensions:
  - The Customer: That dimension is to understand who will be targeted for the service of product being developed. This step is important because, even in other models of service and product development, this is a critical stage, understanding the relevance of the customer segment allows a company to know where to allocate marketing efforts, for example, as well as maximizing sales opportunity, it can also be used to identify services and products opportunities.
  - The Value Proposition: Understanding what is the value that is being offered to the customers and more importantly, communicating those values. In the definition of a Business Model it is important to understand what is the value that is being offered to the customer and how it will be catered to them
  - The Value Chain: The value chain is about how the service that will be offered to the customer. A company that has control over their value chain activities at a lower cost will gain competitive advantage over its competitors (Selçuk, 2019). For the business model definition, it is necessary to understand how to work the value chain and how the process of production and delivery will happen.
  - The Profit Mechanism: The fourth dimension is all about cost and revenue aspects, it is basically understanding how your service or product is going

to work commercially. It is the answer to a central question for any service or product to be developed and delivered, that is on how the value is produced for all the stakeholders.

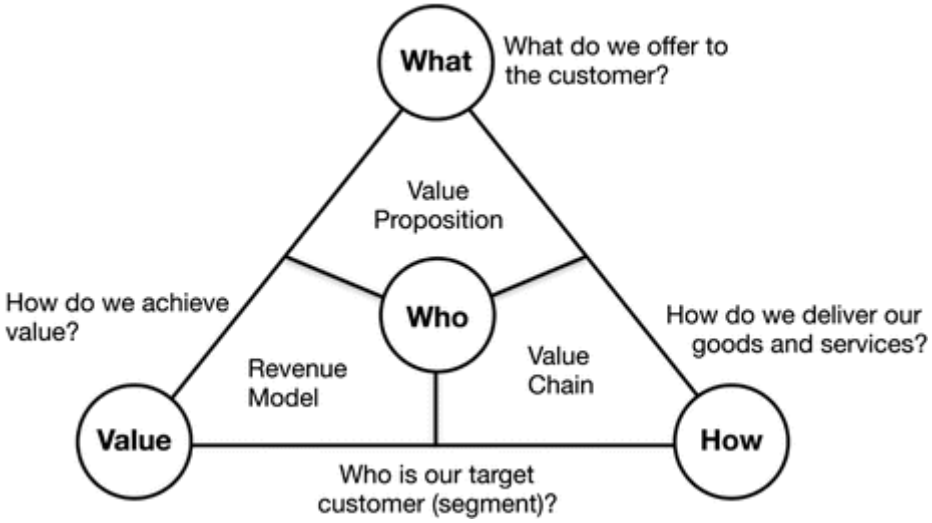


***Image 5 - The four Business Model's dimensions (Source:* Gassmann et al., 2014)**

Those four dimensions together form a triangle shaped diagram (see *Image 5 - The four Business Model's dimensions (Source:* Gassmann et al., 2014)) and the understanding of every dimension is how one understands the business and can choose a business model that best fits the necessities of the product or service you are providing and in addition that can lead to a competitive advantage. For the project that analysis was made with the support of two other tools, and then a business model was chosen for each of the Use Cases that were seen as different services and the result was sent to be analysed by the head of services of all companies participating on the project.

- Service Blueprint: Another tool used for the design of the service was the service blueprint is a tool that allows the visualization of the relationships between the different service's components. A Service blueprint is just like a part two of the Customer Journey Map, it is a good approach to services that involve several touchpoints, or require a cross-functional effort (Gibbons, 2017). Blueprints can support designing the customer experience and the service delivery as well as being a good tool to identifying opportunities to increase and optimize that delivery and the interaction with the customer. A Service Blueprint has four key elements that are mandatory to build a complete blueprint, the first one is the Customer Actions element, the second is the Frontstage actions, that are the main interaction with the customer, then the Backstage Actions, that are the actions that interact with the frontstage employees and finally the Processes or Support Processes, internal processes that support both the front and backstage employees actions.
- Value Proposition Canvas: A Value Proposition, as previously said, is a proposed value to be delivered to the customer, and a Value proposition canvas is a tool to support the understanding and building of this value. The Canvas is divided in two parts, Customer and Provider. On the customer side there are three parts to be filled,

the first one is the customer jobs, that is what the customer must do in order to generate value to the product or service provided, then there are the customers pains and gains with the service, in the project case. On the Provider side there are also three blocks, the first one is products and services, that are basically what will be offered to the customer, then the gain creators, that is what generates the gains in the customer side and that pain relievers, that will be what are the proposed solution to relieve the customer's pain in the other part of the canvas. The creation of this canvas was used to support both the choosing of the business model and also to support sales argumentation.

- Business Model Canvas: Coes (2014), citing different authors says that the concept of Business Model is relatively new in the business scenarios and research field, and that concept grew due to the growth of communication and technology and came with different tools, such as the Business Model Canvas (BMC). BMC is composed by nine building blocks that combined show all the necessary components to fully understand a business. Those blocks are: customer segment, value proposition, channels in which the service or product will be delivered to the customer segment, the customer relationship that is a communication channel with the customer segment, usually where the value proposed is communicated, the revenue streams where it is showcased the revenue generated when the value is correctly offered to the customer, key resources that shows what are that main resources necessary to generate the product or service, the next is key activities that just like the resources are the main activities necessary to produce the service or product, the key partners are the main partners responsible for key outsourced activities and resources and the last block is cost structure in which, as the name says, is where the data about the costs necessary to produce the product or service to be provided. In the project that was one of the tools used to choose a business model.

3.4 Marketing & Sales

In order to have and maintain a competitive advantage, a business must generate customer value, and that value is created with the benefits offered to the customer and how they'll be delivered (Guenzi & Troilo, 2007). According to Boles et al. (1999, 1997) cited by Matthyssens & Johnston (2006) the actual business is quite complex, mostly because of the globalization process and the changing on the customer needs and desires. Several contextual issues sort of force marketing and sales to be closer functions and the salesperson plays an important role as they are the direct contact with the customer (Matthyssens and Johnston, 2006). Achieving alignment in sales and marketing means that the sales and marketing organization fully understand what are the offers of the market segment and what are the best opportunities.

The Marketing & Sales phase was divided in several different activities to create a plan for both selling and marketing the new service. To have a better overview a Marketing 4Ps or Marketing Mix presentation suits best this understanding and covers the activities for this phase of the project. Marketing 4Ps is a conceptual framework to support the identification of the main management decisions that are needed for marketing the value offered to the customers in a long-term of short-term marketing strategy (Goi, 2009). Borden (1965) was the first one to use the marketing mix strategy, but his original marketing mix had 12 elements, namely, product planning; pricing; branding; channels of distribution; personal selling;

advertising; promotions; packaging; display; servicing; physical handling; and fact finding and analysis. Then, in 1964, McCarthy decided to refine the technique by having grouping all the elements into 4: product, price, promotion, and place and building a marketing 4Ps model is a good way of achieving competitive advantage. (Goi, 2009)

The first P is the Product Mix, and, according to Singh (2012) the product or service has to be the starting point of any marketing activity and for that there are a few activities that need to be studied and understood and developed. The idea of this methodology is to ask and answer questions regarding the new service in order to best understand and develop it. A good designed offer is key to influence purchase decision, also it is good to use innovation and technology, after that is understanding the usefulness of the product or service to understand the values that are being offered to the customer. For the project, the previous phase was used as support of the building of this element of the 4Ps marketing tool. To answer the propper questions about the product Mix it was also necessary to define the USP of the service and what was it, what was its purpose and what were the functionalities and activities that supported it.

USP, or (U)nique (S)elling (P)roposition is an essential tool for advertisers to create a unique and meaningful way to set their product apart from the competition and encourage people to buy the product. According to Rosa (2015), Reeves designated USP as a type of publicity as "reason-why" as that is presents an argument that is specific and leads the customer to buying the product or service. Felix (2012) says that the best wording for USP is asking what makes that product/service more unique, more valuable, and more visible in the market? With that the product or service to be provided is unique and fills a special niche to be successful. Still according to the author one of the biggest mistakes is not making sure they are unique and that the customers see them as the best option of the market.

As for the second P, Price Mix, it is of common understanding that pricing is key to competitive advantage and because of that it is also important to choose well the pricing approach. In this step of the development process two approaches were considered, a value-based approach, that is an approach where the calculation of price is made based on the values that are offered with the product or service to be provided, and the second approach was cost-based pricing approach, that, as the name says, bases the price on the costs during the development and delivery of the service of product (Sight, 2012) and also customer specific pricing, to have the price to be as fair and acceptable in the market as possible.

The third P is Place and this decision is interesting both for services and products, because this usually refers to distribution channels, those channels can be virtual or physical. Those channels can be through retail, internet, wholesale, direct sales, multi-channel, or peer to per. For this project, the decision of the customer segment highly influenced the distribution channel. Placing is a critical variable and has to be assessed for its value-generating potential and assessing this variable can be good for relationship maintenance, enhancing customer contacts in the future and influences the way in which the important customer contact takes place. (Zineldin & Philipson, 2007)

The last P speaks about promotion, and those activities are meant to choose the channel in which the customer will be communicated about the service or product. This P is all about creating awareness of the product in the market and is a way the marketeers disseminate the the relevant service information to their customer. The promotion channels chosen to inform the Körber customers about the was made with the support of the Körber Marketing team and the decision was also made in a superior level.

4 Results

This chapter will be where the outcomes of the applied methodology mentioned above will be shown and discussed as well as the future prospect of the service after the project. The results presentation will follow the methodology structure; therefore, it will be divided in the phases of the project, showcasing the outcomes of each phase.

4.1 Potential

As previously mentioned, this phase happened in parallel with other phases and the potential of the service and its delivery was studied in different times and with different approaches in some of the phases. The reason why the potential was done in this way was to support the decisions regarding the development of the service and its usability.

The first step on studying the potential of the service was done in an early stage of the process A study of the market and even possible partners for the service was done, prior to the beginning of the project, that research was an extensive collection of data. The research allowed studying the viability of the service and how and why start investing in the service. It also supported the decision of the partner that would provide the software and hardware.

Lissy (2019), collected and analysed the data to justify the investment on the smart glasses as a toll for supporting remote maintenance. Within the findings and analysis of the research some points were highlighted:

- Revenue potential: The revenue potential could not be proofed to be high based on benchmarks and information from within the service industry.
- Profitability potential: This proofed to be valid throughout the research due to efficiency and cost reduction with the reduction of travel and training.
- Customer Satisfaction: Validated during the research due to the potential of reducing the customer's downtime
- USP: The companies would no longer be the first to adopt this kind of service, but would still be an early adopter of the innovative solution
- Competitive advantage: Using the argument of the early adopter the company could see a prospect of developing a competitive advantage

The analysis also had a conclusion of the solution eventually becoming a hygiene factor, so the company would have to invest in it while still a innovation and the type of service was in the early adoption phase, also claimed that the solution would have a me-too factor once implemented, meaning that the other companies would like to experiment the offer. Finally, the market entry strategy was defined and the company was supposed to invest in the solution while it still was in a early adopter phase, as previously said, be ready to offer after the service becomes a me-too, having a defence strategy, and plan ahead and enable the process to increase the customer satisfaction. (Lissy, 2019, internal data).

The research had the objective of assessing the viability of the service and the requirements for hardware and software to decide which company would be a partner of Körber and with

which kind of glasses (augmented, virtual or mixed reality). To have those results some data needed to be gathered and analysed and the research was divided in the following topics:

- Definition of target group: here, it was defined that the targeted groups would be Körber's service technicians, that would be the internal customers of the solution, the end customer, for which the solution would be provided and any 3rd party integrator.

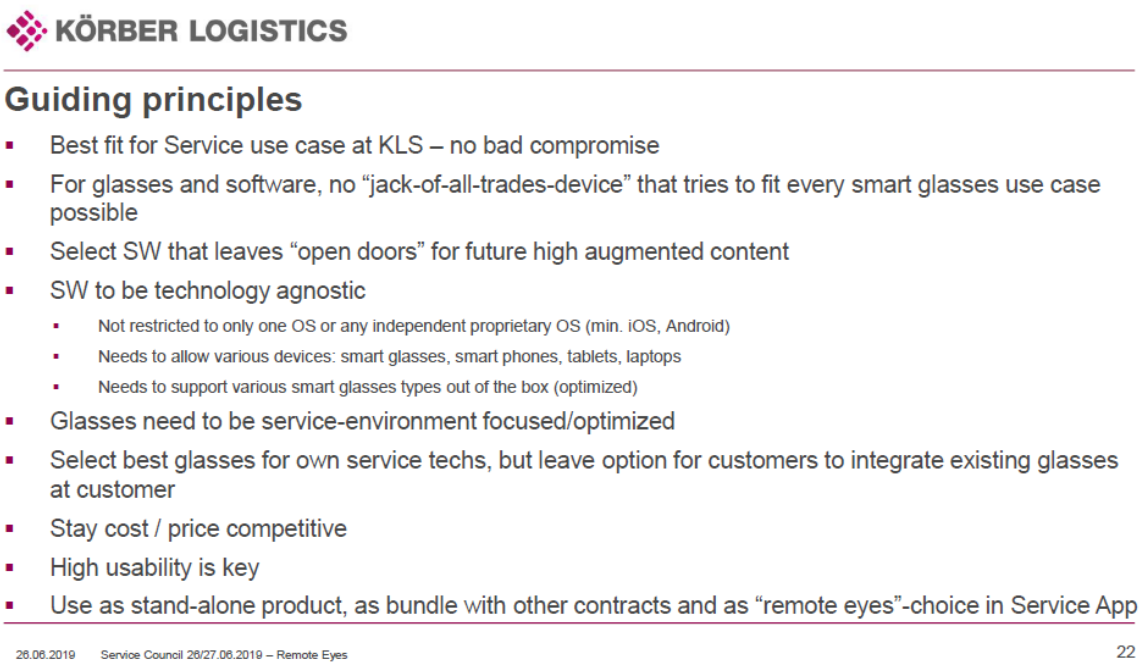


Image 6 - Guiding principles (Source: Körber internal material)

- Defining guiding principles for software and hardware requirements: at this stage it was done a list of principles that would guide the researcher through the identification of requirements. (see *Image 6 - Guiding principles (Source: Körber internal material)*
- Software/Hardware requirements: Afterwards, the requirements for software and hardware were define and assessed. That would be a main decision point considering this would guide the partner and glasses decision. For the both the types of requirements some criteria were defined as K.O., meaning that they would be the deal breaker/maker of the decision. For the software ethe K.O. Criteria were safety, video-sharing and recording, editing of photos (zoom/screen freezing and so on), the technology should be agnostic (work with different platforms and glasses), enable white-labelling, that could be integrated with KLS, that had a support and with QR Code reader. Af for the hardware, the defined K.O. Criteria were that the glasses needed to be wearable with a helmet or safety cap, the user should be able to still see the surroundings, for safety reasons, the hardware needed to be portable and should be free of obstacles (e.g.: cables).

With all the requirement criteria defined, the researcher was able to choose a partner to provide both the software and hardware fitting the criteria. The chosen partner was OCULAVIS, that provided the OCULAVIS Share platform with the necessary requirements for software and also offered a range of smart glasses. From the offered smart-glasses that were compatible with the OCULAVIS Share platform the Realwear HMT-1 was the one that fir the hardware requirements. The next step, according to the researcher and after corporate decision was to prototype the solution.

The decision went then, to which companies within Körber Group would provide the service. It was a service focused in the Körber Logistic umbrella, and the companies chosen, after the analysis of Lissy's research were Aberle, Consoveyo, Langhammer and Riantics, but Consoveyo would pilot and test the technology (see 4.2 Prototyping) and after the positive feedback of the solution, there was a corporate decision of applying the service to all the companies mentioned above.

Another potential test was made,this one by the project team and as part of this project, in the Marketing & Sales project phase. At this Potential study each HOS of the involved companies were asked to send the list of customers with a currently active hotline contract and categorize them one of four priority categories (Note that the success rate defined was and assumption made for the building of the Business Case in the Marketing & Sales project phase):

0. The Category 0 customers were customers that would not be initially approached with the solution, not suitable or do not have a history of investing in new technological solutions.
1. The Category 1 customers would be customer to be approached with a high chance of purchasing the Körber Xpert View and a success rate of 40%
2. The Category 2 customers would be customer to be approached with a medium chance of purchasing the Körber Xpert View and a success rate of 25%
3. The Category 3 customers would be customer to be approached with a low chance of purchasing the Körber Xpert View solution and a success rate of 10%

It was collected the data from 257 (two-hundred-fifty-seven) potential customers from Consoveyo, Aberle and Riantics, excluding the Category 0 customers. Langhammer did not participate because, after a corporate meeting, it was decided that the company would not participate in the first roll-out phases and would adopt the solution later. Amongst those customers, there were 49 (forty-nine) Category 1 customers, 186 (one-hundred-eighty-six) Category 2 customers and 22 (twenty-two) Category 3 customers. The analysis of the data will be presented later on, in the Marketing & Sales section of the chapter, to follow the workflow of the project.

4.2 Prototyping

Before the project started as it is, after the research made by Lissy (2019), Körber Group decided to test the solution in one of the companies: Consoveyo. That way they could assess the functionalities and test the usability and applicability of the solution in a real-world context.

The motivation for the testing of the platform came after the research made priorly at Langhammer, where it was decided who would be the partner and what smart glasses were best suited for the service. A few glasses were tested in different spectrum of the virtual/augmented/mixed reality, and then, with a decision matrix, the glasses chosen were the HMT-1 by Realwear.

The objectives set up for the pilot were understanding and assessing the service's limitations, study customer's acceptance of the solution, study staff acceptance, proof the hypothesis, and evaluate the importance of the solution. In order for that prototype to happen Consoveyo together with Körber group purchased a trial package with OCULAVIS.

With all the necessary structure to start the testing of the solution, it was time to decide and plan how to do it and what would be the phases of the prototyping. That first trial phase happened between October of 2019 and April of 2020 and it was divided in 4 stages:

- Training: The training phase happened in the beginning of the testing, in October of 2019. An OCULAVIS team went to Consoveyo's site to train the team that would be involved in the prototyping phase of the project. Some guidelines were provided by OCULAVIS and some of them were available for downloading at their and Realwear websites.
- Technical Assessments: At this phase, the technical aspects and functionalities of the software and hardware were assessed according to the needed and proposed ones (see APPENDIX E: Technology Assessments Result). For the data collection of this phase two glasses were sent to two companies, one stayed with Consoveyo's maintenance team, and a fourth pair of glasses, from a different supplier, that Consoveyo had prior to this, could be used and was sent to a third company. The HMT-1 glasses were in two companies in Portugal, one with a Resident Consoveyo Maintenance Team, one with the customer maintenance team, the other pair of glasses was send to a customer in Bulgaria to be tested with a Consoveyo resident Maintenance team, and as previously said, the fourth pair of glasses, also HMT-1, stayed at Consoveyo with the maintenance team. To document the data collected while testing both the platform and the smart-glasses a formulary was built, in that formulary questions regarding the functionalities and viability of the solution were made and the technicians would also input the reason for the usage of the solution and any difficulty or limitations they might have, how long the team took to start a call, what was the source used for the testing (web, glasses or mobile), internet source and so on (See APPENDIX C: Prototyping of Solution Formulary)
- Validation of Hypothesis: With the testing of the functionalities there was also a need for testing and proofing (or not) the hypothesis raised for the project. To test the hypothesis the study followed two steps: first was the creation of customer Journey maps (see APPENDIX D: Customer Journey Map), that is a tool to assess the possible usage scenarios of a product/service, and then with the tests of functionality and the journey map, the activity of Role Playing was also done and the hypothesis were tested and the analysis and results documented (see *Table 1 - Hypothesis Proofing* for results)

Table 1 - Hypothesis Proofing

Hypothesis	Comments
Shorter resolution times for incidents (MTTR)	**OCULAVIS Share / Mobile Application: Proved** When the field technician needs to consult the project technical documentation the pilot proved that the readably available information and ease of access can reduce the intervention time. **Smart Glasses: Not proved** The poor connectivity and difficulty with the voice commands didn't allow to prove the hypothesis

Less travel costs / travel time	**Not proved** The interventions made with the use of the glasses, either with a Consoveyo Technician Team or a Customer Technician team didn't enable to prove the hypothesis as in all cases the issue could be resolved by a phone / WhatsApp call
Optimized training (Quicker? Cheaper?)	**Proved** The OCULAVIS Application Suite allow to reduce the learning curve for few technicians and engineers
High profitability potential as we can save on travel costs and unnecessary service interventions on our site	**Proved** Scenario 1: For residence service contract there is high profitability potential, as all travel costs to site are supported by Consoveyo and not charged to the customer Scenario 2: For typical service contract the customer pays for the corrective interventions therefore the profitability obtained with the new service would reduce / cannibalize the profitability of the corrective intervention service
Better 1st time right / more efficient troubleshooting	**OCULAVIS Share / Mobile Application: Proved** When the field technician needs to consult the project technical documentation the pilot proved that the readably available information and ease of access can reduce the intervention time. **Smart Glasses: Not proved** The poor connectivity and difficulty with the voice commands didn't allow to prove the hypothesis
(High) Revenue Potential as customer would be willing to pay extra for better / premium service	High revenue potential foreseen for overseas customers with longer response times for on site interventions Local Customer might only be willing to pay a small fee extra as customer is simply expecting that suppliers “go with the times”
Consoveyo perceived as technology leaders	**Proved** by both customers and own employees that investing in industry 4.0 solutions is a differentiator

Enabler for growth (cross-company growth) as experts can help & support remotely if techs are not fully familiar with all equipment	**Proved** The OCULAVIS Application Suite allow to reduce the learning curve for few technicians and engineers

- Outcome Report: Following the Hypothesis assessments and the analysis and documentation of the data collected, the results were presented to the responsible corporate team. This presentation had the objective of deciding if Consoveyo would go through with the project or if, with the analysis results, the solution proved not to be viable. The outcome of the meeting and the corporate decision regarding the project was to not only continue but extend the solution to be offered by the companies within Körber Logistics.

This phase of the project tested the usability of the solution as well as the functionalities that the partner's software and hardware allowed. With the evaluations and analysis of the outcome and the decision to, not only go through with the project, but expanding it to the other companies within KLS, it was time to design the product.

4.3 Service Design

As mentioned in the previous chapter the primary topic for the new service development was the brainstorming and mind mapping. For that there was a merge of the of the two tools to understand what the stakeholders were and what would be their parts and connection for the service delivery and how their communication would work out. This first step was made to understand the customer experience and points of interaction, but in a very superficial way. In *Image 8 - Mind Map of Initial Encounters* it is possible to see that the interactions were defined in each of the possible portals/communication tools, and each of them was numbered as an individual encounter, with a total of 20 Use Cases, then, in *Image 7 - Mind Map of Use Cases* the connections were numbered again, this time some connection were considered to be the same scenario of use for the building of a business scenario, and the same types of encounters have the same number.

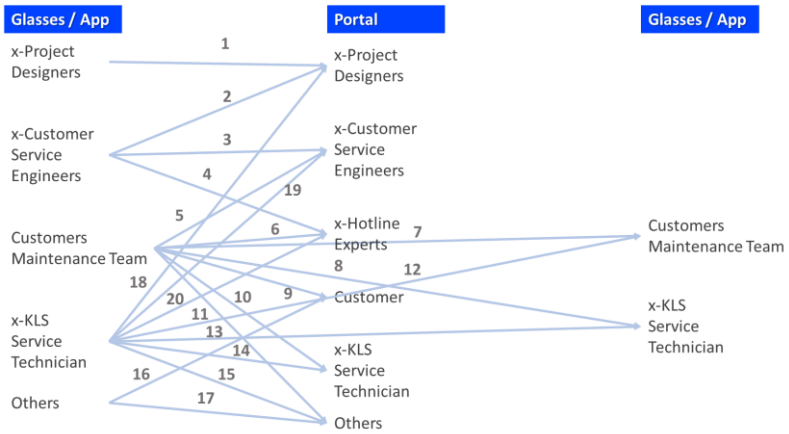


Image 8 - Mind Map of Initial Encounters

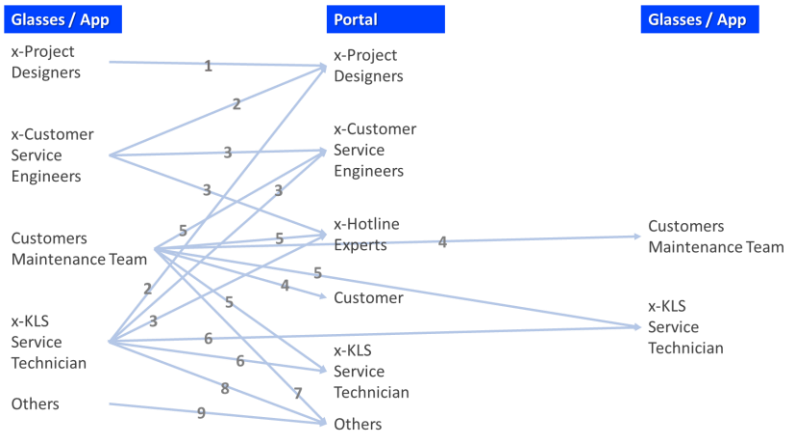


Image 7 - Mind Map of Use Cases

After the application of those two techniques, the nine connections, then, became Use Cases and for each Use Case the possible User Scenarios were defined. In total there were twenty-four possible usage scenarios amongst the nine Use Cases. It is possible to see a summary of each of the identified Use Case scenarios in the table below with a brief explanation of them (see *Table 2 - Use Case Scenarios*). Use cases are often used as a tool to provide more detail about the system even though the model does not include contextual or environmental factors, but can be used in the initial phases of a design, and it is even more used and the benefits are more evident in collaborative designs (Davis & Dawe, 2001).

Table 2 - Use Case Scenarios

UC ID	Use Case
11	A Project Designer is on the customer site and has some questions to a Project Designer of a different expertise
21	The technicians and/or CS Engineers setting up the new customer service project have a question and must call the Project Designer
31	The KLS Service Technician/CS Engineer is on site for a regular task/fixed appointment and needs support from a CS Engineer/Hotline Expert
32	The KLS Service Technician/CS Engineer is on site for emergency support and tries to reduce customer's downtime calling a CS Engineer/Hotline expert
33	The KLS Service Technician is on site and needs support from Hotline / Engineers performing maintenance or repair since this is part of his training
41	Customer uses the system for internal communication [e.g.: customer maintenance team with a team on a different site, report a problem to their superior, shop-floor management.]
51	Customer needs support at operation and calls Hotline expert
52	Customer needs a new piece and calls support team through the hotline to identify the part
53	Customer calls the hotline and they ask to use the glasses to identify the problem quicker
54	Customer needs some on site experience to have a look at something but no service technician is available
55	Customer gets emergency kit for troubleshooting
61	KLS Technician is on customer site and needs to communicate with a more expert KLS Technician
62	KLS Service Technician uses the glasses for training purposes
63	KLS Service Technicians use the App to communicate about daily business (Chat functionality)
71	The customer can use the system with others
81	The KLS Service Technician is on Site and needs some expert knowledge that we do not have within our company (e.g. SEW drives – call SEW, Knapp Shuttle – ask KNAPP)
91	[DMS] Customer contacts hotline to reduce problem solving time
92	[DMS] Customer uploads photos/videos to support the project design
93	[DMS] The KLS Team uploads manuals/guidelines to support customer maintaining operation
94	[DMS] KLS technician uploads video tutorials/manuals for the Customer to download for internal training/maintenance
95	[DMS] KLS Technician Team uploads a picture during maintenance to document any failure for other technicians/project designer
96	[DMS] Hotline Expert uploads manuals/guidelines/other documentation for the KLS Technician Team on site
97	[DMS] KLS Technician team uploads a video tutorial of a maintenance for internal training purposes
98	[DMS] KLS Technician Team Uploads documentation to prepare for a maintenance/inspection/planned action

With the identification of the Use Case Scenarios, a 6W1h analysis was done with the intent of having a deeper understanding of each one of the scenarios as well as their viability. This analysis covers all the questions, it also supports the planning of the next activities of the Körber Xpert View's development.

After all the primary Use Case Scenarios (UCS) defined, the next step was to divide the UCS into two main categories: sales and savings, sales being for the services would be offered to the customers and savings for the services offered internally for saving of internal costs. That division would make the study of the Use Cases more organized since they had different purposes and would need different planning. Then, due to a corporate decision there was a third separation, one of the sales UCS would be the main case, called the fast track (see *Image 9 - Use Case Scenarios' Categories*), this UCS would be the first one to be rolled-out and the remaining part of this project was mainly focused on it and will be explained afterwards.

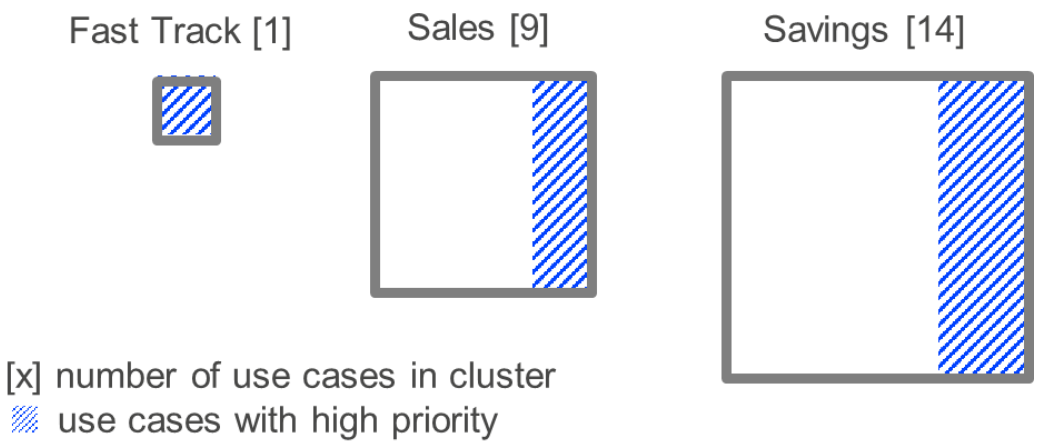


Image 9 - Use Case Scenarios' Categories

The next step of the Service Design phase was to verify the UCS, and this was done in three separate phases, the first one was the verification within the project owners with previous experiences or studies that indicated a possible viability of the UCS, the second phase was the verification and for that a couple of questions were made about the possibility of offering this Use Case as a service to the customer and if it was viable internally, to execute, and they had to classify the UCS as Not Good, Good or Priority (Prio).

- Verification HOS: The head of services all decided that the fast track scenario would be priority. This question was made because, even with the corporate decision of having this UCS to be priority number one, the insight of the HOS about the UC was important. There are a few use cases where the HOS claimed not to be applicable or had doubts about the application of it in a real-life scenario, such as some of the DMS Use Cases, but since they were not priority they were not addressed specifically after the feedback. (see *Image 10 - Use Case Scenario Verification - Head of Services*)

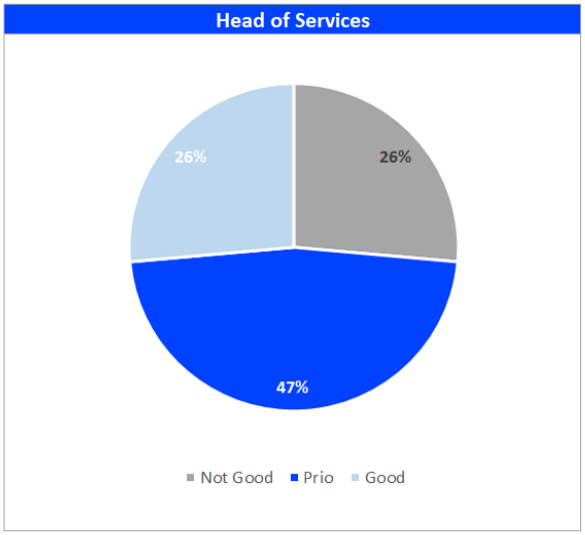


Image 10 - Use Case Scenario Verification - Head of Services

- Verification Operational team: The same verification was done with a sample of the operational team of Consoveyo, because it was a team that already understood the general application of the solution and verified some of the functions since it was the company that piloted the solution and was trained on it. The results of the verification were mostly positive and half of the questioned people classified the Fast Track UCS as a priority even though they were not informed, at this point, that this would be the first and main scenario for the solution (see *Image 11 - Use Case Scenario Verification - Operational Team*)

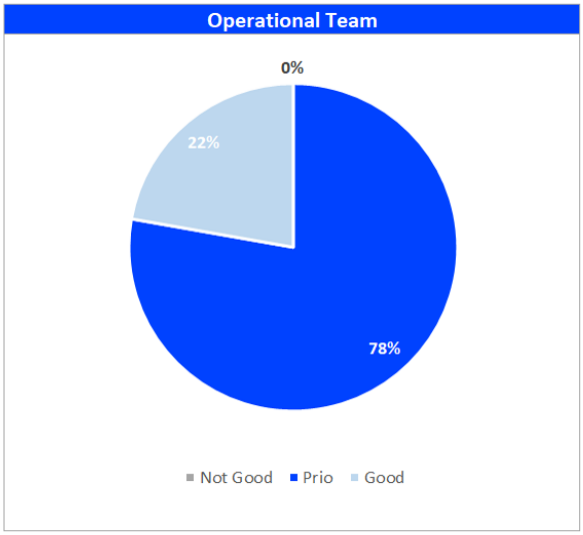


Image 11 - Use Case Scenario Verification - Operational Team

- Verification Project team: This verification was approached differently than the other ones, it was done simply with a Use Case and Technological assessments observation and with previous experiences with similar scenarios and with the initial tests made at Consoveyo, that in this report is mentioned in 3.2 Prototyping.

After the verification and classification of the UCS, according to their priorities, and with the Fast Track (FT) defined and one of the UCS (92) discarded as a UCS and defined as an add-on to the Fast Track, therefore not being a UC of its own, the next course of the project was focused on the FT UCS, because, as previously said, this was a corporate decision, mainly due to this UCS being the main service offered to the customer and was the idea that catalysed the project. The Fast Track is the main service offered because it is going to work as an add-in to the hotline service with the use of the Körber Xpert View Platform's bi-direction video-audio communication for the Körber Technician to be able to remotely identify the sources of failures in the machinery, as well as possibly solving the issue remotely, that way, reducing the identification of failure time and therefore, reducing the customer downtime. For that reason, this Use Case Scenario will be highlighted and discussed through this chapter as the main case.

Still, even with all the focus of the project being towards the FT, a service blueprint was developed for each of the UCS categorized as Sales, this tool is an operational tool that visualizes the components of a service in depth to analyse, implement, and maintain the service (Remis & Remis, 2016). This tool is commonly used to be more aware of the process of service delivery and its possible limitations. It is possible to see the Service Blueprint developed for the Fast Track in *Image 12 - Service Blueprint UC 53 (Fast Track)* and for the remaining Sales UCS the Blueprints are in APPENDIX B: Service Blueprints of Sales UCS.

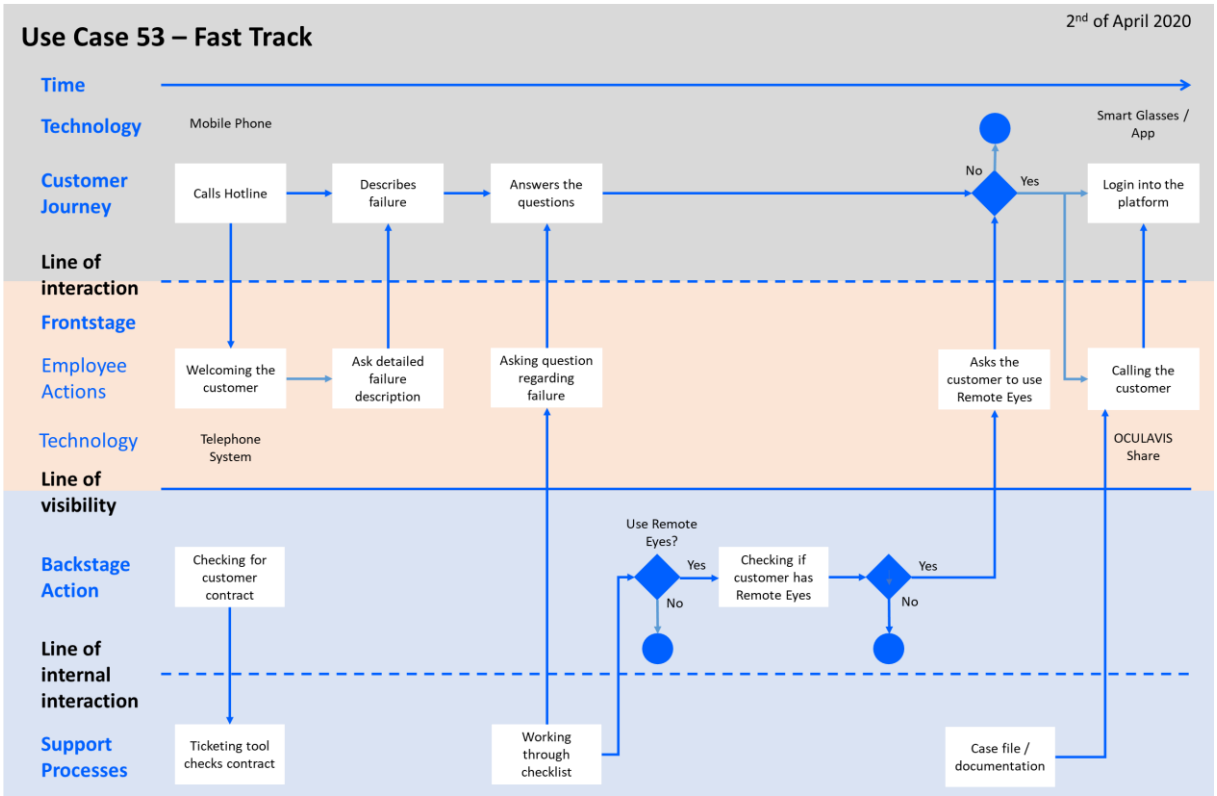


Image 12 - Service Blueprint UC 53 (Fast Track)

The service to be provided starts with the usual process the user is already accustomed to, the first thing the customer needs to do is call the hotline technician, for that the customer needs an active hotline contract, then the first contact with the customer happens, after welcoming the customer and checking the validity and conditions of the customer's contract (e.g.: due date, if the contract is 24/7 or on working hours, if the customer has a limit of off working

hours calls and so on), then the technician asks for details regarding the failure and the customer describes it, the technician then would go through a checklist that would support the decision if the solution was suitable or not, if it was, the technician would have to check if the customer has an existing contract for the service and, if the answer was positive, the technician asks the customer to use the solution and suggests changing to the platform, the final step would be the technician calling the customer and then working with the customer through the solution to identify and, if possible, solve the incident. It is important to note to things regarding this process:

1. There are no major changes in the hotline process that the customer already uses, the decision was made like this because this service is an addition to a hotline contract.
2. The idea of having a checklist to support the technician with the solution will not be applied in the first months that the service will be provided, since there is no concrete data to support that decision, therefore, the technician will be the one deciding if it usable or not with the support of their training on the platform and experience in the hotline, then the technician will fill in a brief report (see *Image 13 - Report of Solution Usage*) regarding the use of the tool to solve the incident, data way the data about the usage can be collected internally.

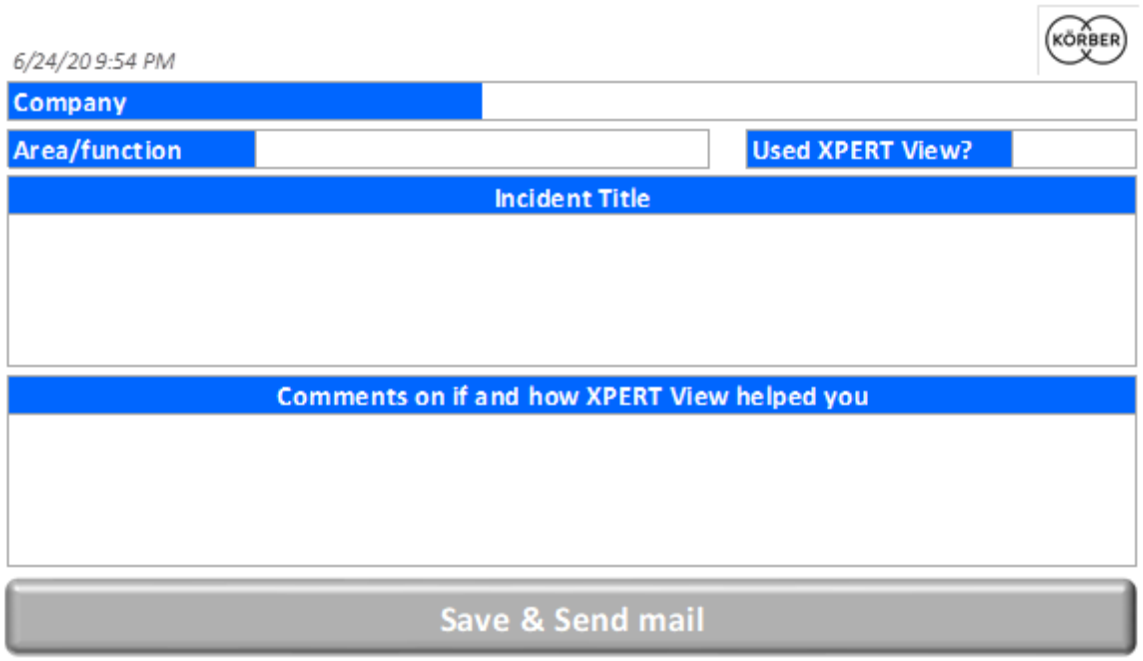


Image 13 - Report of Solution Usage

After developing the Service Blueprint, it was possible to not only capture the customers' experience but also providing enough operational detail to document how that service is delivered (Remis & Remis, 2016). After building the blueprint, the next step was to work on the Value Proposition of the service. A value proposition is, as defined by Osterwalder et al. (20015), the description of the benefits the customers can expect from the product or service offered, therefore it is key to understand and know what are the values that the customers are paying for. The tool used for that development was the Value Proposition Canvas, where there is a study of pains, gains, and offerings/activities from both the side of the customer and the side of the service provider (see *Image 14 - Value Proposition Canvas*). From the side of

the customer there is clarification of the customer understanding and for the provider it is a description of the intended creation of value (Osterwalder et al., 2015).

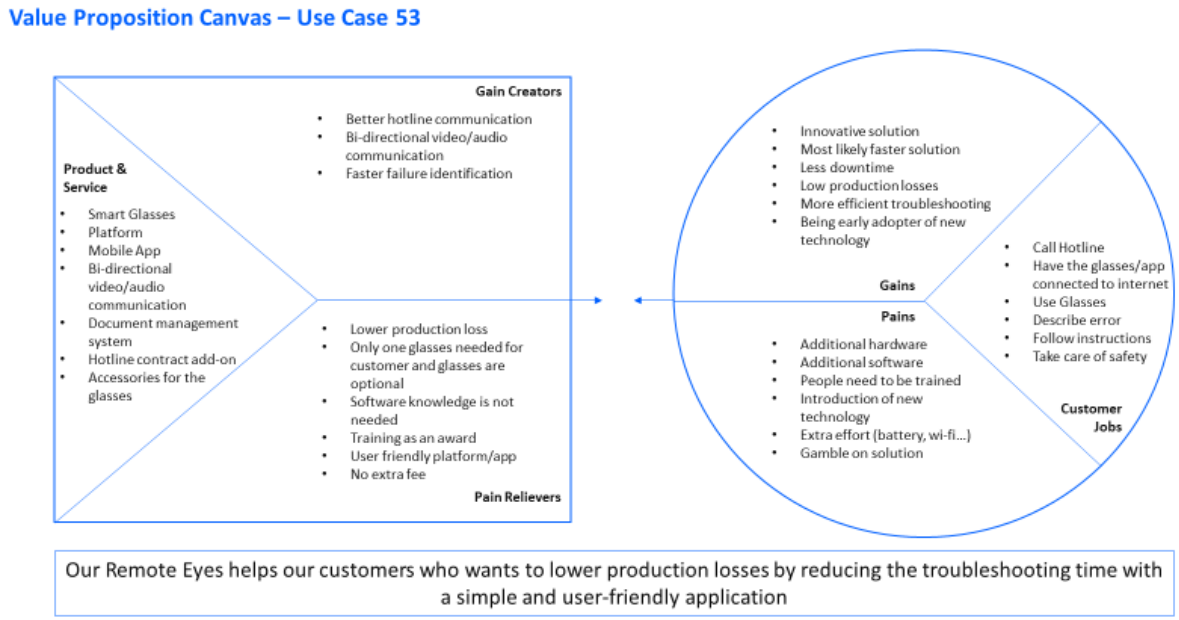


Image 14 - Value Proposition Canvas

The first side to be filled was the customers' side. It starts with the customer jobs, in that part it is filled in what are the customers activities, and in the case of the UCS 53 the customer has to be the one contacting the hotline, he must have the application and/or smart glasses, ha has to use the glasses, to describe the error, follow the instruction given by the technician and will e the one responsible for safety. After defining the jobs there must be defined the Pains & Gains of the customer, that are the negative and positive states for the customer, with the service. For the pains it was addressed the fact that there is going to be additional hardware and software and with that additional effort and training will be necessary.

For the second half of the canvas, there is the provider's side, where it showcases the Product and/or service provided, what within this product/service creates gains and what relieves the customers' pains. For the service to be provided it was listed the smart glasses, the software, some of the main features of this software, the add-on to a hotline contract and the accessories that will come with the purchasing of the glasses. The main gain creators were the improvement in communication, with the addition of an extra channel with different functionalities that will allow a faster identification of failures. For the Pain relievers it was pointed out the reduction of production loos with the reduction of the downtime (caused by the faster identification of the failures), the customer does not need to purchase the smart glasses, they can use the platform that is user-friendly and easy to use, there will be no extra fees after the customer closes the contract and finally the additional knowledge on a new technology, for which the customer will receive training for.

With both sides of the Value Proposition Canvas filled in, the Value Proposition (VP) could be built. For the construction of the Value Proposition all the benefits delivered through loyalty rewards, priority-tiered services, customization, and personalization for the customer should be included (Locklove & Wirtz, 2011). With that understanding and the Canvas, the value proposition was developed as a single, simple phrase that had the main features and

value offered by the service (previously called Remote Eyes). And the updated:value proposition is:

> *"Our Körber Xpert View solution helps our customers who wants to lower production loses by reducing the troubleshooting time with a simple and user-friendly application"*

After defining the Value Proposition it was time to define which Business Model would be the apporpriate one to sell Körber Xpert View to the customers. For that there as a analysis of each one of the 55 Business Models by Gassmann et al. (2014) and start narrowing down the best fits for the UCS 53 (Fast Track), first it was narrowed to 22, then to 5 and finally to the top three fit, after a deeper search on the three, one was chosen as the main Business Model and sent out to the HOS for them to evaluate, the feedback was then collected and the chosen Business Model was the Flat Rate. The Flat Rate model is a fixed fee the customer pays in a fixed period of time regardless of the usage (Gassmann et al., 2014). For the Körber Xpert View solution, the customer will pay a monthly fee, using the solution or not, the feedback from all the HOS was that the Business Model was a fit and should be prioritized.

With the defined Value Proposition, it was time to move to the Business Model Canvas (BMC). The business model's purpose is to describe how a company creates, delivers, and captures value (Osterwalder & Pigneur, 2013). The BMC was built for the service to be an initial understanding of all the blocks and therefore all the components of it, and later validated with the Head of Services. The BMC is composed by nine blocks and each block is interconnected in a way to overview the main features of the service in order for the canvas to fulfil its purpose. (see *Image 15 - Business Model Canvas UC 53 (Fast Track)*)

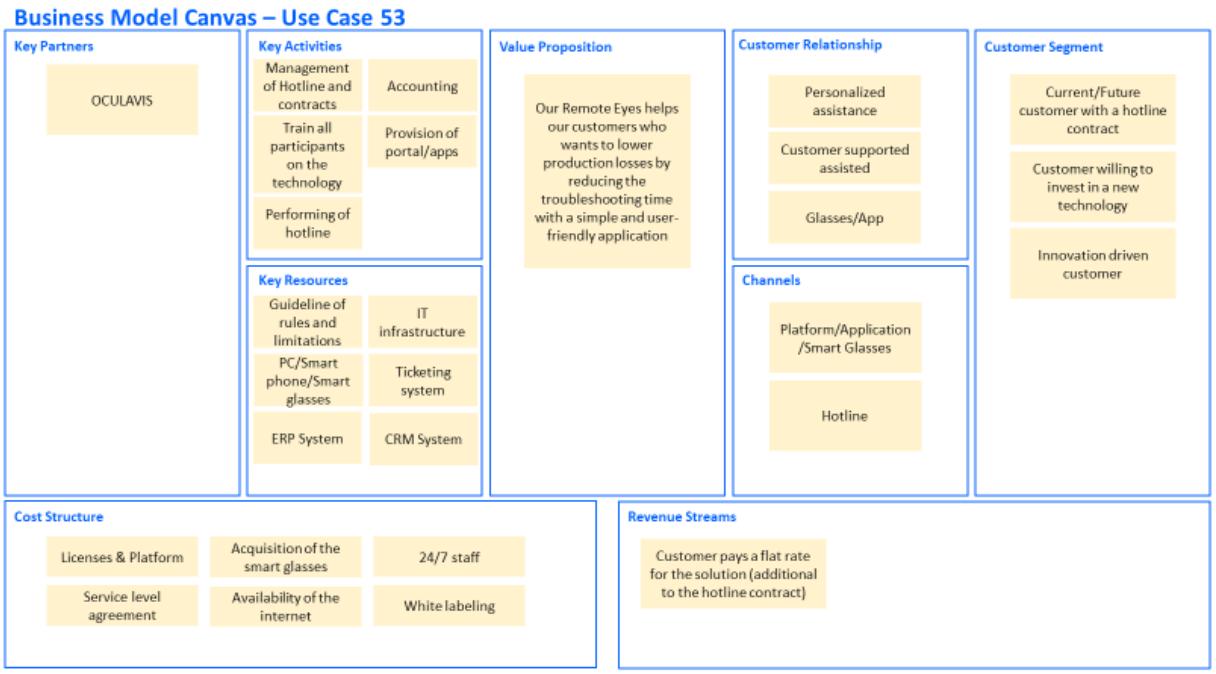


Image 15 - Business Model Canvas UC 53 (Fast Track)

To fill in the first half of the BMC one must work in the external part, that are the customer segments, value proposition, customer relationship and delivery channels. The first step was identifying the customer segments, and for the project three segments were initially identified, but the sticker-note's color remained the same because all those characteristics were from the

same segment of customers, therefore, the Value Proposition was only one, the one previously developed with the support of the Value Proposition Canvas tool, afterwards, it was necessary to define how this value would be delivered and what is the customer relationship that is going to be created with the service. The distribution channel will be the Körber Xpert View platform/application and the service will create a relationship by providing a personalized service with a customer supported assistance using the glasses/application. The delivery of the value generates a revenue, and in the case of the solution, it will be a Flat Rate Business Model working as an addition to the Hotline contract.

The second half of the BMC is all about the structure needed to provide the service and deliver the value to the customer, and it has the Key activities, resources and partners as well as the cost structure. The key activities to be performed are:

- Management of hotline contracts: since the solution will be an addition to the hotline contract, there must be an extensive management of those.
- Train all participants on the technology: with the addition of a new software and hardware all staff needs to be trained in the technology, on how it works and how to sell it.
- Performing of hotline: as previously mentioned this will be an add-on to the hotline contract, therefore the hotline staff must provide the service
- Accounting: even though it is an addition to a already provided service, the Körber Xpert View solution will be provided through an individual contract, therefore one of the key activities will be accounting
- Provision of portal/app: In order for the service to be provided the platform, being the app or the portal, must always be available, so maintaining it is key.

With the definition of the key activities the Key resources, that are the necessary resources to perform those activities, were define as the Guideline and Rules of limitations, as part of the training of the employees, PC/Smartphone/Smart Glasses to access the platform, ERP System, an IT infrastructure, a ticketing system and a CRM system. The partners on providing the service are OCULAVIS, that is the company responsible for providing the software and hardware for Körber. As for the cost structure, in a summarized way, it is the payment of the platform and licenses, the acquisition of the glasses, the service level agreement and the availability of internet and 24/7 staff and the white labeling of the platform.

This BMC provided an overview of all the necessary knowledge of the main features of the service, and, as previously said, was validated with the HOS of all the companies that will provide the service. With the understanding of the aspects of the service, it was time to go to the next phase, Prototyping.

The following activity, after defined the Business structure, was to adapt the offered platform to the needs of the project. The platform that was being used until this point was the trial platform provided by OCULAVIS, but with the approval of the project a new platform had to be developed a few changes were necessary. To do that, first all the authorizations for users were assessed and an activity of Role Playing was performed in each of the roles that were necessary to provide the service, that way all it was possible to define what roles would be needed and what authorization those roles needed to have. The roles were defined as:

- Admin: The admin is someone that does not actively uses the platform but has al the authorizations and can do any urgent changes necessary.

- Hotline Team Leader: The Hotline team leader would be responsible for the hotline technicians and can add customers to the platform and manage, with certain limitations, the projects, and cases.
- Hotline technician: The hotline technician has the access that is necessary for them to call the customers and provide the service, such as calling, managing, and creating cases.
- Back Office: The Back-Office role is to the people that will be responsible for adding and editing users to the platform, being internal users or external ones (customers).
- Field Technicians/CS Engineers: This role has the same access of the Hotline Technician with the twist that instead of managing and creating cases they will manage and create projects in the platform.
- Product Managers: The product managers will be the Project managers, responsible for creating and managing projects, products, and components in the platform.

With all the roles defined as well as what each of the roles would have to do, the next step was managing the platform structure and do the necessary changes, first thing was requesting the new roles to be created, since the accesses were defined by OCULAVIS as a default set of roles. Next step was the changes in some terms to match the Körber language. All those requests were sent to the team responsible for the purchasing and negotiation of the new platform to be developed by OCULAVIS.

4.4 Marketing & Sales

The following phase had the objective of defining marketing and sales strategy and activities and with the application of the methodology (see 3.4 Marketing & Sales) the technique of the Marketing 4Ps covered the efforts for this phase. The goal of this phase, besides having the Marketing 4Ps ready, was to have a finished Business Case.

The first activity was defining a price strategy, the pricing approach initially chosen was the Value-Based Approach, that is an approach where the values offered to the customer are quantified. The fist activity of this step was Capturing the values offered to the customer, those values would be the main argumentation for selling the Körber Xpert View solution to the customers, those values are:

- Improved communication ➔ reduced time to failure identification ➔ reduce downtime ➔ reduce production loss ➔ **saving money**
- Being an early adopter of a new technology ➔ being attractive to possible new employees ➔ **increase quality level of employees**
- Being an early adopter of a new technology ➔ support current employees in daily business ➔ **increase employee satisfaction**
- Improved communication ➔ less failures stay unidentified ➔ no need to send a service technician ➔ **saving travel expenses**
- Hotline add-on ➔ 24/7/365 availability ➔ additional bi-directional video/audio communication ➔ **increased perception of security**
- Adoption of an innovative solution ➔ extension of a high-quality service ➔ **increased perception of hotline quality**

To the next activity was adding actual value to the values captured. For each one of the values some KPIs was separated and researches were made to find the values (see *Table 3 - Value Capture Planning*). The research was done both internal and external, to look for experience inside of Körber Group but also experiences with companies that were providing similar services, also theorical studies that were previously done about the subjects of study.

Table 3 - Value Capture Planning

VALUE CAPTURES		
How much do we save on a hotline call		
How many % do I save using the system during a hotline call	x	Average duration of a hotline call
Total number of cases		
For Value: need to find out how much an hour of production loss is worth (x reduction) (x hotline calls per year)		
Increase quality level of employees?		
What type of employee is interested in working with nes technology?		
Are them interesting to our customers ?		
For value: How much does it cost for the company to find the same people with HR measures		
Increase employee satisfaction		
% of Satisfaction of employees		
How many % of employees are positively affected by a new technology		
For value: How much better happy employees work compared to not happy employees		
Saving travel expenses		
How many % of cases a field service technician needs to be send out		
How much of that can be saved by using the remote eyes?		
What is the average cost of sending a S Technician to a customer		
Total number of cases		
For Value: Multiplie all above		
Increased perception of security		
Hard/Impossible to measure. Björn: +2,5% will be added to final sales price		
Increased perception of hotline quality		
Hard/Impossible to measure. Björn: +2,5% will be added to final sales price		

The results of the research were documented and took place during a period of three to four weeks, but, even with an extensive work for researching the values, some of them were not possible to have a concrete value from reliable sources (see APPENDIX F: Adding Value to Value Captures – Research Documentation). For that reason, the Value-Based Approach was discarded.

Decided the first attempt of pricing approach was not suitable a Cost-Plus-Pricing approach was developed taking, also, into consideration a few characteristics of the customer to customize the pricing. The costs were defined, and the values were structured in CAPEX and OPEX. The Structure and the initial calculation of the Cost-plus-Pricing is presented below, but the values remained confidential. For the calculation the amount of each one of the factors were defined, then it was calculated the costs per piece of the factors multiplying with the share of costs (corporate decision of assumed value), defined and overhead and markup (corporate decision of assumed value), then the calculation of pricing was done by multiplying the Quantity, Cost per piece, overhead and Markup (see *Image 16 - Cost-plus-pricing calculation*). The pricing was divided in two categories, CAPEX and OPEX. CAPEX are the initial costs of set up and hardware while the OPEX are the costs of the service offering (operational costs).

				X%	Y%			Z%	
		Amount	Cost Price (per piece)	Overhead	Mark-up	Cost + pricing	Costs	Share of costs	Comments & Assumptions
CAPEX	HMT-1 Smart Glasses	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	
CAPEX	Helmet - Bump Cap	4	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	
CAPEX	Hard Case	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	
CAPEX	Initial training	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	
CAPEX	Installation	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	
CAPEX	Set-up of users	5	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	10 min set-up per user
CAPEX	Set-up of teams	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	30 min set-up per team
OPEX	Liscenses	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	Z%	
OPEX	Service Fee	10%	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	Z%	
OPEX	White Labeling	10%	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	Z%	
OPEX	Administrative Costs per User	5	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	30 min
OPEX	Internal training efforts	1	CPP Value	X%	Y%	Amount * CPP Value * Overhead * Mark-up	Amount * CPP Value	100%	90 min

CAPEX	Sum of CAPEX Cost + pricing	Sum of CAPEX Cost
OPEX	Sum of OPEX Cost + pricing	Sum of OPEX Cost

Image 16 - Cost-plus-pricing calculation

The next step was the customization of the pricing, for this a few of variables were defined. Those variables are:

- Size of customer warehouse: This factor was based on the customer's warehouse project, in euros. The data from all the customers with active hotline contracts were gathered, with information of the project size (€) and divided in five categories, each category had the same volume in euros, and with that a factor was decided for each one of the categories, from extra-small to extra-large, with small being the default category.
- Customer Location: Since the companies are located in different countries and also have customers worldwide, the decision was to create a factor for each country that the solution would be offered. For now, the solution will only be provided within Europe. For the Calculation of the factor the value used was the Gross Domestic Product per Capita of the countries (GDP). GDP is a measure of a country's economic output taking into account the number of people, dividing the Gross Domestic Product by the population number. The value used as a basis for the calculation was Germany's and then the factors were found to be multiplied by the cost-plus-pricing to have a final customized value.
- Package (Hardware): This variable addresses the quantity of glasses and users a company will purchase. The defined standard package is composed by one unit of the HMT-1 Smart Glasses (with a helmet or Bump Cap), five users, four Helmet or Bump Cap Kit (one for each user), one hard case and one company account. The customer can, even with the pre-defined standard package, choose from a few options the quantity of the glasses and users.

After defining the pricing strategy and what would be the variables for the customization of the price, a tool called Price Calculator was built. It is a simple Excel that takes in consideration all the factors and calculates the value according to the customer. It is a tool to be used by the Sales Staff to negotiate with the customer (see *Image 17 - Price Calculator*), this calculator shows the initial price, connected to the CAPEX costs and the recurring price, connected to the OPEX, showing the customer annual price, that would be divided monthly to fit the Flat Rate business model chosen in the previous phase.

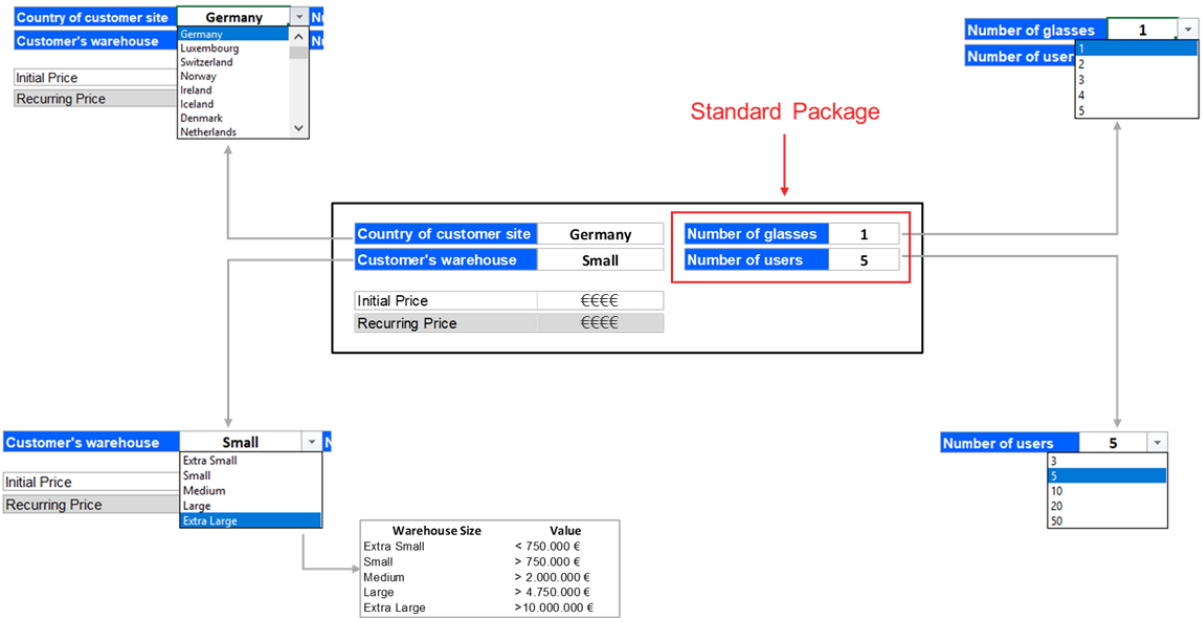


Image 17 - Price Calculator

The next activity was creating the training material for both the technicians, engineers, and product managers that would use the platform and sales staff the would be responsible for offering the solution to the customer. To prepare the training for the operational staff it was necessary to create a script of a made up scenario, since the training would have to be done remotely due to COVID-19, which was a good way of testing and training the staff in the platform. The script (see APPENDIX G: Script for training in the platform – Technician) told a story of choosing in between two drinks, and the scenario and question made by the customer (the person training the staff) would allow the technicians in training to use all the functionalities that the platform offers during a video-call.

Using the script, a video-training was also recorded following the steps and explaining what the problem was, how the platform worked and how to use its functionalities to support the identification a failure. Another material was a document with Rules of Usage for staff (see APPENDIX H: Rules of Usage (Internal), with what they could and could not do with the platform, glasses and application, as well as the guidelines that was provided by OCULAVIS and downloaded from the Realwear website (for the smart-glasses). After the training was performed a Training Kit with all the material previously mentioned was sent to each participant, and the majority of the material offered are available in three languages: English, German and Portuguese (the material available only in English is the cleaning guideline and the battery hot-swap).

The other training necessary was to the Back-Office team, that need to understand the platform and what are the steps to creating a team, internal users, and external users. The teams are a structure where the users will be inserted, the user can only contact people that are in the same team as them and the structure of teams goes from a Körber Team, to the Company team, to the department team, to the customer team. The training was done in a PowerPoint file with screenshots and detailed explanations with a step-by-step guideline on how to create teams and users with an explanation on why things were made like this. The training is done with a call explaining the participants how to create users and going through the process and the material created is distributed to each of the participants, afterward.

The material to train the Sales Staff was made in a PowerPoint file and it was composed by the following topics:

- System: A quick explanation on how the system works and what the solution goal is.
- Storyline: In this part an image was created to have a visual explanation of what the Use Case Scenario offered (Fast Track) was, this image has also a brief explanation of the main steps of the service delivery (see *Image 18 - Service Storyline*), that way the Sales staff would have a global understanding of the service offered.

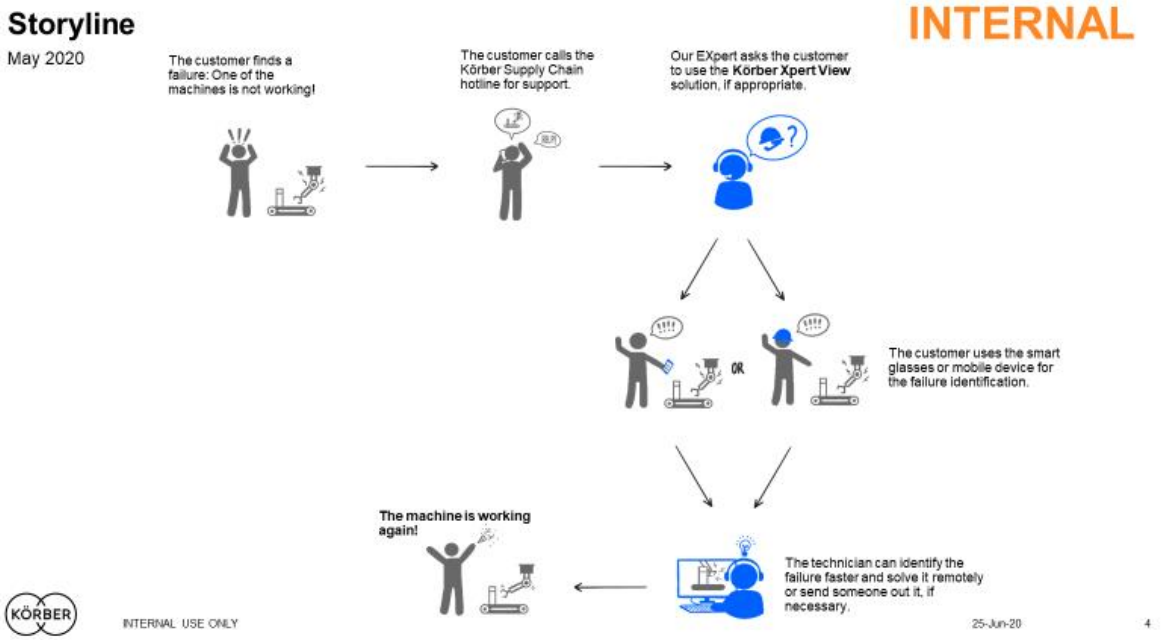


Image 18 - Service Storyline

- Functionalities: Even though the sales staff is not going to actively use the platform it is important for the argumentation while selling that they understand what are the main functionalities offered by the system and how this functionalities support the quicker identification of the failures, so a guideline with pictures of the platform was inserted into the training.
- Main Advantages: Here it is presented to the staff a small list of what are the main advantages of Körber Xpert View.
- Sales Argumentation: This is a critical part, even though further on there is a F.A.Q., in the Sales argumentation there is the use of the values captured in the previous phase of the project as sales arguments, and for each of them a role-playing activity was done with two people, one playing a customer questioning each of the arguments and the other one as the Salesperson answering those questions. Those are key questions to the advantages and main values offered by the solution to the customer (see APPENDIX I: Sales Argumentation).
- Pricing: The pricing structure was presented for the Sales Staff to understand what the pricing approach and how to use pricing calculator (see *Image 16 - Cost-plus-pricing calculation*).

- Dos & Don'ts (internal): A quick review of the internal Rules of usage are in the presentation so the Salesperson does not use this as an argument for selling Körber Xpert View.
- User technical requirements: The technical requirements and aspects for using the solution are also inserted in the presentation.
- F.A.Q.: An F.A.Q. was created with the possible questions, so the salesperson can be prepared for the possible questions that might emerge.

To support the sales activities the marketing activities and approaches had to be defined. It was necessary to provide the marketing team with content to understand the Körber Xpert View Solution, its values, its offers an decide on which would be the approach and what channels would be chosen to deliver the marketing material. An Elevator Pitch presentation was created with the main points of the sales presentation and the solution was presented during meetings that initiated a brainstorming of ideas of where and how the solution should be marketed. The decision on the Marketing activities and approach was responsibility of the Marketing team, therefore, the project team provided all the material that the marketing team needed to do so and due to a corporate decision the marketing activities would only take place in July/2020.

With full understanding of delivery channel of service, pricing, marketing and what the product is and offers, all the information was inserted in a Marketing 4Ps structure, that way it is possible to overview the main outcomes of this phase with the support of the other phases. (see *Image 19 - Marketing Mix of Körber Xpert View*)

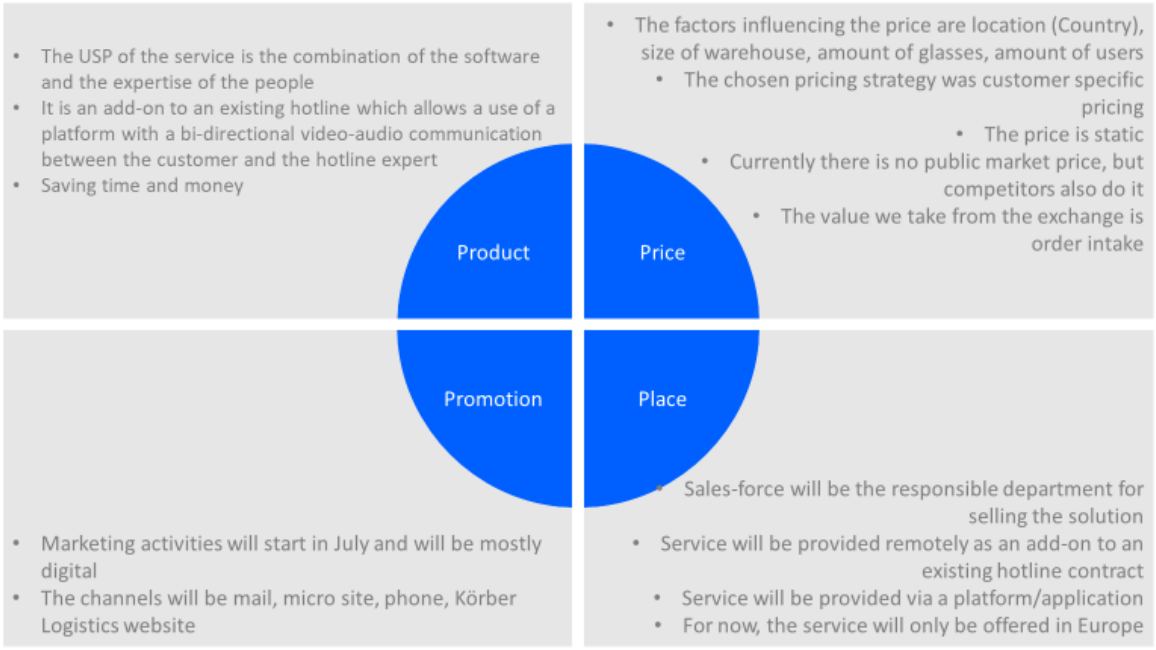


Image 19 - Marketing Mix of Körber Xpert View

As said in the beginning of this subchapter, the activities performed would not only define the Sales and Marketing strategies but also offer data to create a Business Case Analysis. As seen in the Potential phase, one of the analysis made was getting the list of customers and add their success rate, after this was done, the price for each customer was calculated using all the pricing variables and then those prices were multiplied with the success rate and the potential initial price and potential recurring price were found, another calculation made, this one to add to the Business Case, was summing up all the successes rates of the customer to calculate how many contracts for Körber Xpert View the company would have until 2024, this calculation is with an assumed value validated in a corporate level. The other tools used were the cost-plus-pricing calculator and other operational costs of the project.

The data gathered and analyzed were then added to an Excel provided by Körber to build the Business Case, this excel did a profitability analysis and showcased the Revenue, The Contribution Margin and calculated, also, the Payback time. The purpose was to analyze, again, the viability of the project, but this time, the financial viability. The values defined as ideal for the project were a Payback of less than three years, a Contribution margin superior or equal to 30% and an internal rate of return superior or equal to 20%, and having all the values positive would indicate that the project was financially viable for the company. The image bellow (see *Image 20 - Overview House of Business Case*) shows that the project had all three values for Körber Xpert View came out to be positive (the values were not showcased to maintain confidentiality), meaning that the project would be a good investment for Körber Group.

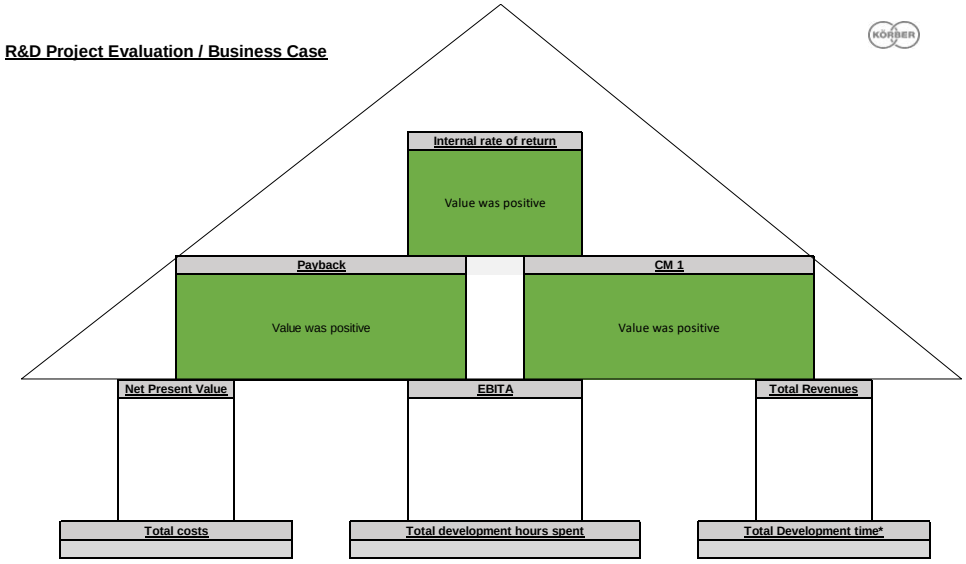


Image 20 - Overview House of Business Case

5 Conclusion and Future Prospects

This project aimed to design a new Service and analyse the collected data and outcomes of the design process to calculate the viability of the service. Following the methodology defined in Chapter 3 Methodology, the project followed a series of activities to create a viable service for Körber Group, assessing the Industry 4.0 potential and the customer need for an improved remote service that would reduce the machine downtime and related operation costs. The appearance of theCOVID-19 spread during the project development phase, further increased the need for this type of remote services.

The goal of creating a Competitive Advantage is still to be proven, since the service did not reach the Roll-out phase, therefore, the customer does not have an increased perception of service quality yet. But the competitive advantage prospects are good, the company has a strong remote maintenance service and the Körber Xpert View Solution will bring a new dimension to it by adding an additional channel of communication – assisted reality - to further support the end customer.

The applied methodology proved to be effective in creating a viable service that has good financial prospects. The studies about service design and the increasing research about the topic is bringing more tools and techniques and models for the development process, it is not a recipe from a book to be followed, but with the combination of the correct tools it is possible to have a very positive outcome.

The next step for the Körber Xpert View Project is the Roll-out phase and the marketing activities. The first two customers to pilot the solution are in the wait for the finishing touches of the contract. The solution will start with the offering of the Fast Track use case and will have the addition of the other UCS in the future.

As a master student fully involved in the project's main phases, I had the experience to study and apply tools seen in a classroom and see what value does it really take to the service that was provided. This was an unique opportunity to understand the behaviour of the service market, to apply various service design tools and to see an abstract concept of a service becoming a go-to-market ready service being sold to the customers.

References

B. Chen, J. Wan, L. Shu, P. Li, M. Mukherjee and B. Yin, "Smart Factory of Industry 4.0: Key Technologies, Application Case, and Challenges," in IEEE Access, vol. 6, pp. 6505-6519, 2018, doi: 10.1109/ACCESS.2017.2783682.

Baines, T., Lightfoot, H., Benedettini, O., & Kay, J. (2009). The servitization of manufacturing. Journal of Manufacturing Technology Management, 20(5), 547-567. https://doi.org/10.1108/17410380910960984

Berry, L. & Shankar, V. & Parish, J. & Cadwallader, S. & Dotzel, T. (2006). Creating New Markets Through Service. MIT Sloan Management Review. 47.

Böhmann, T., Leimeister, J. M., & Möslein, K. (2014). Service systems engineering. Business & Information Systems Engineering, 6(2), 73-79. https://doi.org/10.1007/s12599-014-0314-8

Borden, N. H. (1965). The concept of the marketing mix. In Schwartz, G. (Ed), Science in marketing. New York: John Wiley & Sons, 386-397

Cantalanotto, D. A Tiny History of Service Design. Blurb, Incorporated, 2018. Available at: https://service-design.co/book-a-tiny-history-of-service-design-368ed603797c

Charmaz, K. (2008). Constructionism and the Grounded Theory Method. In J. A. Holstein & J. F. Gubrium (Eds), Handbook of Constructionism Research (pp. 397-412). New York: The Guilford Press. http://www.sxf.uevora.pt/wp-content/uploads/2013/03/Charmaz_2008-a.pdf

Chung, S., Won, D., Baeg, S., & Park, S. (2009). Service-oriented reverse reengineering: 5W1H model-driven re-documentation and candidate services identification. 2009 IEEE International Conference on Service-Oriented Computing and Applications (SOCA). https://doi.org/10.1109/soca.2009.5410445

Clapper, T. (2010). Role Play and Simulation: Returning to Teaching for Understanding. Education Digest: Essential Readings Condensed for Quick Review. Available at: https://www.researchgate.net/publication/234567370_Role_Play_and_Simulation_Returning_to_Teaching_for_Understanding

Coes, B. (2014). Critically Assessing the Strengths and Limitations of the Business Model Canvas [Master's thesis].

Coronavirus' impact on service organizations: Weathering the storm. (2020). McKinsey & Company. https://www.mckinsey.com/business-functions/operations/our-insights/coronavirus-impact-on-service-organizations-weathering-the-storm#

Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.). SAGE. https://www.researchgate.net/publication/31763471_Research_Design_Qualitative_Quantitative_and_Mixed_Methods_Approaches_JW_Creswell

Creswell, J. W., & Poth, C. N. (2017). Designing a Qualitative Study. In Creswell, J. W., & Poth, C. N (Eds). Qualitative inquiry and research design (International student edition): Choosing among five approaches (3rd ed.). (pp. 42-68). SAGE Publications. https://www.sagepub.com/sites/default/files/upm-binaries/46924_CH_3.pdf

Davis, L., & Dawe, M. (2001). Collaborative design with Use Case scenarios. Proceedings of the first ACM/IEEE-CS joint conference on Digital libraries - JCDL '01. https://doi.org/10.1145/379437.379472

Davis, L., & Dawe, M. (2001). Collaborative design with use case scenarios. Proceedings of the first ACM/IEEE-CS joint conference on Digital libraries - JCDL '01. https://doi.org/10.1145/379437.379472

De Lille, C., Debark, J., & Maldonado, M. P. (2015). Weight, Safety and/or services? An Aviation Manufacturer Tackling Challenges of Servitization through Design. Conference: Spring Servitization Conference 2015. At: Birmingham, UK. Available at: https://publications.aston.ac.uk/id/eprint/25755/2/Proceedings_of_the_Spring_Servitization_Conference_SSC2015.pdf

Felix, O. C., Terungwa, C. S., Raman, A. O. (2012) Vol. 3, p.30 Making Slogans and Unique Selling Propositions (USP) Beneficial to Advertisers and the Consumers http://www.iiste.org/Journals/index.php/NMMC/article/viewFile/1772/1725

Garg, A., & Deshmukh, S. (2006). Maintenance management: Literature review and directions. Journal of Quality in Maintenance Engineering, 12(3), 205-238. https://doi.org/10.1108/13552510610685075

Gassmann, O., Frankenberger, K., & Csik, M. (2014). The business model navigator: 55 models that will revolutionise your business. Pearson UK.

Gibbons, J., & Hazy, J. K. (2017). Leading a large-scale distributed social enterprise. Nonprofit Management and Leadership, 27(3), 299-316. https://doi.org/10.1002/nml.21253

Gibbons, S. (2017). Service Blueprints: Definition. Available at https://www.nngroup.com/articles/service-blueprints-definition/

Goi, C. L. (2009). A review of marketing mix: 4Ps or more? International Journal of Marketing Studies, 1(1). https://doi.org/10.5539/ijms.v1n1p2

Guenzi, P., & Troilo, G. (2007). The joint contribution of marketing and sales to the creation of superior customer value. Journal of Business Research, 60(2), 98-107. https://doi.org/10.1016/j.jbusres.2006.10.007

Hidayanti, W. I., Rochintaniawati, D., & Agustin, R. R. (2018). The effect of brainstorming on students' creative thinking skill in learning nutrition. Journal of Science Learning, 1(2), 44. https://doi.org/10.17509/jsl.v1i2.8738

Houde, S., & Hill, C. (1997). What do prototypes prototype? Handbook of Human-Computer Interaction, 2, 367-381. https://doi.org/10.1016/b978-044481862-1.50082-0

Kinnunen, R. E., & Turunen, T. (2012). Identifying servitization capabilities of manufacturers: A conceptual model. Journal of Applied Management and Entrepreneurship, 17(3), 55

Lasi, H & Fettke, P & Feld, T. & Hoffmann, M. (2014) "Industry 4.0," Business & Information Systems Engineering: Vol. 6: Iss. 4, 239-242. Available at: https://aisel.aisnet.org/bise/vol6/iss4/

Lee, J. & Bagheri, B. & Kao, H. (2014). A Cyber-Physical Systems architecture for Industry 4.0-based manufacturing systems. SME Manufacturing Letters. 3.

10.1016/j.mfglet.2014.12.001.https://www.researchgate.net/publication/269709304_A_Cyber-Physical_Systems_architecture_for_Industry_40-based_manufacturing_systems

Lima, L. (2019). The SDCS method: a new service design method for companies undergoing a servitisation process [Master's thesis].

Lovelock, C. H., & Wirtz, J. (2011). Services marketing (7th ed.). Prentice Hall.

Lovelock, C., & Patterson, P. (2015). Services marketing. Pearson Australia.

Lynn Shostack, G. (1982), "How to Design a Service", European Journal of Marketing, Vol. 16 No. 1, pp. 49-63. https://doi.org/10.1108/EUM0000000004799

Martín-Peña, M.L. and A.Z. Bigdeli, Servitization: academic research and business practice. Universia Business Review, 2016(49): p. 18-31

Masoni, R., Ferrise, F., Bordegoni, M., Gattullo, M., Uva, A. E., Fiorentino, M., Carrabba, E., & Di Donato, M. (2017). Supporting remote maintenance in industry 4.0 through augmented reality. Procedia Manufacturing, 11, 1296-1302. https://doi.org/10.1016/j.promfg.2017.07.257

Mathieu, V. (2001). Service strategies within the manufacturing sector: Benefits, costs and partnership. International Journal of Service Industry Management, 12(5), 451-475. https://doi.org/10.1108/eum0000000006093

Matthyssens, P., & Johnston, W. J. (2006). Marketing and sales: Optimization of a neglected relationship. Journal of Business & Industrial Marketing, 21(6), 338-345. https://doi.org/10.1108/08858620610690100

Meier, H., & Völker, O. (n.d.). Industrial product-service-Systems - Typology of service supply chain for IPS2 providing. Manufacturing Systems and Technologies for the New Frontier, 485-488. https://doi.org/10.1007/978-1-84800-267-8_100

Melao, N. (2015). SERVICE SCIENCE. The SAGE Encyclopedia of Quality and the Service Economy (1st ed.). SAGE. 720-729. https://doi.org/10.4135/9781483346366.n201

Nagyova, A., Pacaiova, H., & Palko, M. (2015, June). Analysis and Identification of Nonconforming Products by 5W2H Method. 9th International Quality Conference, University of Kragujevac.

Nelles, J., Kuz, S., Mertens, A., & Schlick, C. M. (2016). Human-centered design of assistance systems for production planning and control: The role of the human in industry 4.0. 2016 IEEE International Conference on Industrial Technology (ICIT). https://doi.org/10.1109/icit.2016.7475093

Osterwalder, A., & Pigneur, Y. (2013). Business model generation: A handbook for visionaries, game changers, and challengers. John Wiley & Sons.

Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. (2015). Value proposition design: How to create products and services customers want. John Wiley & Sons. http://www.orange.ngo/wp-content/uploads/2017/04/value-proposition-design.pdf

Perillo, F., & Marqui, A. (2015). Implications of Adopting a Servitization Strategy: the Case of Pre-transformational perspective. Conference: Spring Servitization Conference 2015. At: Birmingham, UK. Available at: https://research.aston.ac.uk/en/publications/implications-of-adopting-a-servitization-strategy-the-case-of-pre

Pintelon, L. M., & Gelders, L. F. (1992). Maintenance management decision making. European Journal of Operational Research, (58), 1-317. https://doi.org/10.1016/0377-2217(92)90062-E

Polaine, A., Løvlie, L., & Reason, B. (2013). Service design: From insight to inspiration. Rosenfeld Media.

Remis, N., & Remis, N. (2016). A guide to service blueprinting. Adaptive Path. https://www.dropbox.com/s/g60zyqvrmyo3u1v/A%20Guide%20to%20Service%20Blueprinting.pdf?dl=0

Rio, R. (2020, April). Equipment maintenance required during COVID-19 | ARC advisory. Technology Market Research for Industry & Cities ARC Advisory Group. https://www.arcweb.com/blog/equipment-maintenance-still-required-during-covid-19-pandemic

Rosa, A. M. (2015). Rosser Reeves e a filosofia unique selling proposition: elementos para a história da publicidade. In IX Congresso Sopcom (pp. 435-448). Universidade do Porto. https://repositorio-aberto.up.pt/bitstream/10216/106920/2/208245.pdf

Rosson, M. B., & Carroll, J. M. (1996). Object-oriented design from user scenarios. Conference companion on Human factors in computing systems common ground - CHI '96. https://doi.org/10.1145/257089.257359

Salvendy, G., & Karwowski, W. (2010). Introduction to service engineering. John Wiley & Sons.

Singh, M. (2012). Marketing mix of 4P'S for competitive advantage. IOSR Journal of Business and Management, 3(6), 40-45. https://doi.org/10.9790/487x-0364045

Spring, M., & Araujo, L. (2009). Service, services and products: Rethinking operations strategy. International Journal of Operations & Production Management, 29(5), 444-467. https://doi.org/10.1108/01443570910953586

Spring, M., & Araujo, L. (2017). Product biographies in servitization and the circular economy. Industrial Marketing Management, 60, 126-137. https://doi.org/10.1016/j.indmarman.2016.07.001

Stickdorn, M., & Schneider, J. (2010). This Is Service Design Thinking: Basics, Tools, Cases. Amsterdam: BIS Publishers.

Thangaraj, J. & Lakshmi Narayanan, R.. (2018). Industry 1.0 To 4.0: The Evolution of Smart Factories.https://www.researchgate.net/publication/330336790_INDUSTRY_10_TO_40_THE_EVOLUTION_OF_SMART_FACTORIES/citations

Theobald, E. (2016). Vorgehensweise bei Der standardisierten Untersuchung. Management Monitor. Available at: https://www.management-monitor.de/de/infothek/White_Paper_Marktanalyse.pdf?m=1519297736

Wang, S. & Wan, J. & Li, D. & Zhang, C. (2016). Implementing Smart Factory of Industrie 4.0: An Outlook. International Journal of Distributed Sensor Networks. 2016. 1-10. 10.1155/2016/3159805. Available at: https://www.researchgate.net/publication/291385881_Implementing_Smart_Factory_of_Industrie_40_An_Outlook

Xu, Li & He, Wu & Li, Shancang. (2014). Internet of Things in Industries: A Survey. IEEE Transactions on Industrial Informatics. 10. 2233-2243. 10.1109/TII.2014.2300753. //www.researchgate.net/publication/270742269_Internet_of_Things_in_Industries_A_Survey/references

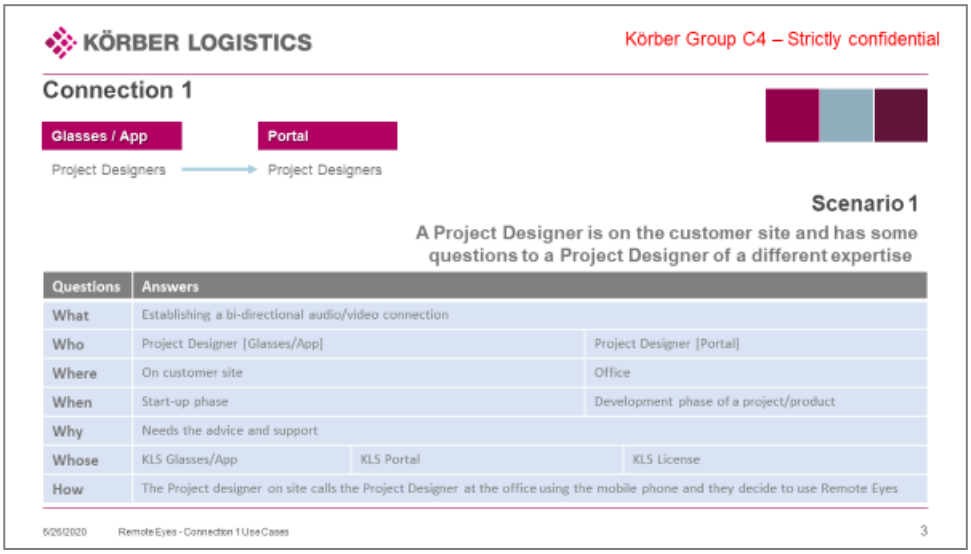
Valçın, S. (2019). Strategic Cost Management Process. 10.3726/b16175.

Zhang, J. & Yao, X. Zhou, J. & Jiang, J. & X. "Self-Organizing Manufacturing: Current Status and Prospect for Industry 4.0," 2017 5th International Conference on Enterprise Systems (ES), Beijing, 2017, pp. 319-326, doi: 10.1109/ES.2017.59.

Zhang, W., & Banerji, S. (2017). Challenges of servitization: A systematic literature review. Industrial Marketing Management, 65, 217-227. https://doi.org/10.1016/j.indmarman.2017.06.003

Zineldin, M., & Philipson, S. (2007). Kotler and Borden are not dead: Myth of relationship marketing and truth of the 4Ps. Journal of Consumer Marketing, 24(4), 229-241. https://doi.org/10.1108/07363760710756011

APPENDIX A: Use Case Scenarios Analysis



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 1

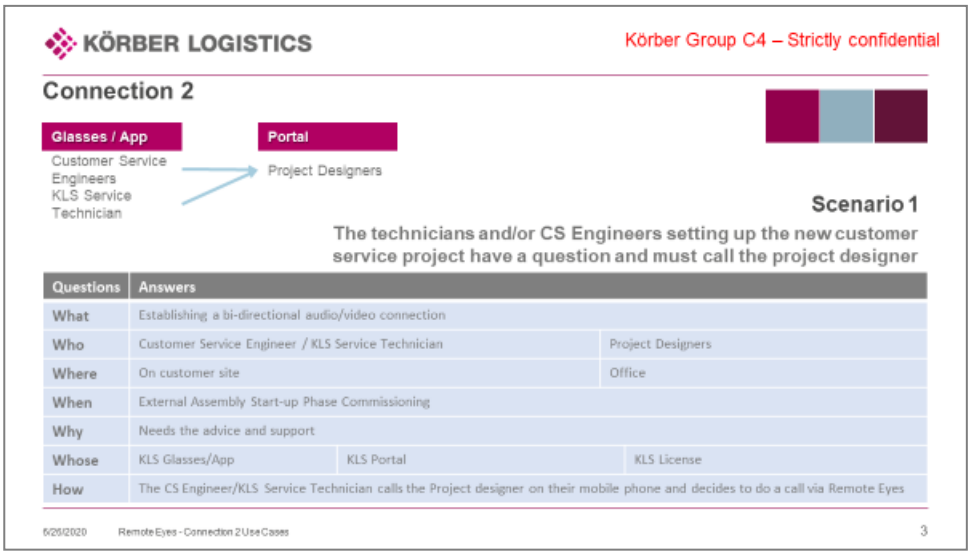
Glasses / App — Project Designers → **Portal** — Project Designers

Scenario 1

A Project Designer is on the customer site and has some questions to a Project Designer of a different expertise

Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	Project Designer [Glasses/App]	Project Designer [Portal]	
Where	On customer site	Office	
When	Start-up phase	Development phase of a project/product	
Why	Needs the advice and support		
Whose	KLS Glasses/App	KLS Portal	KLS License
How	The Project designer on site calls the Project Designer at the office using the mobile phone and they decide to use Remote Eyes		

6/26/2020 Remote Eyes - Connection 1 Use Cases 3



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 2

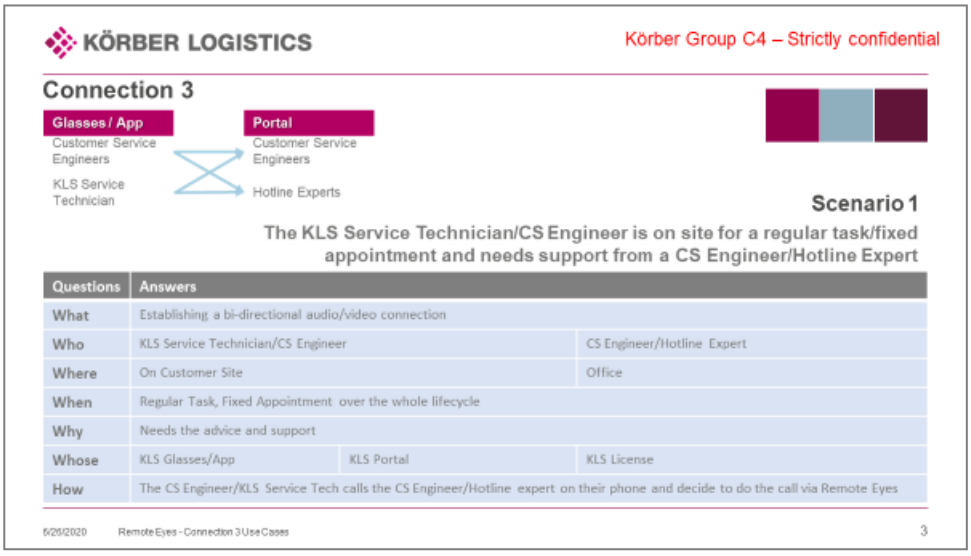
Glasses / App — Customer Service Engineers, KLS Service Technician → **Portal** — Project Designers

Scenario 1

The technicians and/or CS Engineers setting up the new customer service project have a question and must call the project designer

Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	Customer Service Engineer / KLS Service Technician	Project Designers	
Where	On customer site	Office	
When	External Assembly Start-up Phase Commissioning		
Why	Needs the advice and support		
Whose	KLS Glasses/App	KLS Portal	KLS License
How	The CS Engineer/KLS Service Technician calls the Project designer on their mobile phone and decides to do a call via Remote Eyes		

6/26/2020 Remote Eyes - Connection 2 Use Cases 3



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 3

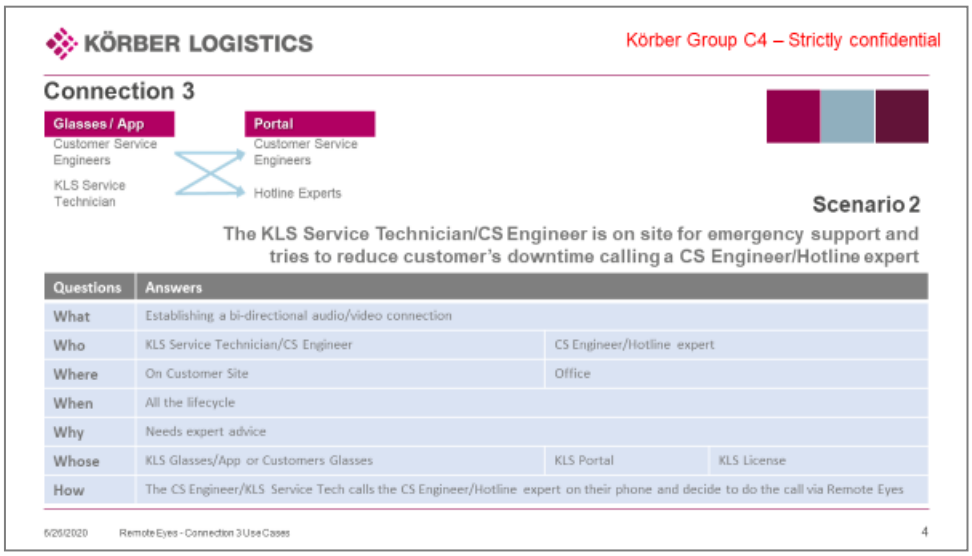
Glasses / App — Customer Service Engineers, KLS Service Technician → **Portal** — Customer Service Engineers, Hotline Experts

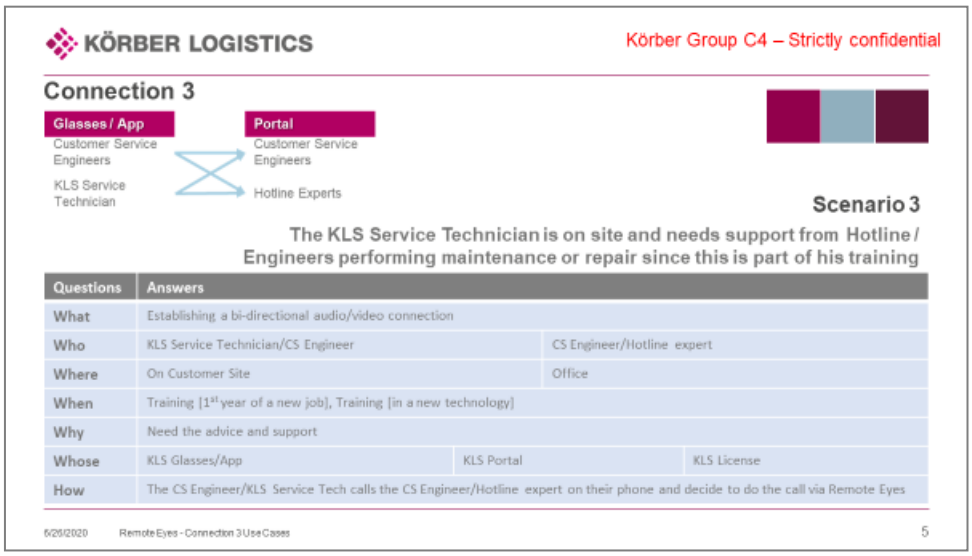
Scenario 1

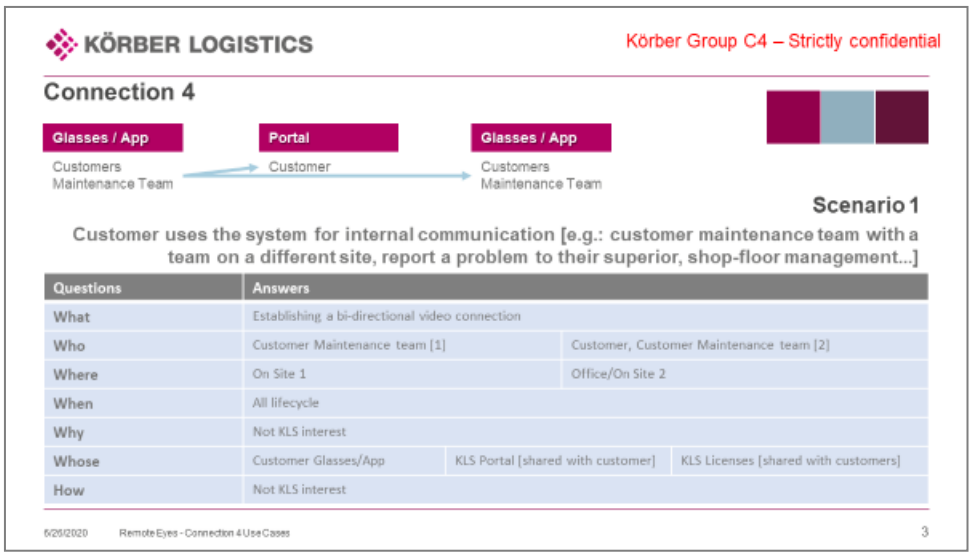
The KLS Service Technician/CS Engineer is on site for a regular task/fixed appointment and needs support from a CS Engineer/Hotline Expert

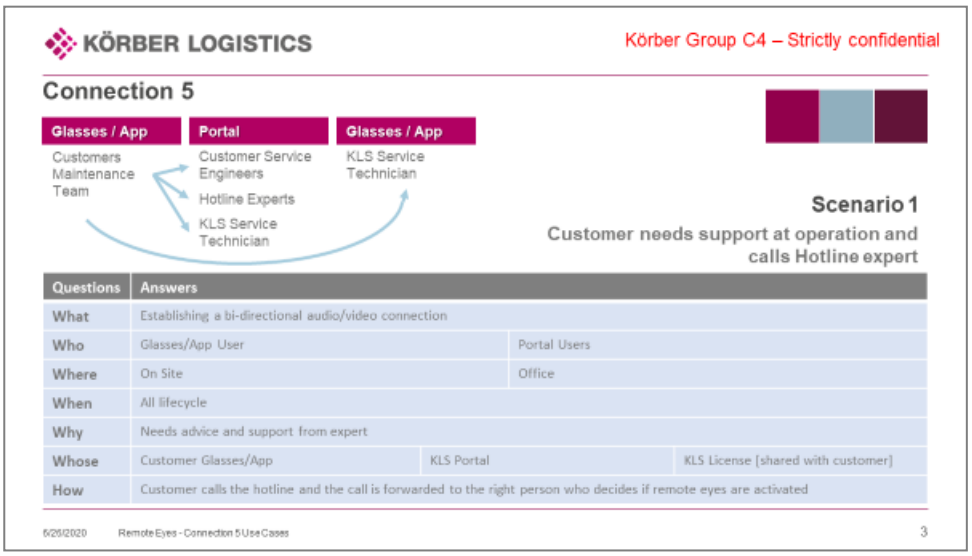
Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	KLS Service Technician/CS Engineer	CS Engineer/Hotline Expert	
Where	On Customer Site	Office	
When	Regular Task, Fixed Appointment over the whole lifecycle		
Why	Needs the advice and support		
Whose	KLS Glasses/App	KLS Portal	KLS License
How	The CS Engineer/KLS Service Tech calls the CS Engineer/Hotline expert on their phone and decide to do the call via Remote Eyes		

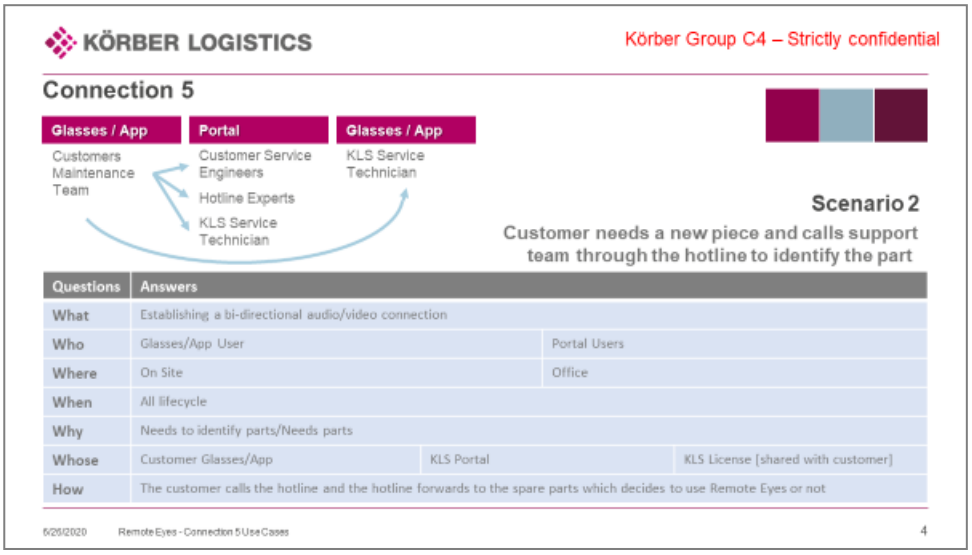
6/26/2020 Remote Eyes - Connection 3 Use Cases 3

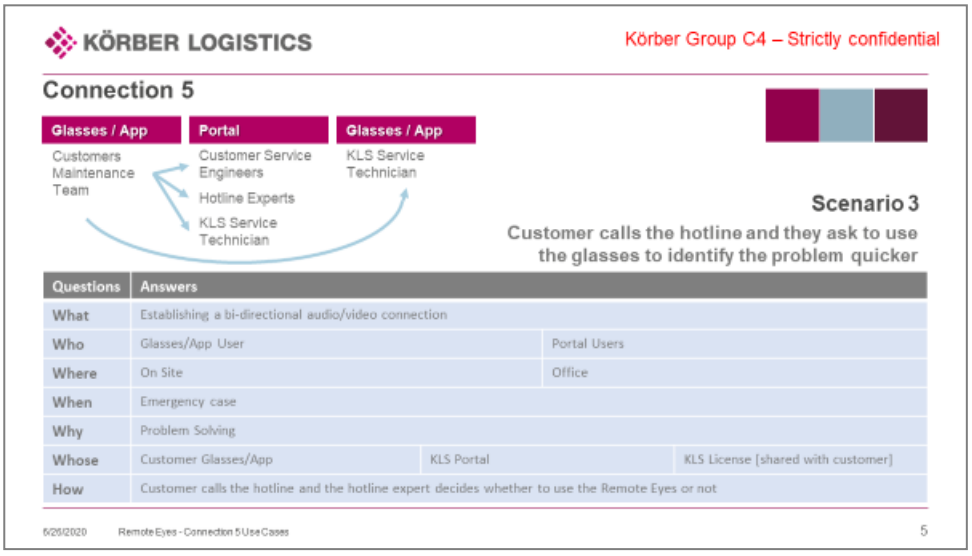

KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 3
Glasses / App
Customer Service Engineers
KLS Service Technician
Portal
Customer Service Engineers
Hotline Experts
Scenario 2
The KLS Service Technician/CS Engineer is on site for emergency support and tries to reduce customer's downtime calling a CS Engineer/Hotline expert
Questions | Answers
What | Establishing a bi-directional audio/video connection
Who | KLS Service Technician/CS Engineer | CS Engineer/Hotline expert
Where | On Customer Site | Office
When | All the lifecycle
Why | Needs expert advice
Whose | KLS Glasses/App or Customers Glasses | KLS Portal | KLS License
How | The CS Engineer/KLS Service Tech calls the CS Engineer/Hotline expert on their phone and decide to do the call via Remote Eyes
6/26/2020 Remote Eyes - Connection 3 Use Cases 4

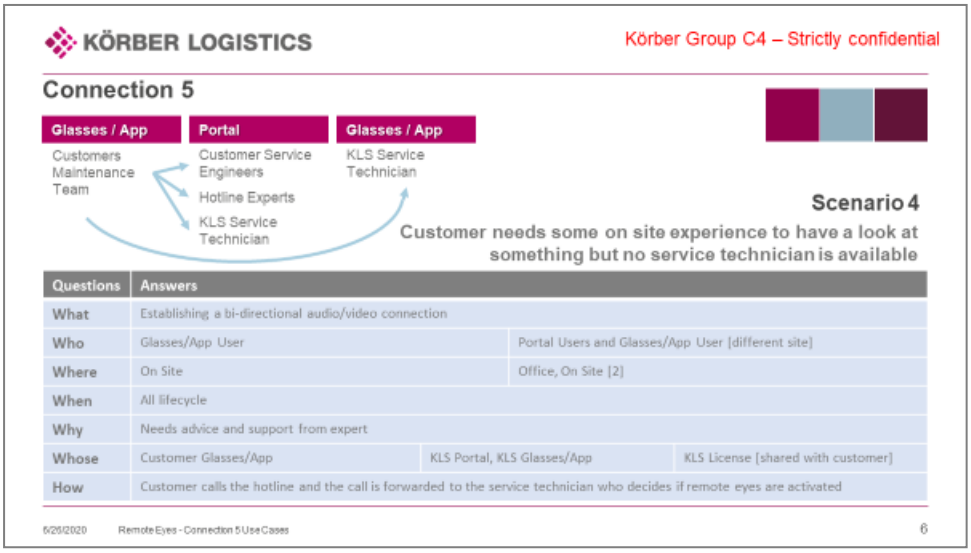

KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 3
Glasses / App
Customer Service Engineers
KLS Service Technician
Portal
Customer Service Engineers
Hotline Experts
Scenario 3
The KLS Service Technician is on site and needs support from Hotline / Engineers performing maintenance or repair since this is part of his training
Questions | Answers
What | Establishing a bi-directional audio/video connection
Who | KLS Service Technician/CS Engineer | CS Engineer/Hotline expert
Where | On Customer Site | Office
When | Training [1st year of a new job], Training [in a new technology]
Why | Need the advice and support
Whose | KLS Glasses/App | KLS Portal | KLS License
How | The CS Engineer/KLS Service Tech calls the CS Engineer/Hotline expert on their phone and decide to do the call via Remote Eyes
6/26/2020 Remote Eyes - Connection 3 Use Cases 5


KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 4
Glasses / App
Customers Maintenance Team
Portal
Customer
Glasses / App
Customers Maintenance Team
Scenario 1
Customer uses the system for internal communication [e.g.: customer maintenance team with a team on a different site, report a problem to their superior, shop-floor management...]
Questions | Answers
What | Establishing a bi-directional video connection
Who | Customer Maintenance team [1] | Customer, Customer Maintenance team [2]
Where | On Site 1 | Office/On Site 2
When | All lifecycle
Why | Not KLS interest
Whose | Customer Glasses/App | KLS Portal [shared with customer] | KLS Licenses [shared with customers]
How | Not KLS interest
6/26/2020 Remote Eyes - Connection 4 Use Cases 3


KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 5
Glasses / App
Portal
Glasses / App
Customers Maintenance Team
Customer Service Engineers
Hotline Experts
KLS Service Technician
KLS Service Technician
Scenario 1
Customer needs support at operation and calls Hotline expert
Questions
Answers
What
Establishing a bi-directional audio/video connection
Who
Glasses/App User
Portal Users
Where
On Site
Office
When
All lifecycle
Why
Needs advice and support from expert
Whose
Customer Glasses/App
KLS Portal
KLS License [shared with customer]
How
Customer calls the hotline and the call is forwarded to the right person who decides if remote eyes are activated
6/26/2020
Remote Eyes - Connection 5 Use Cases
3


KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 5
Glasses / App
Portal
Glasses / App
Customers Maintenance Team
Customer Service Engineers
Hotline Experts
KLS Service Technician
KLS Service Technician
Scenario 2
Customer needs a new piece and calls support team through the hotline to identify the part
Questions
Answers
What
Establishing a bi-directional audio/video connection
Who
Glasses/App User
Portal Users
Where
On Site
Office
When
All lifecycle
Why
Needs to identify parts/Needs parts
Whose
Customer Glasses/App
KLS Portal
KLS License [shared with customer]
How
The customer calls the hotline and the hotline forwards to the spare parts which decides to use Remote Eyes or not
6/26/2020
Remote Eyes - Connection 5 Use Cases
4


KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 5
Glasses / App
Portal
Glasses / App
Customers Maintenance Team
Customer Service Engineers
Hotline Experts
KLS Service Technician
KLS Service Technician
Scenario 3
Customer calls the hotline and they ask to use the glasses to identify the problem quicker
Questions
Answers
What
Establishing a bi-directional audio/video connection
Who
Glasses/App User
Portal Users
Where
On Site
Office
When
Emergency case
Why
Problem Solving
Whose
Customer Glasses/App
KLS Portal
KLS License [shared with customer]
How
Customer calls the hotline and the hotline expert decides whether to use the Remote Eyes or not
6/26/2020
Remote Eyes - Connection 5 Use Cases
5



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

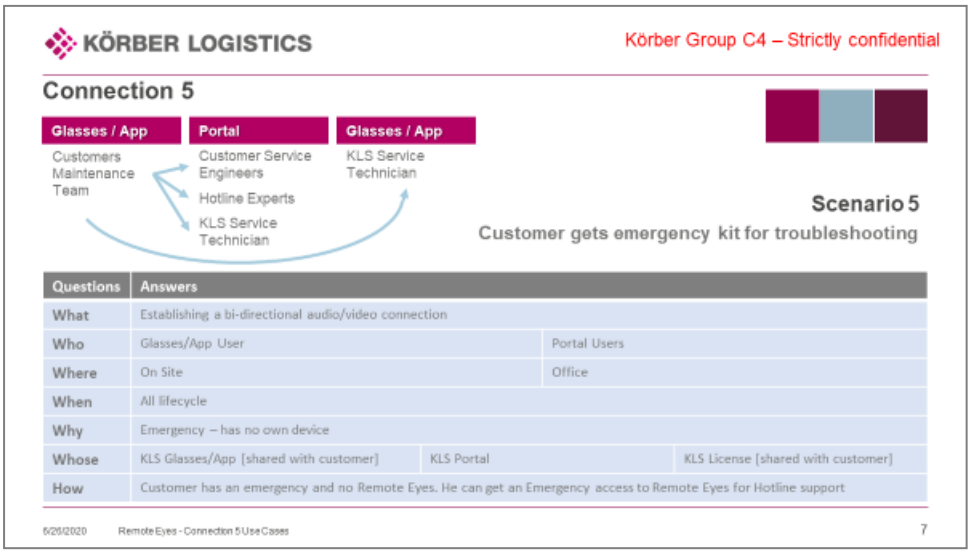
Connection 5

Scenario 4

Customer needs some on site experience to have a look at something but no service technician is available

Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	Glasses/App User	Portal Users and Glasses/App User [different site]	
Where	On Site	Office, On Site [2]	
When	All lifecycle		
Why	Needs advice and support from expert		
Whose	Customer Glasses/App	KLS Portal, KLS Glasses/App	KLS License [shared with customer]
How	Customer calls the hotline and the call is forwarded to the service technician who decides if remote eyes are activated		

6/26/2020 Remote Eyes - Connection 5 Use Cases 6



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

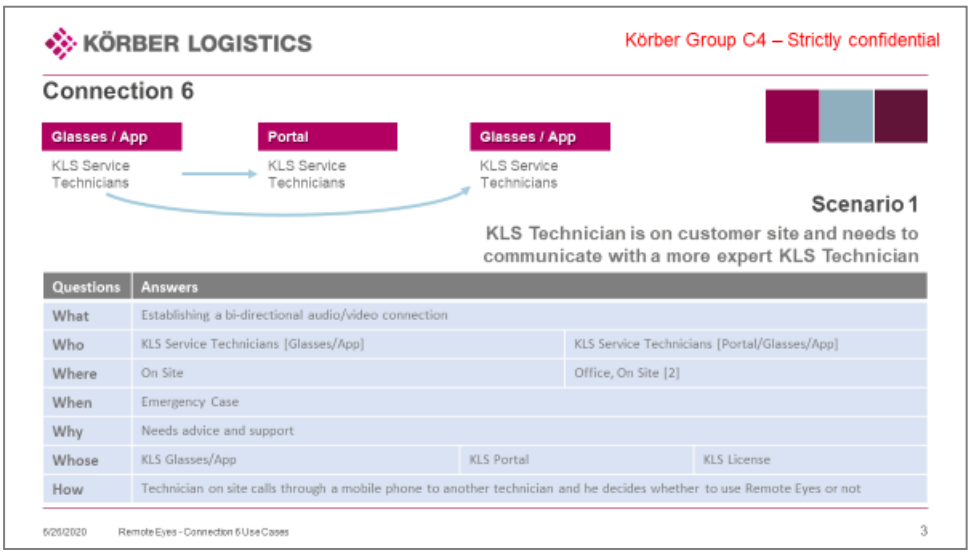
Connection 5

Scenario 5

Customer gets emergency kit for troubleshooting

Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	Glasses/App User	Portal Users	
Where	On Site	Office	
When	All lifecycle		
Why	Emergency – has no own device		
Whose	KLS Glasses/App [shared with customer]	KLS Portal	KLS License [shared with customer]
How	Customer has an emergency and no Remote Eyes. He can get an Emergency access to Remote Eyes for Hotline support		

6/26/2020 Remote Eyes - Connection 5 Use Cases 7



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

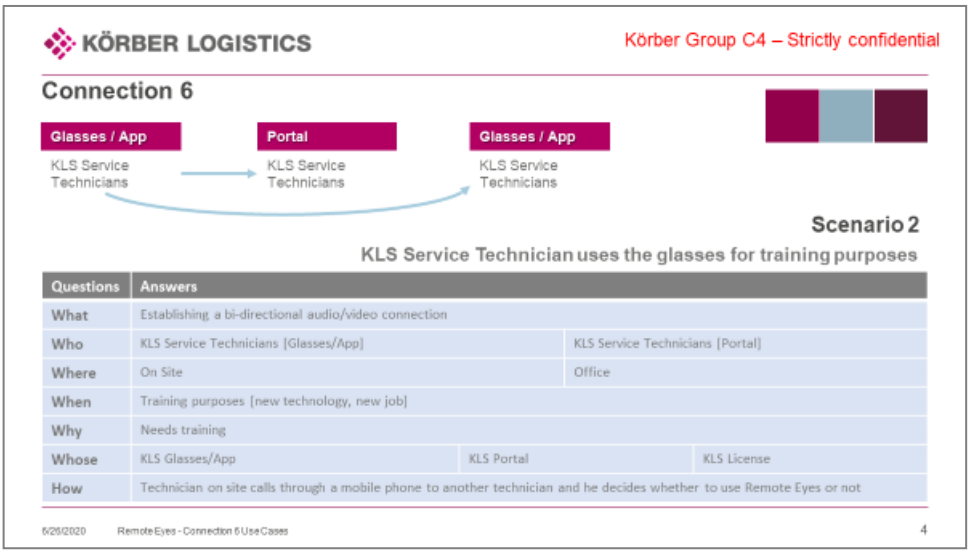
Connection 6

Scenario 1

KLS Technician is on customer site and needs to communicate with a more expert KLS Technician

Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	KLS Service Technicians [Glasses/App]	KLS Service Technicians [Portal/Glasses/App]	
Where	On Site	Office, On Site [2]	
When	Emergency Case		
Why	Needs advice and support		
Whose	KLS Glasses/App	KLS Portal	KLS License
How	Technician on site calls through a mobile phone to another technician and he decides whether to use Remote Eyes or not		

6/26/2020 Remote Eyes - Connection 6 Use Cases 3



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 6

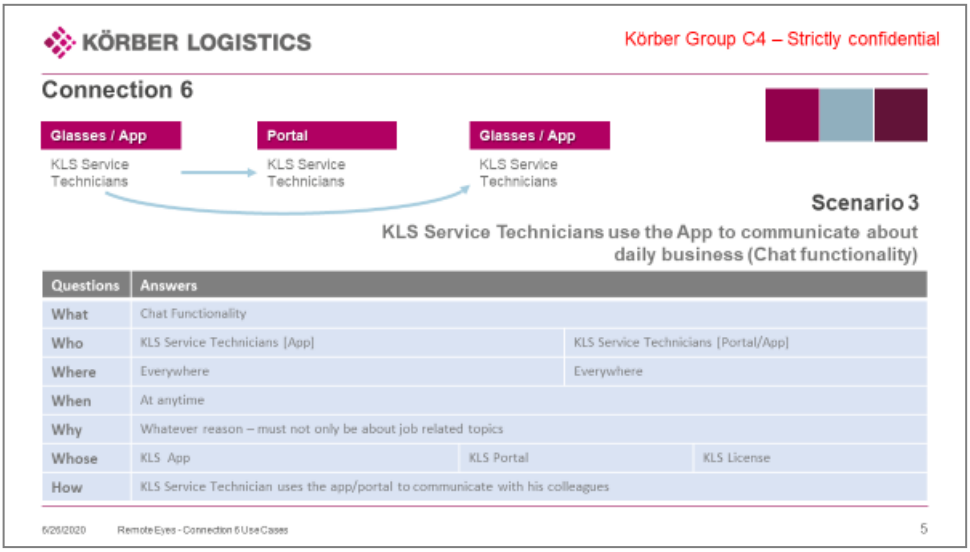
Glasses / App (KLS Service Technicians) → Portal (KLS Service Technicians) → Glasses / App (KLS Service Technicians)

Scenario 2

KLS Service Technician uses the glasses for training purposes

Questions	Answers		
What	Establishing a bi-directional audio/video connection		
Who	KLS Service Technicians (Glasses/App)	KLS Service Technicians (Portal)	
Where	On Site	Office	
When	Training purposes (new technology, new job)		
Why	Needs training		
Whose	KLS Glasses/App	KLS Portal	KLS License
How	Technician on site calls through a mobile phone to another technician and he decides whether to use Remote Eyes or not		

6/26/2020 Remote Eyes - Connection 6 Use Cases 4



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 6

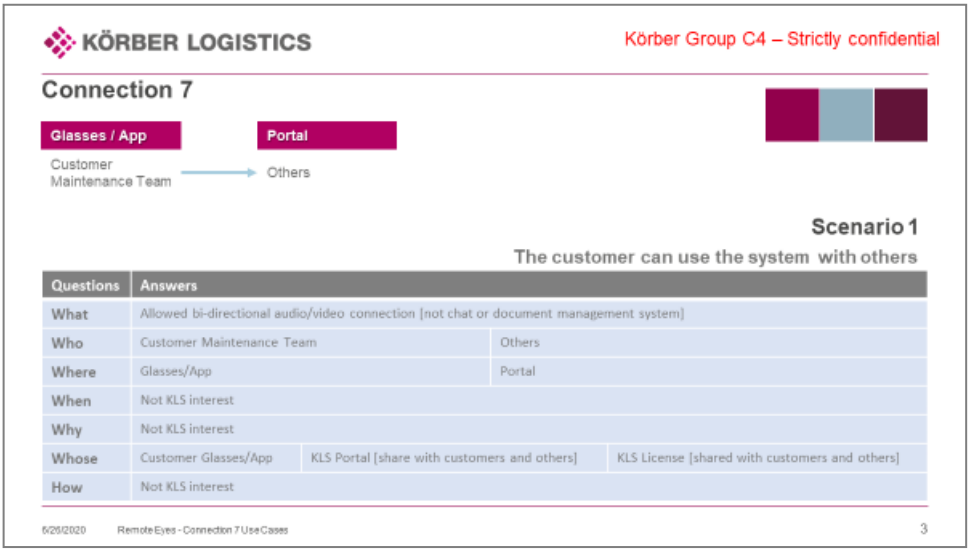
Glasses / App (KLS Service Technicians) → Portal (KLS Service Technicians) → Glasses / App (KLS Service Technicians)

Scenario 3

KLS Service Technicians use the App to communicate about daily business (Chat functionality)

Questions	Answers		
What	Chat Functionality		
Who	KLS Service Technicians (App)	KLS Service Technicians (Portal/App)	
Where	Everywhere	Everywhere	
When	At anytime		
Why	Whatever reason – must not only be about job related topics		
Whose	KLS App	KLS Portal	KLS License
How	KLS Service Technician uses the app/portal to communicate with his colleagues		

6/26/2020 Remote Eyes - Connection 6 Use Cases 5



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 7

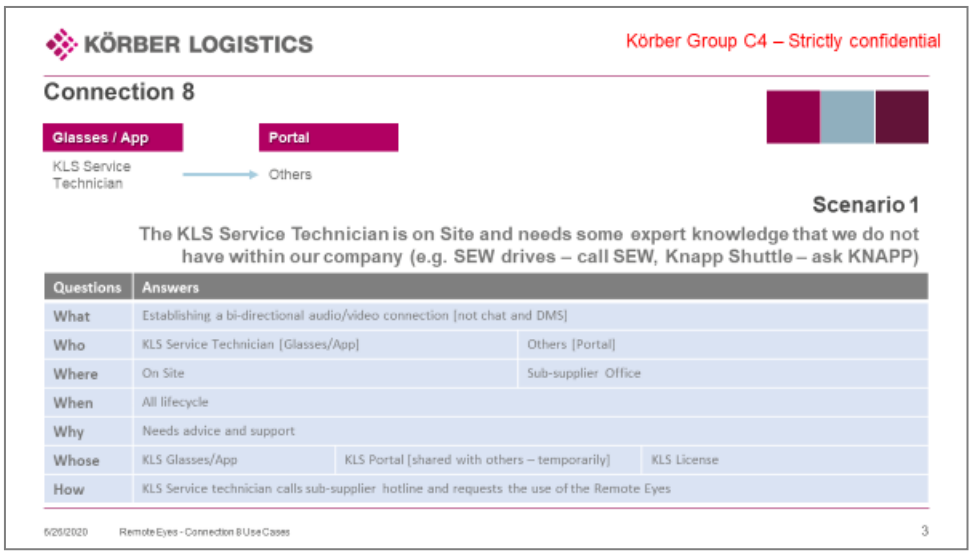
Glasses / App (Customer Maintenance Team) → Portal (Others)

Scenario 1

The customer can use the system with others

Questions	Answers		
What	Allowed bi-directional audio/video connection (not chat or document management system)		
Who	Customer Maintenance Team	Others	
Where	Glasses/App	Portal	
When	Not KLS interest		
Why	Not KLS interest		
Whose	Customer Glasses/App	KLS Portal (share with customers and others)	KLS License (shared with customers and others)
How	Not KLS interest		

6/26/2020 Remote Eyes - Connection 7 Use Cases 3



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 8

Glasses / App → **Portal**

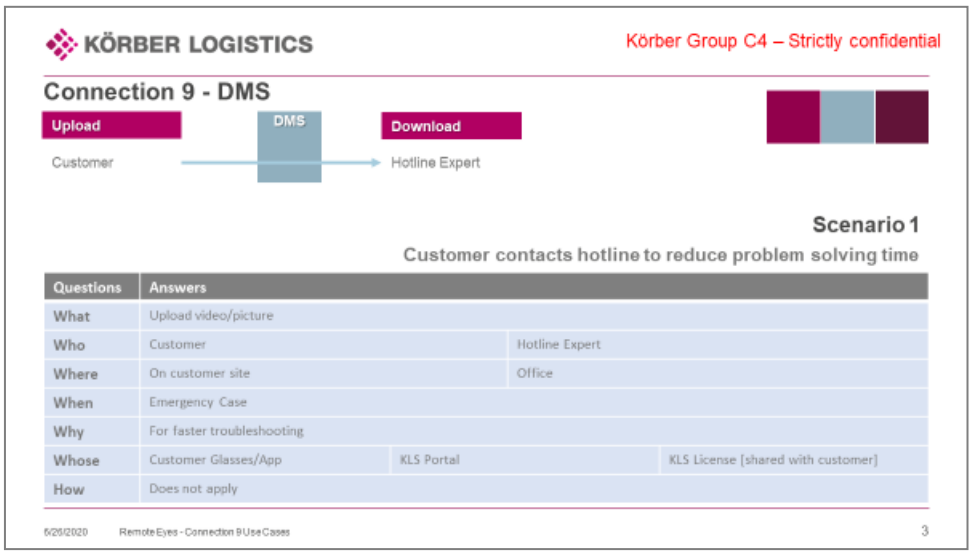
KLS Service Technician → Others

Scenario 1

The KLS Service Technician is on Site and needs some expert knowledge that we do not have within our company (e.g. SEW drives – call SEW, Knapp Shuttle – ask KNAPP)

Questions	Answers		
What	Establishing a bi-directional audio/video connection (not chat and DMS)		
Who	KLS Service Technician (Glasses/App)	Others (Portal)	
Where	On Site	Sub-supplier Office	
When	All lifecycle		
Why	Needs advice and support		
Whose	KLS Glasses/App	KLS Portal (shared with others – temporarily)	KLS License
How	KLS Service technician calls sub-supplier hotline and requests the use of the Remote Eyes		

6/26/2020 Remote Eyes - Connection 8 Use Cases 3



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 9 - DMS

Upload → **DMS** → **Download**

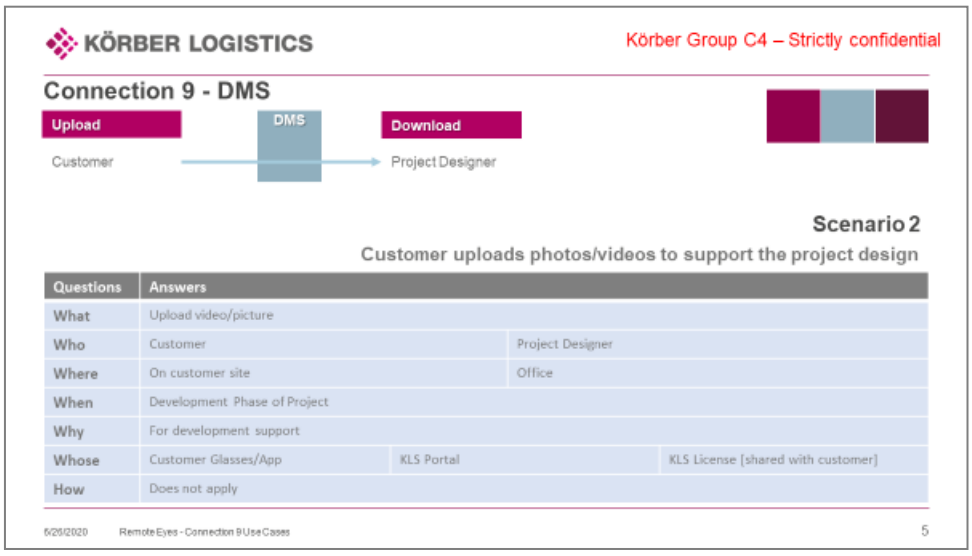
Customer → Hotline Expert

Scenario 1

Customer contacts hotline to reduce problem solving time

Questions	Answers		
What	Upload video/picture		
Who	Customer	Hotline Expert	
Where	On customer site	Office	
When	Emergency Case		
Why	For faster troubleshooting		
Whose	Customer Glasses/App	KLS Portal	KLS License (shared with customer)
How	Does not apply		

6/26/2020 Remote Eyes - Connection 9 Use Cases 3



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 9 - DMS

Upload → **DMS** → **Download**

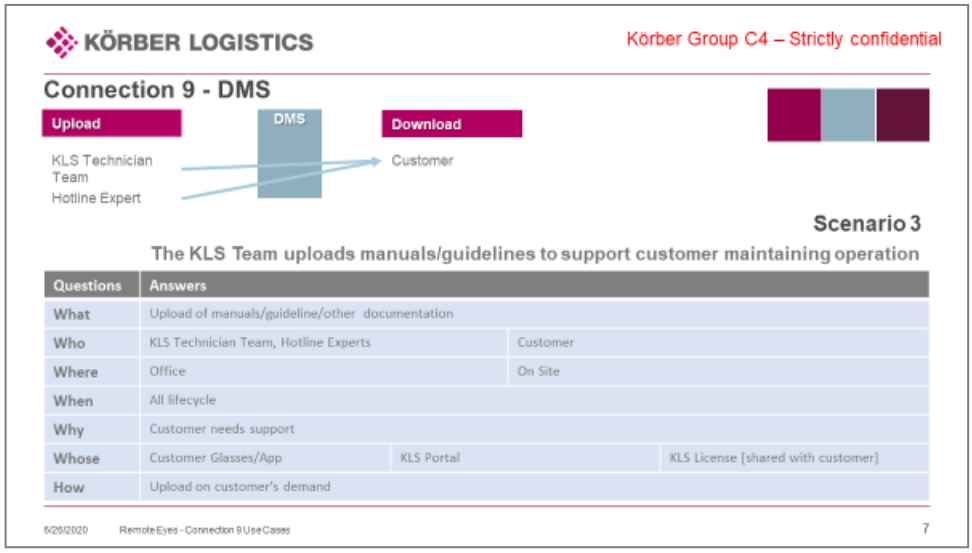
Customer → Project Designer

Scenario 2

Customer uploads photos/videos to support the project design

Questions	Answers		
What	Upload video/picture		
Who	Customer	Project Designer	
Where	On customer site	Office	
When	Development Phase of Project		
Why	For development support		
Whose	Customer Glasses/App	KLS Portal	KLS License (shared with customer)
How	Does not apply		

6/26/2020 Remote Eyes - Connection 9 Use Cases 5



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 9 - DMS

Upload: KLS Technician Team, Hotline Expert

DMS

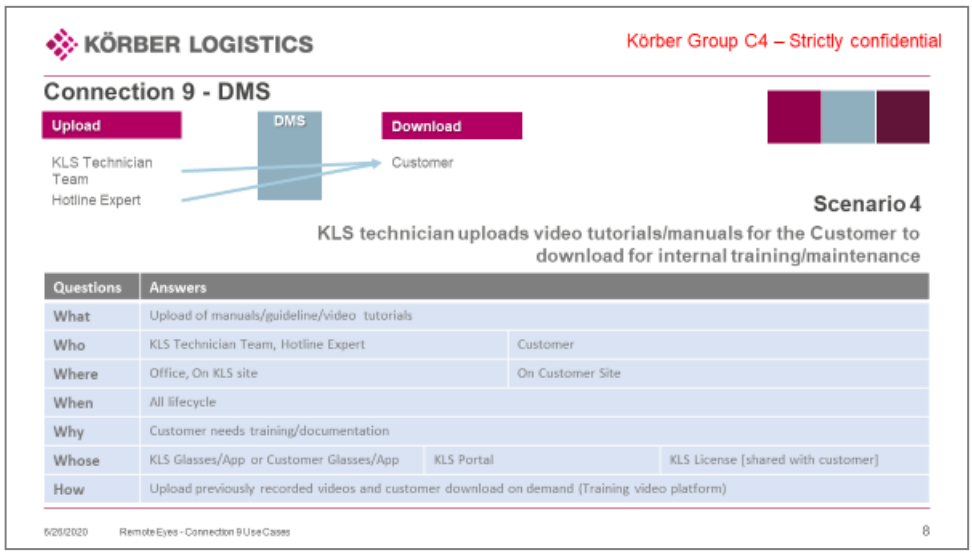
Download: Customer

Scenario 3

The KLS Team uploads manuals/guidelines to support customer maintaining operation

Questions	Answers		
What	Upload of manuals/guideline/other documentation		
Who	KLS Technician Team, Hotline Experts	Customer	
Where	Office	On Site	
When	All lifecycle		
Why	Customer needs support		
Whose	Customer Glasses/App	KLS Portal	KLS License [shared with customer]
How	Upload on customer's demand		

6/26/2020 RemoteEyes - Connection 9 Use Cases 7



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 9 - DMS

Upload: KLS Technician Team, Hotline Expert

DMS

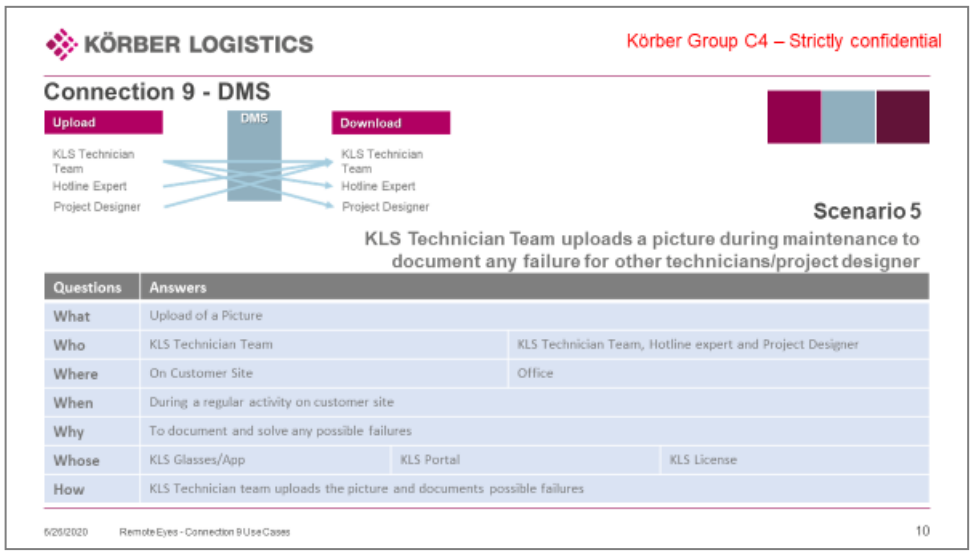
Download: Customer

Scenario 4

KLS technician uploads video tutorials/manuals for the Customer to download for internal training/maintenance

Questions	Answers		
What	Upload of manuals/guideline/video tutorials		
Who	KLS Technician Team, Hotline Expert	Customer	
Where	Office, On KLS site	On Customer Site	
When	All lifecycle		
Why	Customer needs training/documentation		
Whose	KLS Glasses/App or Customer Glasses/App	KLS Portal	KLS License [shared with customer]
How	Upload previously recorded videos and customer download on demand (Training video platform)		

6/26/2020 RemoteEyes - Connection 9 Use Cases 8



KÖRBER LOGISTICS

Körber Group C4 – Strictly confidential

Connection 9 - DMS

Upload: KLS Technician Team, Hotline Expert, Project Designer

DMS

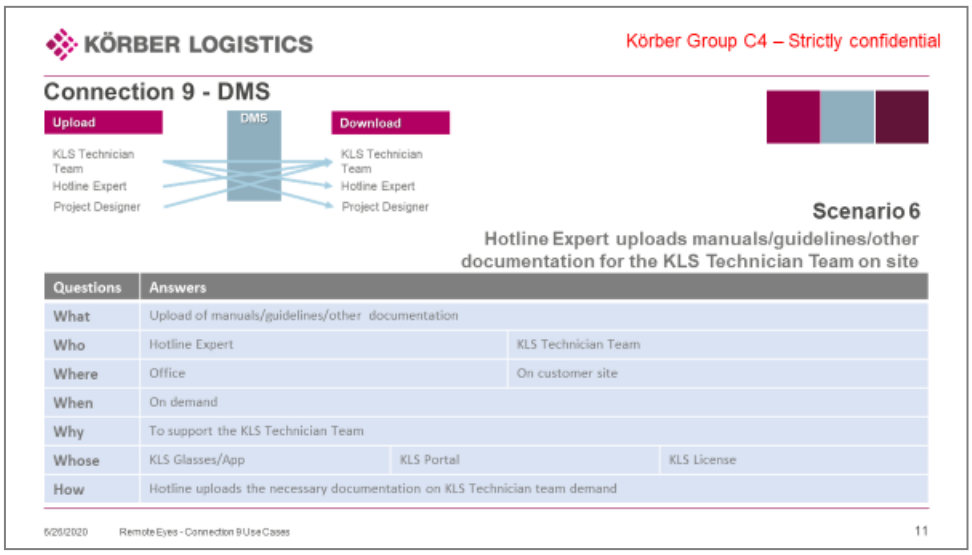
Download: KLS Technician Team, Hotline Expert, Project Designer

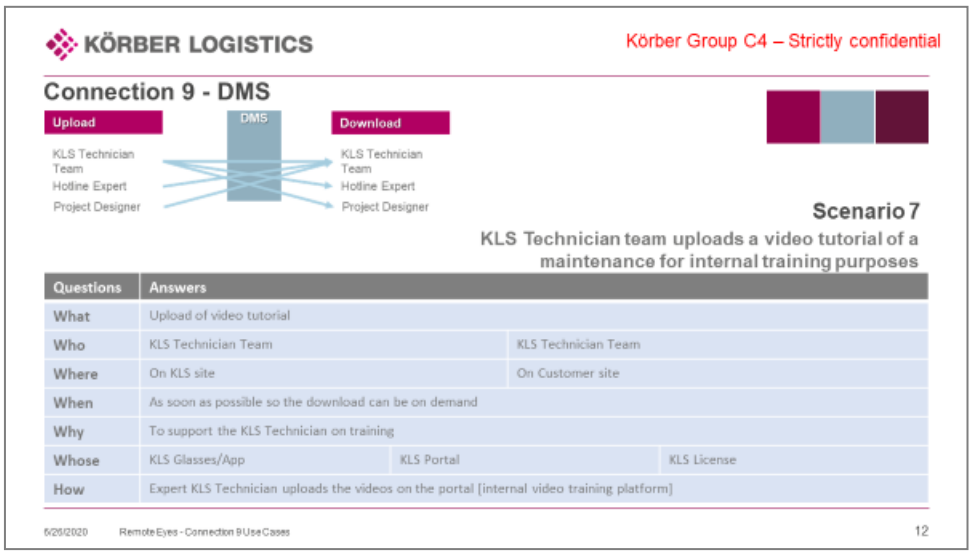
Scenario 5

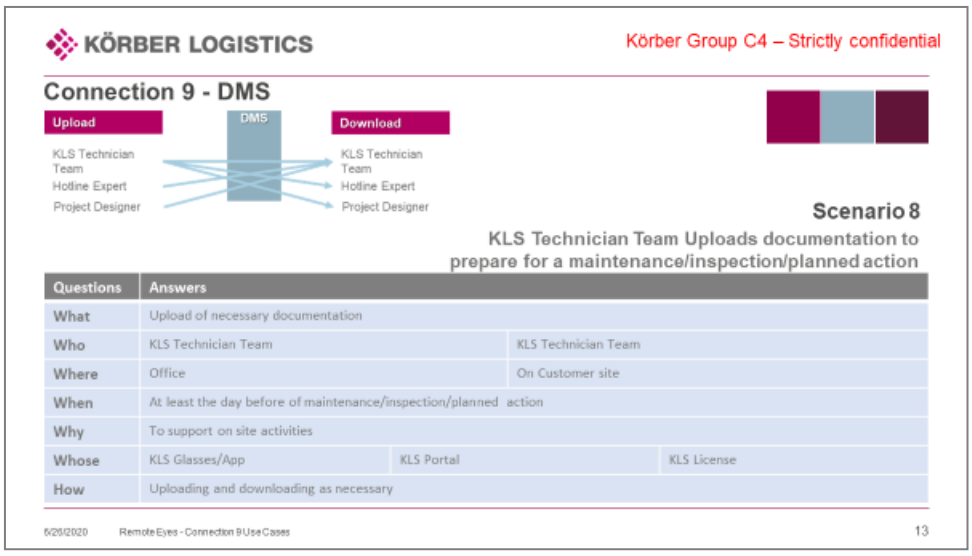
KLS Technician Team uploads a picture during maintenance to document any failure for other technicians/project designer

Questions	Answers		
What	Upload of a Picture		
Who	KLS Technician Team	KLS Technician Team, Hotline expert and Project Designer	
Where	On Customer Site	Office	
When	During a regular activity on customer site		
Why	To document and solve any possible failures		
Whose	KLS Glasses/App	KLS Portal	KLS License
How	KLS Technician team uploads the picture and documents possible failures		

6/26/2020 RemoteEyes - Connection 9 Use Cases 10

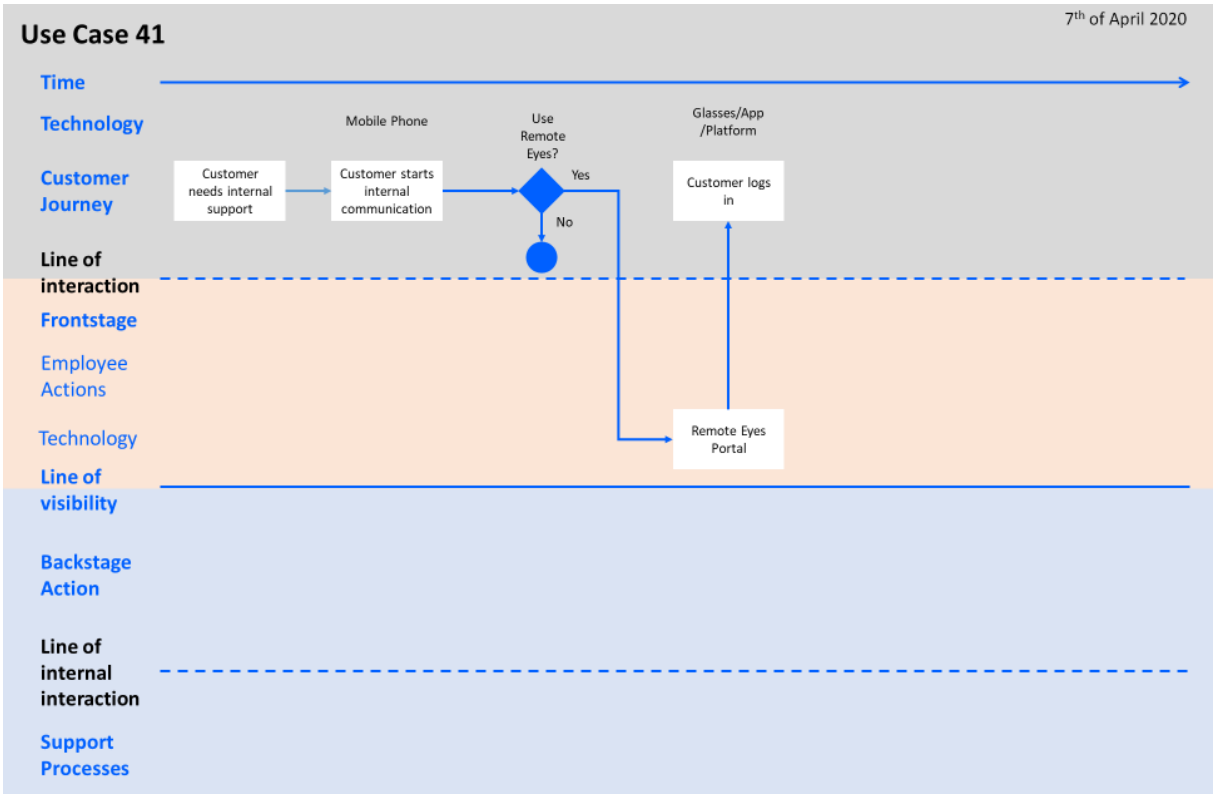

KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 9 - DMS
Upload
DMS
Download
KLS Technician Team
Hotline Expert
Project Designer
KLS Technician Team
Hotline Expert
Project Designer
Scenario 6
Hotline Expert uploads manuals/guidelines/other documentation for the KLS Technician Team on site
Questions
Answers
What
Upload of manuals/guidelines/other documentation
Who
Hotline Expert
KLS Technician Team
Where
Office
On customer site
When
On demand
Why
To support the KLS Technician Team
Whose
KLS Glasses/App
KLS Portal
KLS License
How
Hotline uploads the necessary documentation on KLS Technician team demand
6/26/2020
Remote Eyes - Connection 9 Use Cases
11


KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 9 - DMS
Upload
DMS
Download
KLS Technician Team
Hotline Expert
Project Designer
KLS Technician Team
Hotline Expert
Project Designer
Scenario 7
KLS Technician team uploads a video tutorial of a maintenance for internal training purposes
Questions
Answers
What
Upload of video tutorial
Who
KLS Technician Team
KLS Technician Team
Where
On KLS site
On Customer site
When
As soon as possible so the download can be on demand
Why
To support the KLS Technician on training
Whose
KLS Glasses/App
KLS Portal
KLS License
How
Expert KLS Technician uploads the videos on the portal [internal video training platform]
6/26/2020
Remote Eyes - Connection 9 Use Cases
12

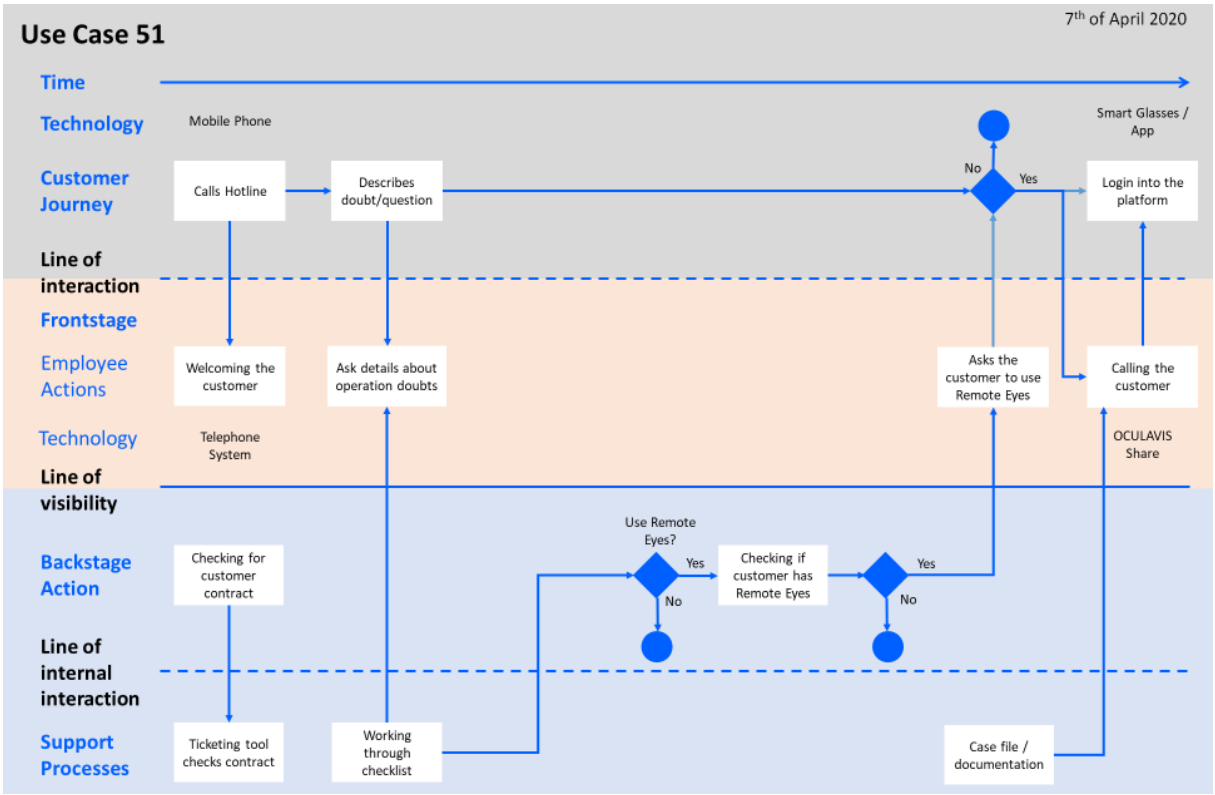

KÖRBER LOGISTICS
Körber Group C4 – Strictly confidential
Connection 9 - DMS
Upload
DMS
Download
KLS Technician Team
Hotline Expert
Project Designer
KLS Technician Team
Hotline Expert
Project Designer
Scenario 8
KLS Technician Team Uploads documentation to prepare for a maintenance/inspection/planned action
Questions
Answers
What
Upload of necessary documentation
Who
KLS Technician Team
KLS Technician Team
Where
Office
On Customer site
When
At least the day before of maintenance/inspection/planned action
Why
To support on site activities
Whose
KLS Glasses/App
KLS Portal
KLS License
How
Uploading and downloading as necessary
6/26/2020
Remote Eyes - Connection 9 Use Cases
13

APPENDIX B: Service Blueprints of Sales UCS

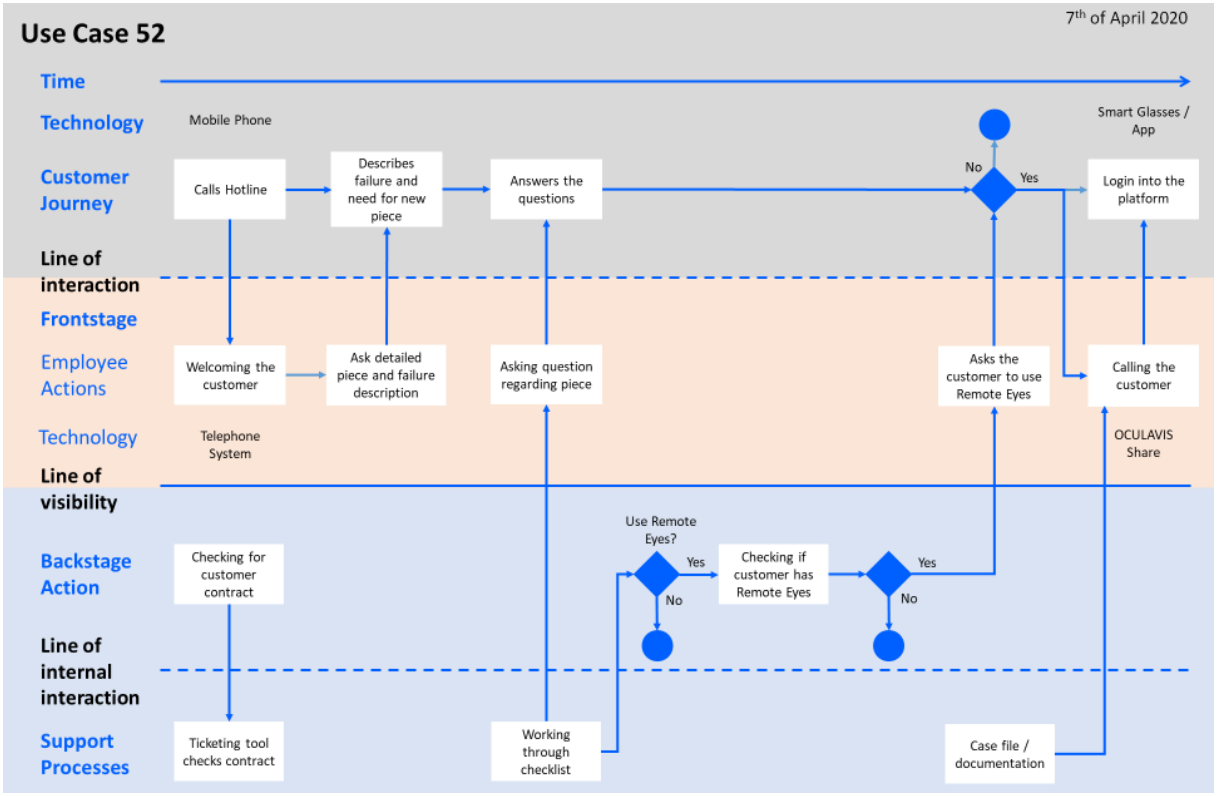
Use Case 41 – Service Blueprint



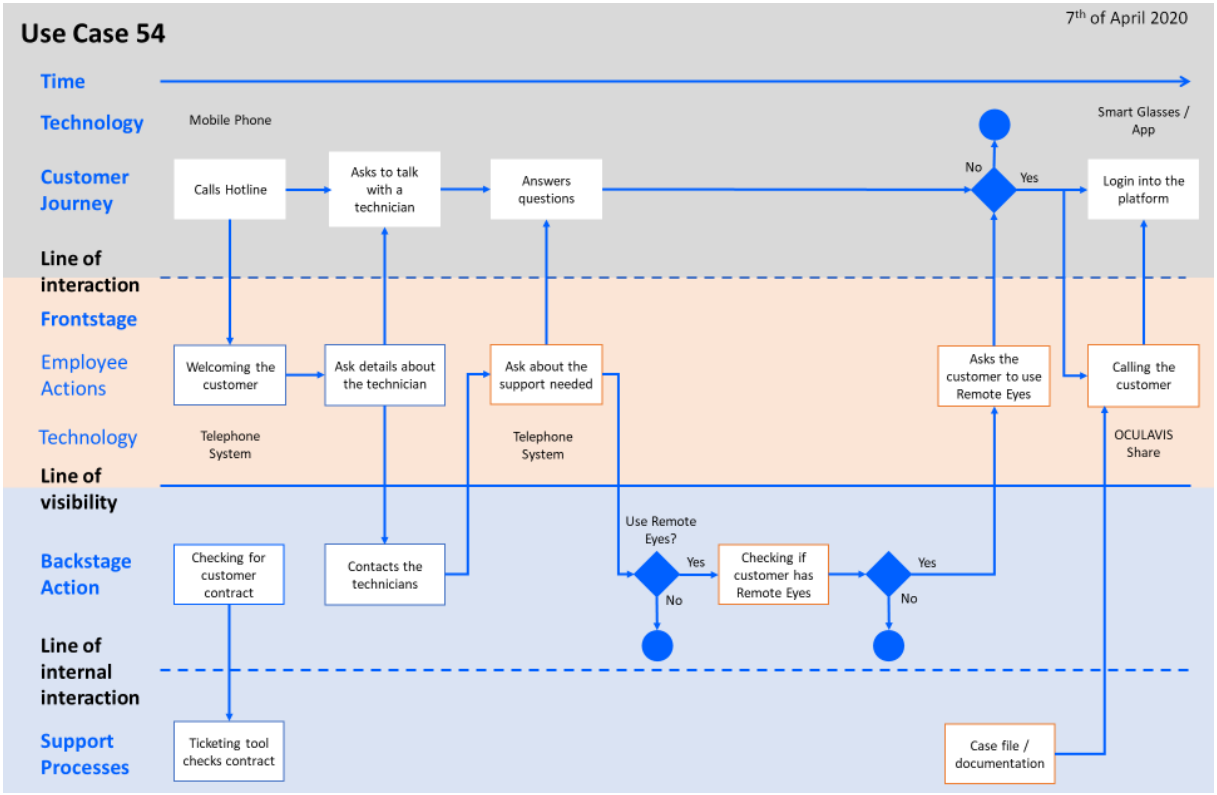
Use Case 51 – Service Blueprint



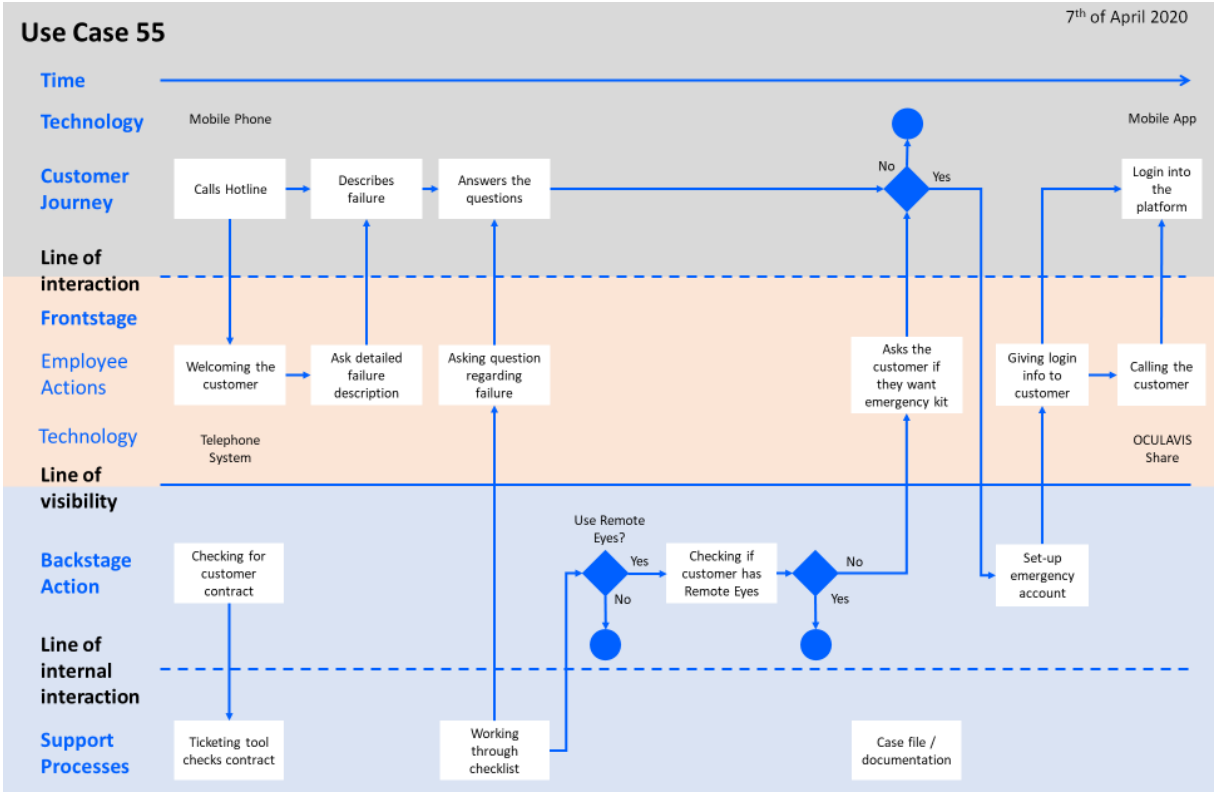
Use Case 52 – Use Case



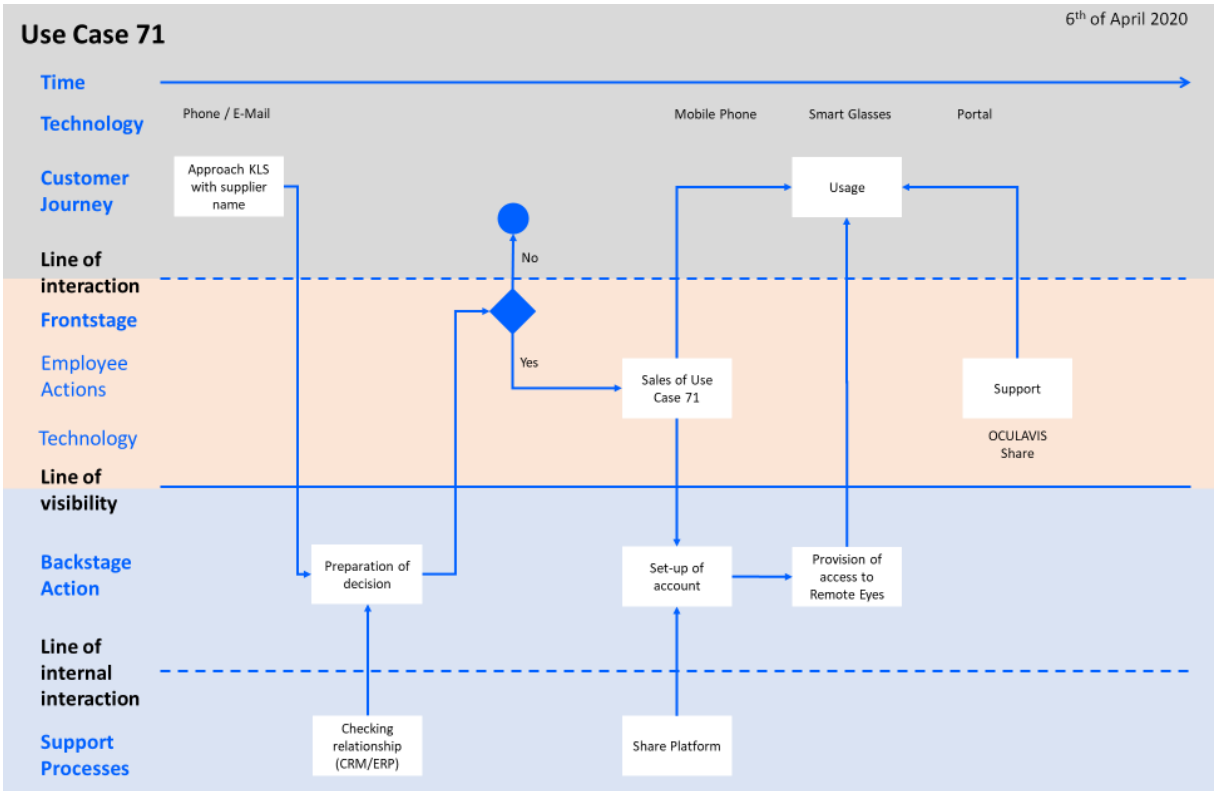
Use Case 54 – Service Blueprint



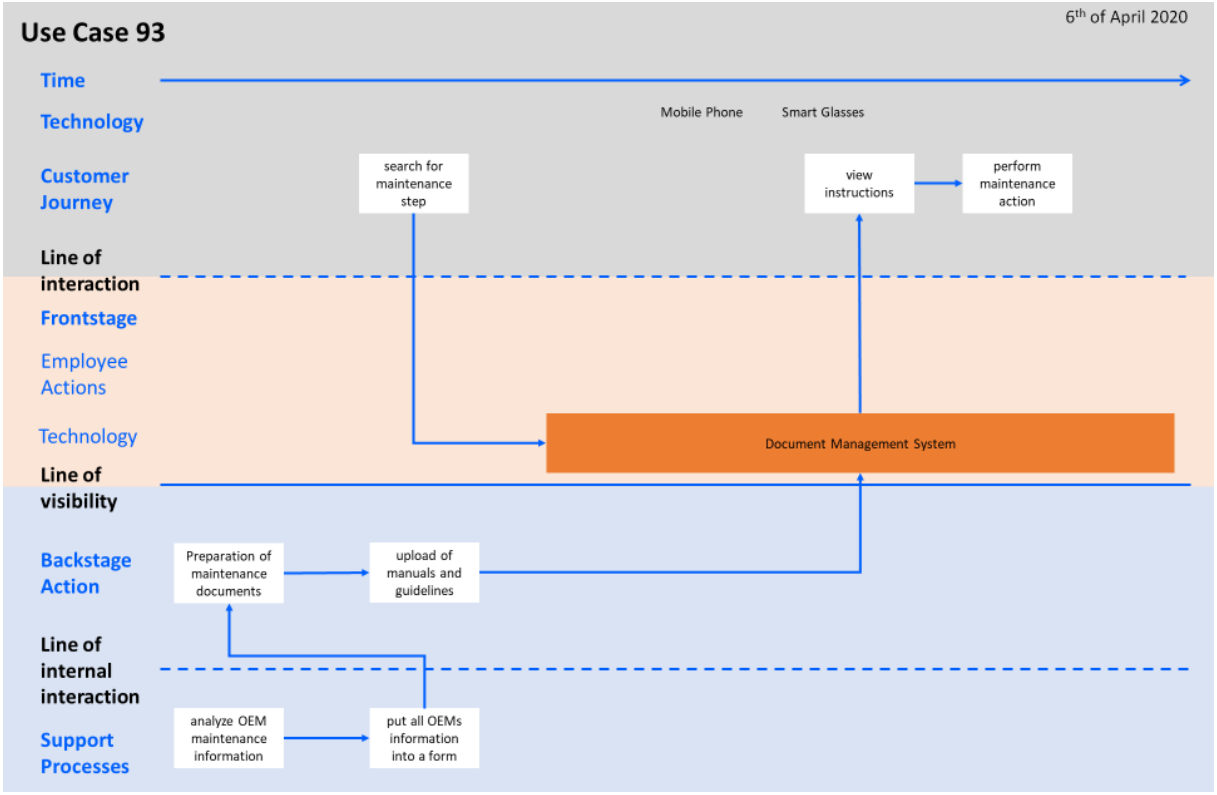
Use Case 55 – Service Blueprint



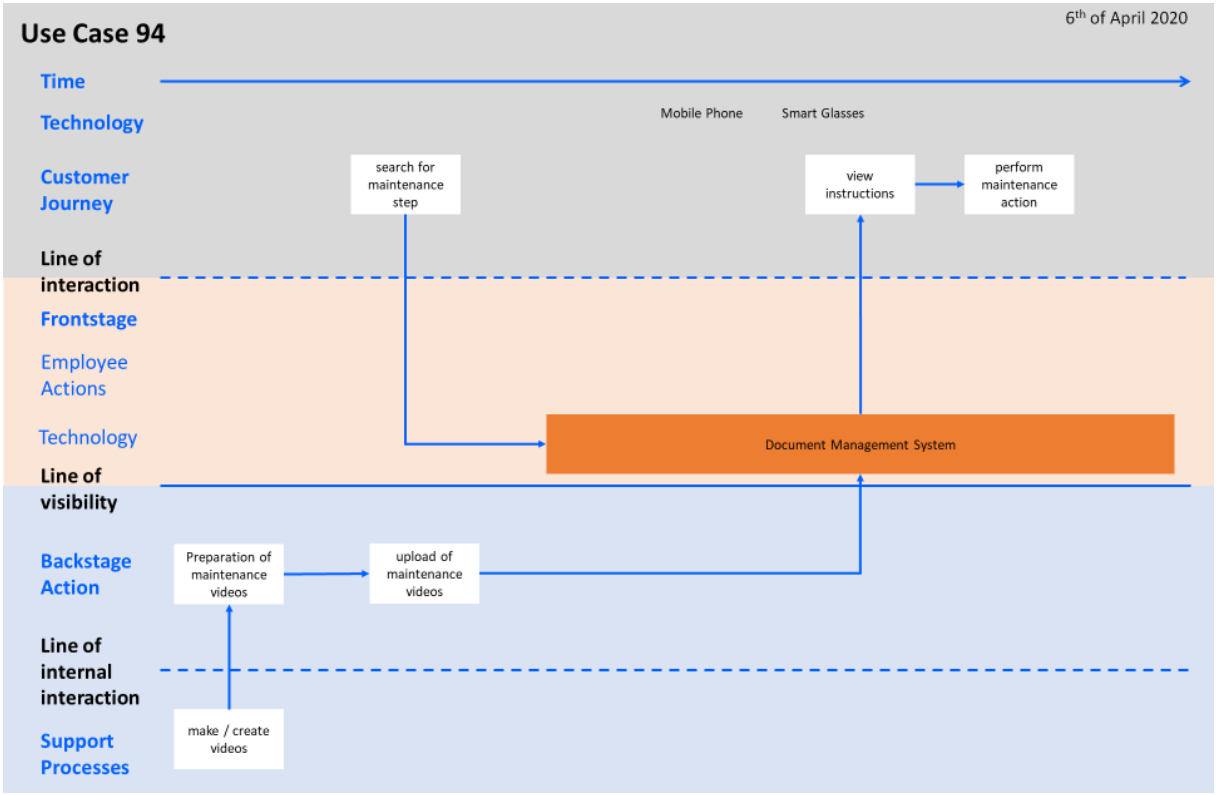
Use Case 71 – Service Blueprint



Use Case 93 – Service Blueprint



Use Case 94 – Service Blueprint



APPENDIX C: Prototyping of Solution Formulary

CONSOVEYO
KÖRBER SOLUTIONS

DISCLAIMER
Please fill only the white cells, the blue are filled automatically, if still in doubt, please read the 'HOW TO USE' tab for further information.

USE CASES FORM - OCULAVIS SHARE

UC ID	UC0001
UC Name	Insert here a name
UC Type	Select Item
Description of UC	Insert here a brief description of the case
Primary Technician	Select Technician on Site
Source of utilization	Select Item
Source System	Select Item
Internet	Select Item
Secondary Technician	Select Remote Technician
Source of utilization	Select Item
Source System	Select Item
Internet	Select Item

Company	Date (dd/mm/yy)	Call attempt (min)	0	Glasses
Select Item	25-Jun-20	Intervention Time (min)	0	Select Item

CALL		
Audio Quality	Select Item	Insert a comment here!!!!
Video Quality	Select Item	Insert a comment here!!!!
Image/Video Resolution	Select Item	Insert a comment here!!!!
Internet Connection	Select Item	Insert a comment here!!!!
Overall call quality	Select Item	Insert a comment here!!!!

GLASSES		
Ease to upload documents	Select Item	Insert a comment here!!!!
Ease to access documents	Select Item	Insert a comment here!!!!
Ease to access photos and videos	Select Item	Insert a comment here!!!!
Ease to make Calls	Select Item	Insert a comment here!!!!
Ease to answer Calls	Select Item	Insert a comment here!!!!
Ease to access contacts	Select Item	Insert a comment here!!!!
Ease to consult cases	Select Item	Insert a comment here!!!!
Ease to connect to internet	Select Item	Insert a comment here!!!!
Ease to log in	Select Item	Insert a comment here!!!!
Ease to change language	Select Item	Insert a comment here!!!!
Write a text/comment	Select Item	Insert a comment here!!!!
QR Code reader	Select Item	Insert a comment here!!!!
Ease to use voice comands	Select Item	Insert a comment here!!!!
Glasses Screen: Video Quality	Select Item	Insert a comment here!!!!
Glasses Screen: Video Focus	Select Item	Insert a comment here!!!!
Glasses Screen: Video Stability	Select Item	Insert a comment here!!!!
Comfort using	Select Item	Insert a comment here!!!!

PLATFORM		
Ease to upload documents	Select Item	Insert a comment here!!!!
Ease to access documents	Select Item	Insert a comment here!!!!
Ease to access photos and videos	Select Item	Insert a comment here!!!!
Ease to make Calls	Select Item	Insert a comment here!!!!
Ease to answer Calls	Select Item	Insert a comment here!!!!
Ease to consult cases	Select Item	Insert a comment here!!!!
Ease to connect to internet	Select Item	Insert a comment here!!!!
Ease to access contacts	Select Item	Insert a comment here!!!!
Ease to plan a call	Select Item	Insert a comment here!!!!
OVERALL USE		
Can Make/Made my work easier	Select Item	Insert a comment here!!!!
Can Make/Made my work faster	Select Item	Insert a comment here!!!!
EXTRA COMMENTS		
Insert any extra comments here!!!		

ATTENTION!!! PLEASE FILL IN ALL THE COMMENTS OR THE FORM WILL NOT COUNT OR BE SENT!!!

SAVE

APPENDIX D: Customer Journey Map

Use Cases

Journey Map

Use Case: Create a New Case

Persona: Pedro - Maintenance Supervisor, 32 years old

STEPS	Log in into the Web Platform	Access the Cases Icon	Click the 'New Case' Button	Input Case Details	Upload necessary documentation for the Case
OBJECTIVES	Easy log in into website platform with email / username and password	Access the Cases Menu to create a new one	Click the 'New Case' button displayed on the top right of the screen.	Input Case name, details and participants	Upload the documents needed on this specific Case
ACTIONS	Pedro accesses the website platform and validates login with his email and password	Pedro selects the Case icon to access all the cases in the Case Menu	Pedro Creates a new case using the 'New Case' Button	Pedro inputs the Case Name, purpose, details and participants.	Pedro creates files to organize the cases and uploads documents necessary, one by one.
COMMENTS	The user must validate the log in information every time he accesses the platform	The user must access the Cases Mnu to create a new Case	-	A window pops up with the fields to be filled with the details and participants and their permissions	Once the files are created the user needs to upload the documents, but it is not possible to select multiple files meaning the user has to upload one document at a time.
USER EXPERIENCE	Intuitive / User Friendly Setup	Intuitive / User Friendly Setup	Intuitive / User Friendly Setup	Intuitive / User Friendly Setup	Intuitive / User Friendly Setup but requires a lot of repetitive work / non-productive time

Use Cases

Journey Map

Use Case: Use the Mobile Application to access Project Documentation

Persona: André - Field Technician, 29 years old

STEPS	Log In into the Mobile App	Access Company Case	Acess Documents	Access RGV Files	Access Guideline for Maintenance
OBJECTIVES	Easy log in into mobile app. Potentially with QR Code	Access Customer case where the necessary documentation is available	Access the relevant documentation needed to complete the intervention	Documents are organized into files, so he must look it up	The Guideline has the information that André needs for the Maintenance of the Machinery
ACTIONS	André opens the mobile application and it is already logged in	André selects the relevant customer case to access all documentation previously uploaded for this case	André Clicks into the "Document" icon of the Case	André finds the RGV files	André Accesses the files and finds the Guideline so he can clarify a doubt he has regarding the maintenance
COMMENTS	Once a user logs in for the first time in a mobile application the mobile app will retain login details for this user.	Documentation is uploaded for each case and not for each customer meaning that is necessary to upload the documents to every new case	Access the documents is easy and searching capability will depend on how the documents are uploaded	-	-
USER EXPERIENCE	Intuitive / User Friendly Setup	Intuitive / User Friendly with search function available	Intuitive / User Friendly Setup	Intuitive / User Friendly Setup	Intuitive / User Friendly Setup and easy to read the document

Use Cases

Journey Map

Use Case: Use the Smart Glasses to call the Maintenance Supervisor

Persona: André - Consoveyo Technician, 29 years old

STEPS	Connect Glasses to internet	Login into Application	Call the Maintenance Supervisor	Use the glasses to solve problem
OBJECTIVES	Connect the glasses to an internet source so he can use all the functionalities and call Pedro	Access the Oculavis Share application and login in order to do the call	Call Pedro to ask for support on the intervention	Use the glasses so he can continue to work and have access to different information and support
ACTIONS	André accesses connection menu, goes to wi-fi option, selects a source and connects to it	André uses the voice commands to enter the application and uses his mobile app to generate a QR Code and login	André says Pedro's name, the app asks if he wants to cal Pedro and he answers 'YES' and the call starts	André uses the glasses while in a call with Pedro and he can access documentation, take screenshots, record a video and receive information / orientation from Pedro. André can also see any text or information added on the video / screen by Pedro
COMMENTS	Not so easy to acomplish because the voice commands do not work or / and the text function is not easy to use, making it hard to fill in the password	Login with the QR Code is easy and fast. If needed to do the login manualy it is harder because the text function is hard to use and takes a lot of time	The user must know how the name of the Supervisor is on the platform. He can access the contat list and choose from there to call the Supervisor	The functionalities available are not so easy to use because André has a Portuguese accent and the voice commands are in Brazilian Portuguese. If the internet connection is not good the call is bad or simply the glasses end the call. The resolution of the video is very good, but the screen is too small.
USER EXPERIENCE	Intuitive / Not User friendly to connect over voice command	Intuitive / User Friendly Setup / Fast login with QR Code	Intuitive / User Friendly Setup	Voice Recognition capability is limited, different accents are not recognized by the glasses

Use Cases

Journey Map

Use Case: Use the Smart Glasses to call the Project Design Team

Persona: Mario - Commissioning Engineer, 35 years old

STEPS	Connect Glasses to internet	Login into Application	Call the Project Designer	Use the glasses to solve problem
OBJECTIVES	Connect the glasses to an internet source so he can use all the functionalities and call António	Access the Oculavis Share application and login in order to do the call	Call António to ask for support on the intervention	Use the glasses so he can continue to work and have acess to different information and support
ACTIONS	Mario accesses connection menu, goes to wi-fi option, selects a source and connects to it	Mario uses the voice commands to enter the application and uses his mobile app to generate a QR Code and login	Mario says António's name, the app asks if he wants to call António and he answers 'YES' and the call starts	Mario uses the glasses while in a call with António and he can access documentation, take screenshots, record a video and receive information / orientation from António. Mario can also see any text or information added on the video / screen by António
COMMENTS	Not so easy to acomplish because the voice commands do not work or / and the text function is not easy to use, making it hard to fill in the password	Login with the QR Code is easy and fast. If needed to do the login manualy it is harder because the text function is hard to use and takes a lot of time	The user must know how the name of the Supervisor is on the platform. He can access the contat list and choose from there to call the Supervisor	The functionalities available are not so easy to use because Mario has a Portuguese accent and the voice commands are in Brazilian Portuguese. If the internet connection is not good the call is bad or simply the glasses end the call. The resolution of the video is very good, but the screen is too small.
USER EXPERIENCE	Intuitive / Not User friendly to connect over voice command	Intuitive / User Friendly Setup / Fast login with QR Code	Intuitive / User Friendly Setup	Voice Recognition capability is limited, different accents are not recognized by the glasses

APPENDIX E: Technology Assessments Result

Technology Assessments – Website Platform

Functionality	End User Feedback
Setup	• Positive: User friendly setup. Guidance only required for initial utilization, with subsequent setup "self-explanatory".
Login	• Positive: Easy to login and setup calls. • Average 1 minutes from logging in to setup call.
Usability	• Positive: Commands and navigation are easy to use. • Negative: Not possible to upload multiple documents on a folder (will be available in the April update) • Positive: Overall functionality available. – Chats – Calls – Product information – Documentation – Etc.
Interface	• Confirmed by OCULAVIS that API for major CRMs / ERPs are under development and will be available in 2021

Technology Assessments – Mobile Application

Functionality	End User Feedback
Setup	• Positive: User friendly setup. Guidance only required for initial utilization, with subsequent setup "self-explanatory".
Login	• Positive: Easy to login and setup calls. • Average 1 minute from logging in to setup call.
Usability	• Positive: Commands and navigation are easy to use. • Positive: Overall functionality available. – Chats – Calls – Product information – Documentation – Etc. • Positive: Easy to access documentation. • Positive: No apparent change in performance from IOS to Android
Internet Access	• Negative: When internet is not available, the use of the application is not possible. • Negative: No offline functionalities are available.

Technology Assessments – Smart Glasses

Functionality	End User Feedback
Setup	• Positive: User friendly setup. Guidance only required for initial utilization, with subsequent setup "self-explanatory". • Negative: For Portuguese user, the Portuguese pronunciation is in Brazilian Portuguese, which makes it difficult with both the accent and a few terms.
Login	• Positive: Easy to login and setup calls. • Average 15 minutes from logging in to setup call.
Usability	• Positive: Good audio with clear sound. • Negative: hard to focus on the display, especially with 2 eyes open. • Negative: display becomes foggy when changing warehouse areas with different temperature. • Mixed feedback: Camera definition could be improved. • Positive: Tested in Cold environment and worked well. • Negative: Face Anonymization functionality still not available, planned for 2021. • Negative: Hard to read for glass users
Autonomy	• Positive: A test got to a full 3 hours of Battery Autonomy
Internet Access	• Negative: When internet is not available, the use of smart glasses is not possible. • Negative: Connection good or bad is decisive whether the technicians can or cannot use the glasses properly.

APPENDIX F: Adding Value to Value Captures – Research Documentation

Note that the sources' links and values were not displayed to maintain the anonymity of the sources and confidentiality of values found, but the types of sources are presented (external or internal).

KPI	Value Capture	Value	Type of Source	Note
How many % do I save using the system during a hotline call	How much do we save on a hotline call	X%	External	
		from A hours to B min (X%)	External	
		X%	External	
Average duration of a hotline call		N min	Internal	Consoveyo
Average duration till incident solved		N h	Internal	Average Aberle & Consoveyo (PLC + Eletrom)
Total number of cases		A / B / C	Internal	Aberle / Riantics / Consoveyo
How much an hour of production loss is worth		€ N	Internal	Estimation by *Name*
How much does the customer save on a hotline call (€)				
What type of employee is interested in working with new technology?	Increase quality level of employees?	Technology Talent	External	If I understood properly it talks about a company investing in being innovation-driven to attract technology talent
Are them interesting to our customers ?		X-Y%	Internal / External	Meeting with HR 22/04
How many new people does the company need to employ per year (maintenance)				
How many employees does the average customer maintenance has		N		Estimation
What is the average fluctuation rate		X%		
How much does it cost for the company to find the same people with HR measures		€ X	Internal	Meeting with HR 22/04
How much does the customre save to increase the quality level of employees (€)				

% of Satisfaction of employees	Increase employee satisfaction	X% (not standard)	Internal	Look for external sources
How many % of employees are positively affected by a new technology		X%	External	
		X% (avg of some topics)	External	
How much better happy employees work compared to not happy employees		13%	External	
		up to X%	External	
How much more the customer will gain with satisfied employees (€)				
How many % of cases a field service technician needs to be send out	Saving travel expenses	X%	Internal	Requested to Hotline team in Aberle and Consoveyo
How much of that can be saved by using the remote eyes?		X-Y%	External	
What is the average cost of sending a S Technician to a customer		€ N	Internal	Aberle
Total number of cases		A / B	Internal	Requested to Hotline team in Aberle
% Savings in travel expenses		X-Y%	External	
Savings in travel expenses for customer (€)			Absolute Value	
Time Saving	General	X% per process	External	
Cost Savings (Service costs)		X-Y%	External	
Cost Savings (Estimative by companies)		X-Y%	External	
		X-Y%		
		X-Y%		
Increased perception of hotline quality	Increased perception of hotline quality	+X%	Internal	
Increased perception of security	Increased perception of security	+X%	Internal	
Optimization of processes leadin gto machine availability	General	X% higher	External	
Training Efficiency - pg 34		X-Y% higher		Not sure if it is about augm reality glasses, confused in translation

APPENDIX G: Script for training in the platform – Technician

Technicians Training Script

Functionalities within the call:

- Record a video of the screen
- Take a screenshot
- Write on the screen
- Annotations
- Translation
- Screensharing
- Upload of documentation

Other functionality tests:

- How to start a call
- How to plan a call
- Cases
- Products

Roles:

Expert: Beatriz

Customer: Björn

Problem: we want to drink something and there are two different bottles and you need to explain which one it is. (share info about ingredients) and how to open

Problem: I have two bottles; I know what I want to drink but can't identify it.

Step 1: Send mail with problem (explain the problem, input bad photos)

Step 2: The expert answers the mail setting a time for a call

Step 3: **Create a case for the problem**

Step 4: **Assign Case to a Product (Project)**

Step 5: **The expert calls the customer**

Step 6: **The expert assigns the Call to the Case**

Step 7: **Identification of the objects**

Step 7a: ask to turn around (the bottles)

Step 7b: ask to see ingredients

Step 8: **Take a screenshot of the ingredients**

Step 9: **Translate the top three ingredients to English**

Step 10: **Start recording video of the call**

Step 11: **Keep turning around until find the due date and point at it and write the due date into the screen**

Step 12: **Tell how to open the Bottle**

Step 12a: **Point at the cap of the bottle/box**

Step12b: **Explain how to open the bottle using turn symbol**

Step 13: **Stop recording**

Step 14: Look for one ingredient while sharing screen

Step 14a: **Share screen**

Step 14b: **Look for the image of one of the ingredients**

Step 14c: **Choose a picture**

Step 14d: **Upload picture**

Step 15: Generate PDF of Case

APPENDIX H: Rules of Usage (Internal)

Körber Xpert View Rules

1. Safety first – always focus on the reality
2. A Xpert View call shall always be prioritized
3. Clear communication – use clear commands
4. Good manners – always let your counterpart finish their sentence
5. Only use the system when other tools won't help you or might take longer to solve the issue – for example: if you have a picture and are uncertain request a Xpert View call
6. The smart glasses need to be cleaned after every use – therefor see the cleaning instructions.
7. The smart glasses need to be charged after every use – in case the battery does not last long enough it is hot-swappable.
8. The smart glasses are managed and stored by a responsible person who gives them out for a signature and checks the status (overall condition, cleaning and charging) after they are brought back.
9. Every user is responsible for his actions.
10. NEVER we use the system to control people remotely. We only tell customers what the problem is, we **never** tell them how to solve it, whether we can solve it remotely or we will send someone out.
11. The smart glasses are a tool and not a toy. Therefore, they are only used when required or for training purposes.
12. The smart glasses are IT Equipment and need to be handled with care, even though they might not seem sensitive or fragile.
13. Only trained employees are allowed to use the system / application. After the training each participant will receive a certificate which is comparable to a driver's license.
14. All communication must be assigned to a case, have a purpose and all parties should be aware of that purpose

APPENDIX I: Sales Argumentation

Sales argumentation

INTERNAL

The customer will have a bigger security due to an additional feature that will increase the incidents that can be identified remotely. For this reason even if an emergency occurs the negative effects will not be as big as today.

Q: Do you have figures on how many times incidents can be solved remotely?

A: No. The solution of an incident depends highly on the failure. Therefore we cannot ensure that it will be solved remotely.

The customer will have access to a higher quality service because we gave them the possibility to have an extra communication channel with the existing hotline which will have a direct impact on the hotline performance.

Q: How will this improved hotline quality effect me?

A: It will effect you in the particular sense that the average incident identification time will be reduced.

Q: Can you guarantee that the hotline will be better?

A: No we cannot guarantee, but we expect it to be like that

KÖRBER INTERNAL USE ONLY 25-Jun-20 14

Sales argumentation

INTERNAL

The customer will save money on travel expenses because we will be able to identify more failures using Körber Xpert View and therefore reduce the total amount of required travel. Those identified failures could be solved remotely or by the customer without the need of sending out a service technician

Q: How can you be sure?

A: In average the failure will be solved remotely or by the customer, after being identified by the hotline eXpert.

Q: How much can be saved?

A: That is very individual, depending on the amount of incidents that you have and various other factors.

Q: If you identify the failure do you guide us through the incident solving?

A: No. If the failure cannot be solved remotely, the customer will be told what the failure is. If the failure can not be solved by the customer we will send out service technicians.

With the use of Körber Xpert View, customers will save money, due to less downtime, because we will be able to identify failures that otherwise would not be remotely identified

Q: What do you estimate on how many incidents this might work?

A: We do not have an answer to that question, but we expect it to have a significant influence on cost reduction to the customer.

Q: How can you be sure?

A: With an additional level of communication we expect to be able to identify more failures remotely.

KÖRBER INTERNAL USE ONLY 25-Jun-20 13

Sales argumentation

INTERNAL

The customer will save money because we will be able to reduce his downtime by using improved communication to reduce time to failure identification when the customer is calling the hotline. This includes reducing the need to send service technicians out to identify the failure.

Q: How is that done?

A: With the use of the Körber Xpert View solution our technician team will be able to work with the customer through a bi-directional audio and video communication to quickly identify the cause of the incident

Q: What is the difference between Körber Xpert View and teams/skype/whatsapp and so on?

A: The platform has a lot of different functionalities to support the identification of the failure as well as can be used to document the incidents, that the regular streaming platforms do not have.

Q: What if the system does not help?

A: If there is a situation where the system does not help and the incident cannot be identified remotely technicians will be send out.

Q: Do you ensure internet connection?

A: No. Each customer will be responsible for the connection. If the customer needs, we can advise on what our service technicians are using and what experience we do have with that system.

Q: Why is the Körber Xpert View so much cheaper than a hotline contract?

A: The Körber Xpert View is an add-on to the already existing hotline contract. It does not replace a contract. A hotline contract is a prerequisite to use Körber Xpert View.

Q: If I now do a contract with Körber Xpert View is there any hotline volume included?

A: No. The volume of calls remains the same as defined in the hotline contract, the addition is that the solution will be used if necessary, to help identifying the failure.

KÖRBER INTERNAL USE ONLY 25-Jun-20 12