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Enabling Business Transformation through Servitization: The role of Open Innovation and Collaboration Strategies in Commercial Real Estate

A multiple Swedish businesses empirical analysis

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*“Il vero viaggio di scoperta non
consiste nel cercare nuove terre, ma
nell’aver nuovi occhi”*

M. Proust

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Abbreviations:

PSS = Product-Service-Systems

IoT = Internet of Things

CRE = Commercial Real Estate

OI = Open Innovation

FTK = First To Know

IP = Intellectual Property

R&D = Research and Development

CTO = Chief Technology Officer

CDO = Chief Digital Officer

Abstract

Commercial real estate industry is undergoing some major transformations that are disrupting its traditional dynamics and imposing to companies a proactive response. Technological advancements, new business models and changing in client needs create the conditions to reorient the solutions towards a more complete customer experience by providing services aiming to solve the complex user's problems. It implies a set of totally new challenges that are related to the management of the transformation process and to the definition of collaboration ecosystems to provide the services. This research investigates in particular the role of open innovation and collaboration strategies in enabling the servitization process, understanding the main benefits and challenges of providing product-service-systems and identifying the key areas where external resources can have an impact. In this explorative study, several companies involved in the servitization process, such as commercial real estate companies, corporate real estate divisions and real estate partners, have been interviewed and analyzed in order to generate an organic and detailed framework and to meaningfully contribute to the existing literature dealing with the problem. The research demonstrates that open innovation is an enabler of the servitization process and can play a key role in shaping the company creation of services. In detail, the paper contains a description of the way collaboration strategies can address the specific challenges associated with servitization and provide the tools to maximize the opportunity creation for the companies. Additionally, the research presents a visualization of the impact of open innovation in the *Service Value Web*, showing which aspects have to be prioritized to maximize the value creation process in services and to create a strong customer experience.

Keywords: Servitization, Commercial Real Estate, Open Innovation, Collaboration, Business transformation, Product-service-systems.

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Matteo Consiglio

1) Introduction

This chapter aims to explain the background conditions that constitute the starting point for this research project as well as to determine the fundamental research objectives and questions that oriented the researcher activity. Additionally, it is explained the role of First to Know Scandinavia AB in the process and the thesis limitation and disposition are discussed.

1.1) Project Outline

This research activity has been carried out by the researcher in cooperation with the Swedish consulting company based in Gothenburg *First to Know Scandinavia AB (FTK)*, which operates as a local innovation management advisor. The company's mission is to help organizations and people to transform in order to reach their potential and impact the society in a positive way. The company's main approaches to change management practices are based on sustainable business development and value-based transformation, to impact the culture and the way business operates in solving their customer needs.

The thesis project started with various interactions with the company's advisor and inspirer Per Östling, where it emerged clearly their interest in developing long term strategies to support commercial real estate customers in their journey towards digitalization and sustainability. These interactions, alongside with some initial researches and preliminary unstructured interviews helped the researcher to identify the major trends going on in the industry and the main topics that would have represented an interesting research from the company's point of view. In detail, the servitization concept came up as one of the most interesting transformations due to the increased possibility enabled by the technology as well as the radical changes in the customer needs and requirements. Additionally, this preliminary process helped to identify the main factors that have an influence on this transformation for commercial real estate companies and, among others, the collaboration and open innovation strategies seemed to represent the greatest opportunity.

Based on that, the researcher developed an initial research proposal that met FTK expectations and, therefore, was then exploited in detail into the research questions. It summarized in a project that has the goal to provide FTK with valuable insight about the potential and the opportunities of the servitization transformation in commercial real estate and the impact that open innovation can have to facilitate companies in achieving them.

Thanks to the support of FTK, as well as the availability of their network of contacts, the researcher has been able to identify and reach several managers operating in the commercial real estate sector as well as exponents of partner companies that will play a role in supporting and creating the condition for servitization to happen.

1.2) Background

Scholars refers to servitization when dealing with transformation processes that brings companies from being pure product manufacturers to become solution providers, adding services and creating complex product-service-systems (PSS) that extend the value of their business and aims to solve complex customer's needs (Wandermerve and Rada, 1988). Several are the reasons that push companies to undertake this transformation, but they are generally concerned with the creation of more engaging customer experiences (ibid.), to improve their competitive position by establishing their advantage on more intangible factors (Hirschl et al., 2003), and to fully exploit the benefits of sustainability orientation (Mont, 2002) and the opportunities that can be created by the technological improvement (Vandermerwe and Reda, 1988).

Even if Real estate has always been considered as one of the most static and traditional industries, there are several trends and factors that have been emphasized by the digital revolution and that have deeply impacted the sector in a radical way. More specifically, the commercial real estate sector (CRE) is one of the most affected due to its business-to-business nature that tend to reflect the changes in its customer's industries. According to the Deloitte 2020 commercial real estate outlook, there are three main factors that are shaping the industry dynamics and that, therefore, needs the more immediate action by the main players: the technological impact, business model disruption and the changes in customer needs (Deloitte, 2019).

Technological innovation is reshaping the industry development, allowing the process to be enriched with a massive amount of big data that help the companies to develop strong insights. Internet of Things, digital reality and cybersecurity are other technological topics that are addressed by the report as of primary relevance in the development of smart buildings.

The disruption caused by the PropTech startups that entered in the market, combining technology with agility, is a phenomenon that has to push incumbents to re-think their business models and to re-imagine their network activities and their alliances, before they will be left behind.

The third main trend is the change in customer needs. Urbanization, globalization and the technological advancements are dramatically modifying the behavior of the customers and the accelerated pace through which innovation happens will require tenants to achieve a flexibility that traditional workplaces seem not able to offer.

One of the main consequences of the CRE transformation is that the traditional mantra is changed, moving from an exclusive focus on the location as the most important competitive factor towards a more complex one in which the location is joined by the experience and the analytics (Deloitte, 2019). Tenant experience is seen as one of the most important aspect in the development of commercial real estate not only because of the impact it will have in determining the market winners, but also due to the fact that many companies say that they don't have the necessary competencies to realize it in a good way (ibid.). Today, on-demand economy

and industry 4.0 are transforming the way physical spaces are used and consumed by the tenants, and the specific needs for agile and flexible solutions is re-orienting the key elements that potential customers value the most when selecting a workplace. Big data and analytics play a major role in providing the companies with the right and meaningful information to meet these changes while the internet of things, artificial intelligence and digital reality can represent the tools to effectively engage with customers in the digitized world.

The transformation enables totally new opportunities for CRE companies to meet these changes and remain on the edge of the industry development. In order to meet the new opportunities CRE companies have to shift towards a Real estate as-a-service model that is embodied in the development of integrated solutions and experiences that goes beyond the traditional functional use of space (Deloitte 2019). According to McKinsey & Company (2019), this model will transform the tenants into subscribers and the CRE companies into service providers that create bundles of solutions in order to anticipate the customer's needs. Many companies have seen the servitization opportunities and have started to provide new services such as co-working spaces, on demand storage and cohousing leveraging the preference of the new generations of tenants, which are far less concerned about ownership while giving so much value to the workplace experience (McKinsey & Company, 2019).

The new model is aimed to provide several benefits for what concerns the adjustments to market changes and the diversification of revenues and seems to be suitable for both boutique and multinational players (Ibid.). However, the transformation is not simple and will require CRE companies to deal with several relevant issues. One of the most relevant issue is the cultural distance. In fact, to truly embrace the transformation a shift in mentality is required to proactively see and pursue the business opportunities (Deloitte 2019). Additionally, companies need to invest in the development not only of the analytical and predictive capabilities to sense the market and quickly react, but also of the customer knowledge that is required to develop truly valuable experiences that meet the expectations of their customers (Ibid.).

Companies who intend to transform and to overcome the barriers to servitization have to look outside of their boundaries and engage in more tight and extended collaborations. That's not only because being involved in ecosystems forces companies to adopt an open mindset that enable them to better scout disrupting trends and ideas (Lutjen et al., 2019), but also because external expertise can represent the best way to create new capabilities that otherwise would be difficult to be created alone (Storbacka et al., 2013).

More specifically, in the context of the CRE industry, collaboration is seen as one of the best ways to create technology-based solutions and to make the scope of service provision broader and more tailored, allowing at the same time to spread the risks (Mckinsey & Company, 2019). In order to allow companies to enter in as many areas as possible and to make them increase the value of their solutions, collaboration will increase not only in the amount, but also in the variety of partners that will be included, ranging from investors,

infrastructure players and transport operators (Mckinsey & Company, 2018). Collaboration will provide CRE companies with the tools and the support to effectively embrace the servitization transformation.

Establishing strong cooperation with a plurality of partners and engaging in open innovation activities is seen by scholars as one of the best ways to leverage the nowadays transformation of industries and to sustain the competitive position of companies. According to Chesbrough (2011), there are several ways through which servitizing businesses can use open innovation to improve their service offering and the core theme is to place the customer at the center of the process. In an open innovation perspective, the customer is seen not just as the goal of the service business, but also as a powerful partner that have to be understood and brought into the innovation dynamics of the company (ibid.).

1.3) Research Purpose

The main goal of this research is to understand what role can open innovation and collaboration strategies play in the servitization transformation of Commercial Real Estate companies in order to allow them to respond to the industry changes and keep delivering value to the customer. CRE is an industry that is undertaking deep transformations that involve a great shift in the way solutions are created and delivered to their customers and therefore it is in the interest of the author the exploration of the opportunities generated by open innovation to create and deliver services in this industry.

The main findings that this thesis has the aim to produce are the explanation of the potential options and benefits that are associated with the servitization transformation in commercial real estate companies, as well as the challenges that may emerge that may emerge during the implementation journey and that need to be overcome. Also, the research has the goal to highlight the best opportunities that can be brought to life in the servitization process by increasing the level of collaborations in the industry and applying open innovation strategies.

The research wants to provide both theoretically and empirically relevant insights on whether there is space for a more open and cooperative approach for CRE companies in this business transformation that is happening and what that space will most likely be according to the needs, the opportunities and the challenges that firms are facing in the process.

1.4) Research Question

Considering the elements stated in the background, the main purpose of the research and taking into account the FTK interest in the definition of the opportunities and benefits of adopting an open approach in the servitization transformation of commercial real estate companies, the research question that better address the identity of this project is:

RQ: “How can Open Innovation provide strategic advantage in the transition towards servitization for Commercial Real Estate companies in Sweden?”

To answer this research question may be challenging due to the different perspectives that may be adopted by Swedish firms when it comes to open innovation and collaboration as well as due to the earlier stage of the servitization transformation for most of the realities in the industry. Therefore, several sub-questions have been formulated in order to decompose the main one and to facilitate the process of answering:

Sub 1: “Which opportunities can be created by servitization for commercial real estate companies?”

Sub 2: “Which are the main challenges associated with servitization in the commercial real estate industry?”

Sub 3: “Which benefits can open innovation and collaboration activities provide in the commercial real estate servitization process?”

Sub 4: “How can open innovation increase the value creation of services in the commercial real estate industry?”

The first two sub-questions are oriented through the analysis of the servitization process for CRE companies, aiming to highlight the main opportunities and benefits that push companies to undertake the transformation and the most relevant challenges and barriers that such companies have to face in order to successfully develop a product-service oriented business model.

The third and the fourth sub-questions are related to the collaboration and open innovation activities. In particular, the third one has the goal to understand the benefits of networks and ecosystems for commercial real estate companies to address the main issues in the transformation process, while the fourth one aims to discover the benefits of open approaches to create and develop services that drives more value for their customers.

1.5) Research Boundaries and Limitations

This research work presents some major limitations that can harness the generalizability and replicability of the results. Among all, the main limitations factors can be referred to three main areas: Process, Object and Strategy.

For what concern the process, these factors rely to the conditions under which the research has been carried out. First of all, the geographic area has been limited to Sweden, which may prevent the truthfulness of the results in other countries due to cultural and societal differences. Additionally, the interviews have been conducted in English, that is not the primary language of the interviewees nor the interviewer. It may have caused some misunderstanding and/or the incompleteness of the expressed concepts. The time constraint has been an additional factor of influence, because it prevented the researcher to reach a higher number of companies and interviews, which may have increased the value of the findings and generated some other aspect that has not emerged.

Lastly, the COVID-19 outbreak has to be considered also an important factor of limitation for two main reason. On one hand, it made more difficult for the researcher to reach and schedule the interviews and meetings, due to the extraordinary circumstances in which the target companies and professionals had to operate. On the other hand, the pandemic forced the researcher to carry out the interviews with digital tools which, although their quality and reliability has been very high, does not represent an identical alternative to the face-to-face interviews due to the lack of personal interaction between the actors.

The “object” refers to the topic of the research, which can be summarized in the servitization of commercial real estate and the role of open innovation and collaboration strategies in such process. Two major considerations have to be expressed. The Commercial Real Estate industry has always been very reluctant to change and, even if the companies are aware of the transformation going on and are prioritizing their own initiatives, their culture and their dynamics are still oriented to the conservation of the status quo, which made more difficult for the researcher to engage in discussions about radical or disruptive innovations.

A second consideration is related to the relative novelty of open innovation. This concept has not been extensively explored and this is particularly true in the Real Estate environment. For this reason, the researcher encountered difficulties in understanding the processes and priorities of companies when dealing with open innovation and external collaborations activities.

The third category is related to the chosen research strategy, which in this case is the qualitative one. A first problem of this type of research is the excessive subjectivity. In fact, the opinion of the researcher about the relevance of the findings and their categorization in the thematic analysis can be influenced by the researcher itself. Additionally, the limited number of cases can generate a problem in terms of generalization of the

results. Even if the researcher took into account several different perspectives not limiting the interviews to traditional commercial real estate companies, the limited amount of the interviewees can be not representative of the entire population of available information.

1.6) Thesis Disposition

The Mater Thesis, in addition to the abstract, the acknowledgements, the bibliography and the appendix, is structured in six main chapters:

1. Introduction
2. Literature Review
3. Methodology
4. Empirical Findings
5. Data Analysis
6. Conclusions and Recommendations

The introduction has as its main role to conceptualize the theoretical and empirical starting point of the research, analyzing the main trends and background related to the topic of analysis. In this chapter, the research purpose and the research question are explicated and justified, and the reader is provided with the needed information to understand the role of this research, its main limitations and its structure.

The literature review has the goal to describe the main theoretical frameworks related to the topic of interest and, therefore, to build a background for the empirical analysis. In detail, the chapter will describe the concept of servitization and its main drivers and barriers, as well as the most relevant perspective when it comes to the transformation process of companies, involving the value structure, the processes and the sources for capability development. Finally, there is an analysis of the open innovation concept and dynamics, which includes also the role it can play in the service sector.

The methodology part describes the most relevant choices of the researcher about the way the thesis has been structured and performed. The research strategy and design selection has been discussed as well as the data collection plan has been extensively described, providing the reader full information to understand the process of data generation. In this chapter is also discussed the data analysis methods, in order to increase the transparency and therefore to mitigate the risk of subjectivity.

The empirical findings chapter provides a description of the main outcomes of the interviews, which has been categorized by interviewee. The goal of this part is to expose the outcome of every interview to allow the

reader to understand deeply the single perspectives of the topic, as well as to build a solid and homogeneous dataset for the analysis.

In the data analysis, the empirical findings have been analyzed according to the thematic analysis and connected to the literature framework to comply with the process of theory generation. The goal of this chapter is to create a deep understanding of the data and to generate meaningful insights in order to provide an answer to the research question.

In the last chapter, the conclusions, the answer to the research question is made explicit and linked with the problem description in the background. Additionally, some recommendations have been provided for what concerns the theoretical and managerial implications and the future research prospects.

2) Literature Review

This chapter aims to provide an introduction about the main theoretical framework that are related to the topics of interests. In detail, the main covered areas go from the definition of servitization and Product-service-systems, to the transformation and implementation process, alongside with the main perspective on the capability requirement and development. Finally, the concept of open innovation will be discussed, analyzing its features and benefits, as well as its implication in services.

2.1) Servitization of businesses

This paragraph will introduce the concept of servitization of manufacturing firms as it was discussed in previous literature. Then it will dive into the main characteristics of the “servitized” offer, understanding the main drivers and the different approaches that have been discovered and analyzed in order to implement it. Finally, the end of the paragraph will try to analyze which are the main challenges that companies have to face while shifting from product to PSS.

2.1.1) Main definitions and concepts

With the terms “Servitization”, literature generally refers to the transformation of manufacturing companies that shift from only producing and selling products, to increasingly integrate them with a set of bundled services (Roger, 2009). The term was firstly coined by Wandermerve and Rada in 1988, when the authors described this activity as a way for manufacturing companies to add value to their business by adding services beyond the post-sale maintenance (Wandermerve and Rada, 1988). The phenomenon has been extensively studied by scholars in the recent years and this, even if there are evidence regarding the existence of “servitization shifts” that goes back to 150 years (Schmenner, 2009), demonstrates a growing interest in these kind of strategies by Academia, businesses and institutions. One of the reasons that explain this could be identified in the various set of new and innovative capabilities that servitization implies, that are considered more sustainable and easier to protect from competition, therefore constituting a more solid base for competitive advantage (Wilkinson et al., 2009).

The great variety of application of this concept and the radical impact it can have on the ways companies create value and perform their operations have made this topic investigated by a wide range of academic traditions, each one providing unique points of view. There can be identified four main strands of analysis: Service Marketing, Service management, Operations management and Service science (Baines et al., 2009). From a marketing perspective, research have evolved from a trade and commercialization of products, like the 4Ps framework (Kotler, 1967), to a literature more centered around the concept of relationship marketing, with a key role played by the service provision (Baines et al., 2009).

In terms of management literature perspective, this has evolved towards a focus on service organizations and organizational culture (Baines et al., 2009). Many Authors have contributed in recent times to this shift, such as Heineke and Davis (2007), that discussed about the emergence of service management and its need to overcome the traditional operational management systems, as well as Machuca et al. (2007) that did an overview of the state of literature of this topic.

For what concerns operation management, a series of authors started to focus on the strategy and operations for product and services combinations delivery, such as Baines et al. (2007), that focused a lot on the concept of *integrated product and services*, and Tukker (2004), whose primarily concern was the description of different product and services level of combination.

Service science is an area of analysis that developed from the information systems domain and its primary focus is related to the understanding of services as a complex system of several interconnected actors (Chesborough and Spohrer, 2006).

One of the main reasons of a so diffused and interdisciplinary interest is the link that have been found between the creation of a more service-oriented offer and the reach of a more sustainable competitive advantage. According to Mitchell (2004), the servitization, defined as the integration by manufacturing of services to their offer, in order to enhance customer value beyond and based on what they already provide, is one of the business model innovation breakthrough moves that will most likely create a strong and resistant competitive positioning.

2.1.2) Product-Service-Systems

Having described the main theoretical definitions, now it's important to understand how the concept of servitization translated into the business model of manufacturing firms. This transformation is taking place in many different sectors at global scale, forced by a different intensity of competition and the rise of ever-changing customers (Wandermervé and Rada, 1988). There are several practical examples of companies that have integrated some sort of service offer in their package in order to reach a wide range of goals, but mainly to increase their customer value proposition.

One of the first cases taken into account by the literature was the way American Express was set to become more than a merchant by providing extra services using direct mails (Wandermervé and Rada, 1988). Additionally, manufacturers have started to increase dramatically the extend to which they provide services (ibid.). One of the pioneers in this area has been Rolls Royce, with its registered trademarks of "Power-by-the hour" and "TotalCare". With these contracts, the company do not sell the ownership of the gas turbine engine to its customers but lease it, keeping strong contact with its assets and with all the data that they can collect and use to improve their operation and their offer (Baines et al., 2007).

To better understand the impact of the servitization theory on the business models of manufacturing companies under the perspective of offering *bundles* of product and services, many authors have developed the concept of Product-Service-System (PSS). In detail, the first authors that proposed this concept were Goedkoop et al. (1999), that defined this concept as the system of product and services that has the goal to provide the customer the functionality he needs in a more sustainable way. In detail, the author described it as the combination of three elements:

- Product: a manufactured element that is sold to solve users' needs
- Service: an activity that has commercial value
- System: a bundle composed by several elements and their interactions.

Other authors have given their contribution over the years to increase the complexity and the deepness of the concept of PSS, enriching it with several different perspectives. Mont (2001) focused on the aims of the servitization shift stating that the PSS is designed to provide more competitiveness to the offer of the firm and to lower the distance between producer and customer. Manzini (2003) oriented his analysis on the innovation activity that is behind it, understanding the substantial shift from the “one and only” solution, to the system of solutions for the user's problems.

The system of product and services has some peculiar characteristics that makes it really far from the usual business of manufacturing firms. PSS can represent an evolution of the product identity that was previously intrinsically linked with the material world to a new state where the material component cannot be separated from the service one (Morelli, 2003). Another perspective on this matter is described by Baines et al. (2007), taking into account that in this new context the main focus becomes the sale of the usage, instead of the sale of the ownership.

Another important aspect that has been investigated by the academics is the link between PSS and sustainability. In fact, in order to be successful, a PSS has to be designed at a systemic level involving the customers from the earliest stages, increasing the degree of stakeholder's engagement in the process (Mont, 2002; Manzini et al., 2001).

Additionally, PSS solutions are often seen as to have strong positive impact on the environment due to the focus on asset utilization rather than consumption and could alleviate the environmental pressure over economic growth (Tukker, 2004).

2.1.3) Main Drivers of Servitization

The reason why companies tend to shift from pure manufacturing to a combination of product and services offers has generally been linked with the search for a more sustainable reach of competitive advantage. More in detail, there are several aspects of a firm's operations and goals that can be affected and improved in this new paradigm, and there have been an extensive set of literature that have tried to analyze the different drivers to move towards PSS. After a careful review of theoretical analysis in this sense, there have been identified four major areas that comprehend the major benefits and changes that companies tend to embrace through servitization: *Marketing and customer centricity*, *Strategy*, *Sustainability* and *Technology*.

The first main driver that has been analyzed by scholars is the role of customer centricity and, in a broader view, the marketing implications that are interested. According to Vandermerwe and Rada (1988), the greater availability of information lead customers to demand a greater amount of services, in addition to product, to obtain a more complete and integrated solution. This phenomenon led also to an increased demand of customization (ibid.). Due to the greater flexibility of the service component, the customization need is more likely to be met and, additionally, always new functionalities could be added in order to better satisfy those changing customers constantly (Baines et al., 2007). Other scholars focused on the impact on how the value is created and perceived by customers. Woodruff (1997) created a debate between the concepts of “embedded value” and “value-in-use”, while Vargo and Lusch (2004) stated that value is perceived by customers during the utilization phase of a good and not embedded in it. For this reason, the process of co-creation of value with customers and suppliers receive an important consideration due to the reduced distance from the company to where the value is actually created. Consequently, firms that aim to be successful have to recognize the importance of establishing strong and routinized customer relationships (Levitt, 1983) and need to understand and prioritize the analysis of all the challenge that are originated by this new level of intimacy with the market (Galbraith, 2002). To summarize, servitization makes the companies to shift their effort from bringing the customers into the stores to buy the products, to find ways to get the goods into their houses (Vandermerwe and Rada, 1988).

Under the strategy perspective, a first step in the literature has been the identification of the integrated strategy as an imperative for the strategy in the capital goods market, requiring a great development of knowledge about the customers (Davies, 2004). There are several strategic advantages in relation to the market competitiveness of firms that have been highlighted by Vandermerwe and Reda (1988). In detail, servitization strategy can help companies building barriers to competitors (by providing services early on the acquisition process, creating more loyalty and knowledge about their needs), to third parties (by providing the services previously provided by others) and even to customers competition (by preventing possibilities for vertical integrations and diversifications). The authors have highlighted also other kind of benefits, such as the great

role of PSS in creating dependency, because of the ability of these type of offers to provide a broader set of activities for the customers creating a stronger lock-in effect (Vandermerwe and Reda, 1988). Additionally, PSS platforms allow companies to distribute new offers based on innovations that goes beyond the core business of the organization and this can help them in a re-framing activity having as object the selection of which business to be in and which ones to leave (ibid.). Another advantage is the fact that, creating value through the provision of services, is a source of competitive advantage that is more difficult to copy (Hirschl et al, 2003). This analysis has also to take into account the transformation journey and the way it shapes according to existing strengths. In fact, evidence has shown a greater tendency to effectively implement servitization from companies with lower relative manufacturing strength with respect to the relatively stronger ones (Schmenner, 2009).

Sustainability is a topic that is increasingly taken into consideration by companies and government when it comes to planning future development. In this context, due to either the reduction of goods and material production, either the increased responsibility of producers through services like recycling or take-back, it can lead to a reduction in global waste (Mont, 2002). Additionally, it has been investigated the possibility to produce social outcomes too, due to the increase in revenues originated by the service business that can create new jobs and balance the growing manufacturing jobs loss (Mont, 2002; Manzini et al., 2001). The moving of firms towards PSS systems is also supported by government that, dealing with public pressures on environmental issues, supported the research on that topic (Baines et al, 2007).

Technology has the potential to reshape the nature and dynamics of competition, transmitting the outcomes to strategy and operations (Porter and Heppelmann, 2015). Technology enables firms to exploit and distribute services instantly and, with the potential of the new interconnected systems, has better chances to deliver them directly in the homes of the customers (Vandermerwe and Reda, 1988). Additionally, customers tend to be more interested and “less scared” about technology, which enables a great potential in providing services to them (ibid.) and, according to Bustinza et al. (2017), this potential can be exploited by several different industries. Coming into detail about the technologies, Wilkinson et al. (2009) described how the PSS adoption has been influenced by the development and innovation of transportation and communication methods. Nowadays, a great number of tools can be connected, opening the door to several service-related opportunities either reactive or predictive (Masson, 2016). Additionally, new and data-driven strategies, like the Internet of Things, can boost servitization by allowing firms to base their service value proposition directly on consumer’s data (Bustinza et al., 2017).

2.1.4) Types of Product-Service-Systems

The analysis concerning the ways companies transform their ways to do business towards a product-services hybrid way has led to the determination of different types of product-service-systems. The main idea behind almost every kind of proposed classification is the identification of which element is prevalent with respect to the other.

One typical example of a similar classification is the one proposed by Kotler and Keller (2016). This model is composed by 5 types of offers, and at the two boundaries we have “pure products” and “pure services” respectively. In between, the types are identified understanding which element is dominant. If it’s the product the dominant element of the offer, we refer to it as “tangible product with add-on services”, while if it’s the service component to dominate the product’s one, the offer would be categorized as “Services with minor add-on product”. In the case of no clear dominance, the offer is referred to as “Hybrid”.

Other authors have proposed a different classification for PSS offers. Even if the main idea behind it is similar (i.e. the flow from pure product to pure service), the main difference lies in the identification of the objective as the main classification criteria, instead of the one of dominance adopted by Kotler. The three main PSS categories, as shown in **Figure 1**, are: *Product-Oriented PSS*, *Use-Oriented PSS* and *Result-Oriented PSS* (Manzini et al., 2001; Tukker, 2004; Baines et al., 2007).

The first category, the product-oriented PSS (PoPSS) has a business model that is based on the product, with some services that complete the offer (Tukker, 2004). In fact, it is mainly characterized by the prevalence of the product offered, and by the presence of surroundings services whose main role is to improve the functionality of the product itself (Manzini et al., 2001).

The service component of this kind of offer has been divided into two main components by Tukker (2004). The first part is composed by all the *product-related* services, that aims to better use the product itself. In this case the producer sells services such as maintenance or take-back schemes. The second part is composed by *advising and consultancy services*, whose aim is to better clarify the most effective use of the product.

In the second category, the Use-Oriented PSS (UoPSS), the business model is still centered on the product, but it is not oriented to selling it, due to the ownership rights remaining to the producer (Tukker, 2004).

This kind of offering places itself in the middle of the range between pure products and pure services, and it can be exploited in three ways (ibid.). The *product lease* is the first opportunity for this kind of PSS, and it consists on a lessee that pays regular fees for the use of the product and the owner that is in charge for maintenance activities (ibid.). The second possibility is the *product renting or sharing*, where the owner plays the same role in the product lease, but the use is not limited to only one user (ibid.). In case of *product pooling*, that is really similar to the previous type, the key element is the simultaneity of usage between users (ibid.).

The Third category is composed by the Result-Oriented PSS (RoPSS), where the customer and the provider basically trade a result to a problem or a need, and the involvement of a product as a medium to reach it comes only afterwards (Tukker, 2004).

The three ways this PSS is divided into by Tukker, (2004) have in common the action of the producer company to directly deliver the solution to the customers (Baines et al., 2007). The first type of activity is the *Activity management or outsourcing*. In this context, the company sells on of its activities to a third party, that agrees on the expected outcome. The second kind of activity is the *Pay per service unit*, where the payment is due for the usage of the product. The third category is the one of *Functional results*, that differ from the first due to the complete freedom of the provider to decide how to deliver the result.

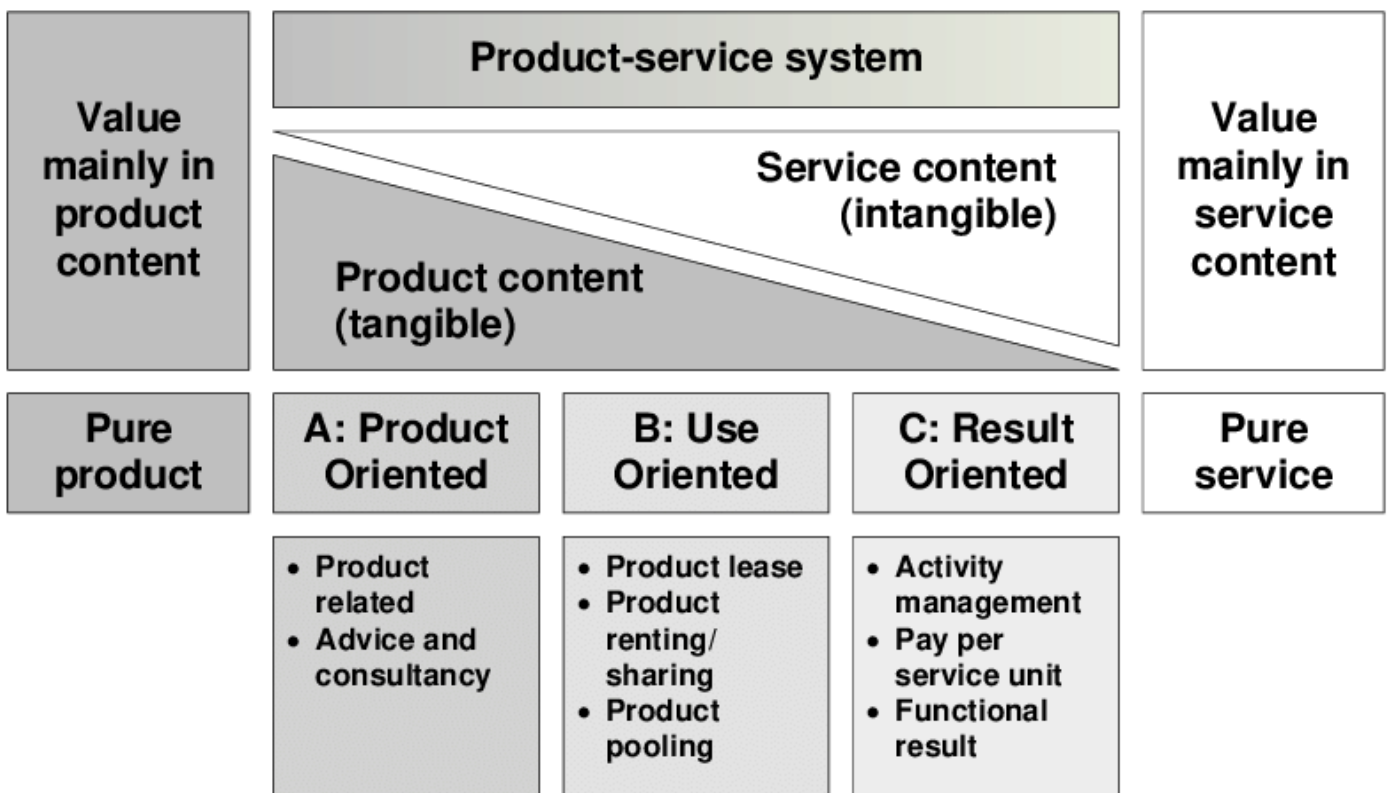


Figure 1: Product-Service-Systems. Source: Tukker, 2004.

2.1.5) Challenges and Barriers of servitization.

The adoption of a servitization perspective and the commitment to the development of an effective PSS type of offer is challenging, because it has to face several and diverse cultural and operational challenges (Baines et al., 2007). Navigating through the existing literature, what emerges is that the main barriers for companies aiming to servitize are present in both sides of the business. In fact, we can highlight two main categories of challenges: external-related (i.e. the customers) and internal-related (i.e. the transforming company).

For what concerns the first category, several authors such as Goedkoop et al. (1999), Manzini et al. (2001) and Mont (2004) explained how the main challenge for the effective commercialization of a PSS is the cultural change that is needed by the customers when it comes to place value on services rather than on products. The main obstacle in this process can be identified in the fight between use and ownership: customers have to place value on having a solution for their needs, and not on the possession of a product (Baines et al., 2007).

However, this perception may have changed over time, due to the different country's culture, as stated by Wong (2004), or to the recent development and performance of the sharing economy (Hamari et al., 2015; Zervas et al., 2017).

The second category involves all the obstacles that companies have to face internally in order to see and exploit the opportunities that exist in the PSS domain. This type of barriers is more complex because it involves several corporate dynamics and, for instance, requires a further subdivision.

The first type of internal barrier can be identified in the “*Service Paradox*”, as defined by Gebauer et al. (2005). The paradox describes a situation where the manufacturing company is not able to transform into a service provider, in the sense that the returns and the gained market share do not grow as expected by the level of investments (Gebauer et al., 2005). This situation can lead to financial crisis and is originated by the inability of the manufacturer to succeed in the service business and overcome its complexity due to the higher cost that are incurred and the variability of the returns (Neely, 2008).

A second barrier is represented by the distance between products and services, in terms of the structural differences between these two types of offers and the corporate implication that derives. Services are not tangibles as product are, and they differ from each other when it comes to variability, inseparability and perishability (De Brentani, 1991). Additionally, another important difference involves the type of work activities associated. In services, the producer works closely and tailor the offer to the customer, that therefore plays a key role, while in pure manufacturing the work is essentially on the product (Hill, 1999). It creates consequences in terms of cultural readiness, because many difficulties may originate from the need to create service-oriented mentality (Gebauer et al., 2008) and to the conflict that it may have with a pure manufacturing mentality (Bowen et al., 1989). Another consequence that could be originated is an increase in the resistance

to change inside the company, due to the fact that a shift in priorities may put some parts of the organization in the position to lose power (Kotter et al., 1989).

A third level of barriers concerns the internal organizational transformations that the company have to face when transforming to services and the consequent structuring of the PSS offer in a coherent way. In fact, companies are challenged to experiment new types of pricing systems, as well as to take risks that were previously translated to their customers and finally to build competence in their own departments about the process from the design to the delivery of the service (Baines et al., 2007). Also, Chesbrough (2011) discussed these kinds of challenges for transforming manufacturing firms starting from the pricing system that has to be able to confer the real value to the service component. The author then described other relevant obstacles that needed to be overcome when moving towards servitization, such as the need to adjust sales compensation incentives to make salesmen more oriented towards service-selling, or the need for new internal metrics that move away from the accounting principles and are more customer-oriented, or the importance of an effective communication to the customers in order to “educate” them on the value of services (ibid.).

The last category of corporate-oriented barriers is the increased complexity in the competitive environment the company's in. As explained by Vandermerwe and Rada (1988), servitization, alongside with other trends, has led companies to compete with a variety of different and new rivals and has made the expertise of companies in their industry a key element for their success in others, creating new and complex dynamics of competition. To explain this concept, the authors described potential situations where the manufacturing firm that moves to services has to compete with their own customers (when for example a global publisher goes into the electronic distribution market, he'll compete with the actual customers of their rights), with their suppliers, with other industries (when for example car manufacturers offer financial services to incentive purchases) and even with themselves, for example when educating customers, they may not need the product in the future anymore (Vandermerwe and Rada, 1988).

2.2) Servitization process and requirements

This paragraph will dive into the main implications for firms that are transforming towards a more service-oriented business model. The first element that is investigated is the change in the value creation process, with the introduction of the service value web. Then the various models for the transformation will be presented, with a focus on the stages that firms need to go through. After that, there will be a review of the capability required to successfully become a PSS provider, together with the different approaches that have been studied in order to obtain them. Finally, the major benefits and challenges of servitization-aiming collaboration will be discussed.

2.2.1) From the value chain to a service value web

As emerged from the previous chapter, the journey to servitization can't start without a clear understanding of the opportunities that lie beyond it and by understanding the new models of value creations associated with it. One of the instruments that traditionally have been used to portrait the linkages of the operational activities in order to determine the structure of the value creation process is the Porter's Value Chain (Porter, 1980; Porter, 1985).

As Described by Michael Porter (1985), the value chain is the framework that aims to describe the value-adding activities for firms that are the source of their competitive advantage. The model is built around two categories of activities: primary activities and support activities. The former is a set of activities that can be linked to the production phase: it starts with the inbound logistics and move toward the core operations, to finally get to the outbound logistics and the after-sale services, considering also the marketing and sales activities. The latter is composed by all the value creating activities that play a cross-stage role in the production phase, and for this reason are seen by the author as supportive for the whole value creation process. These activities include human resource management, technology development, procurement and firm infrastructure.

This framework has been used for the last decades to study firms and industries, and it has framed the way analysts look at the value creation processes within firms (Peppard and Rylander, 2006).

However, if considering a service perspective, it is evident that the Porter's Value Chain is not able to comprehend all the elements that create value and, therefore, there is the need for a different framework in order to address this issue. According to Chesbrough (2011), the value chain is mainly focused on products and all the activities described are core manufacturing ones. Therefore, the service component comes only in the after-sale part or as one of the support activities (ibid.). Additionally, when products become more and more dematerialized, the value chain becomes inappropriate to reveal the value drivers for businesses (Peppard and Rylander, 2006). For these reasons there is the need to move away from porter's value chain to a different

model that capture the real source of interactions and value creation activities: the customer (Chesbrough, 2011).

The need to shift from a view mainly based on transaction to a new one centered on customer relationships implies that the activities of the firms should be oriented to the creation of several contact points with customers (Baines et al, 2009). In this context, the companies have to approach the system-thinking instead of a product-thinking and be involved in activities that go beyond the buy-sell relation (Baines et al, 2007). In order to design an effective PSS, customers have to be engaged since the earliest stage of the process, and it needs a revision of the sequential steps of value creation (ibid.). This need has also been addressed by Ramirez (1999), who argued that in the servitization offers the value is not simply added by manufacturing activities but is co-created with the customer in an iterative process.

To aggregate the limits of the Porter's value chain and to provide an useful outcome of all these points of analysis, Chesbrough (2011) developed an alternative model that could explain in a visual way the process of value creation in a servitized business: the service value web (see **Figure 2**).

According to this model, the value creation process begins with the customer engagement, that has the goal of determining their needs. Generally, the companies want to involve customers to co-create the service, making it easier to customize it and adapt it to the specific solution demand. One of the main outcomes of these interactions is the knowledge flow between the actors. It helps companies to gain tacit knowledge that can be used in the process of future development of its offering. These steps can see also the involvement of third-party actors that can positively influence the relation with their knowledge or experience and can participate to the knowledge flow. The knowledge that has been shared and co-created represents the building blocks of the customer experience and, once that the value has been created, an integrated and comprehensive offer is delivered to the customers.

The main features of this model can be summarized in three main aspects: the customer centricity, that represent the central element of the entire value creation process, the circularity, that changes the linear paradigm of value creation into an iterative process, and the third-party centricity, that is explained by the great role of knowledge flow that involves customers and other partners in the offer creation.

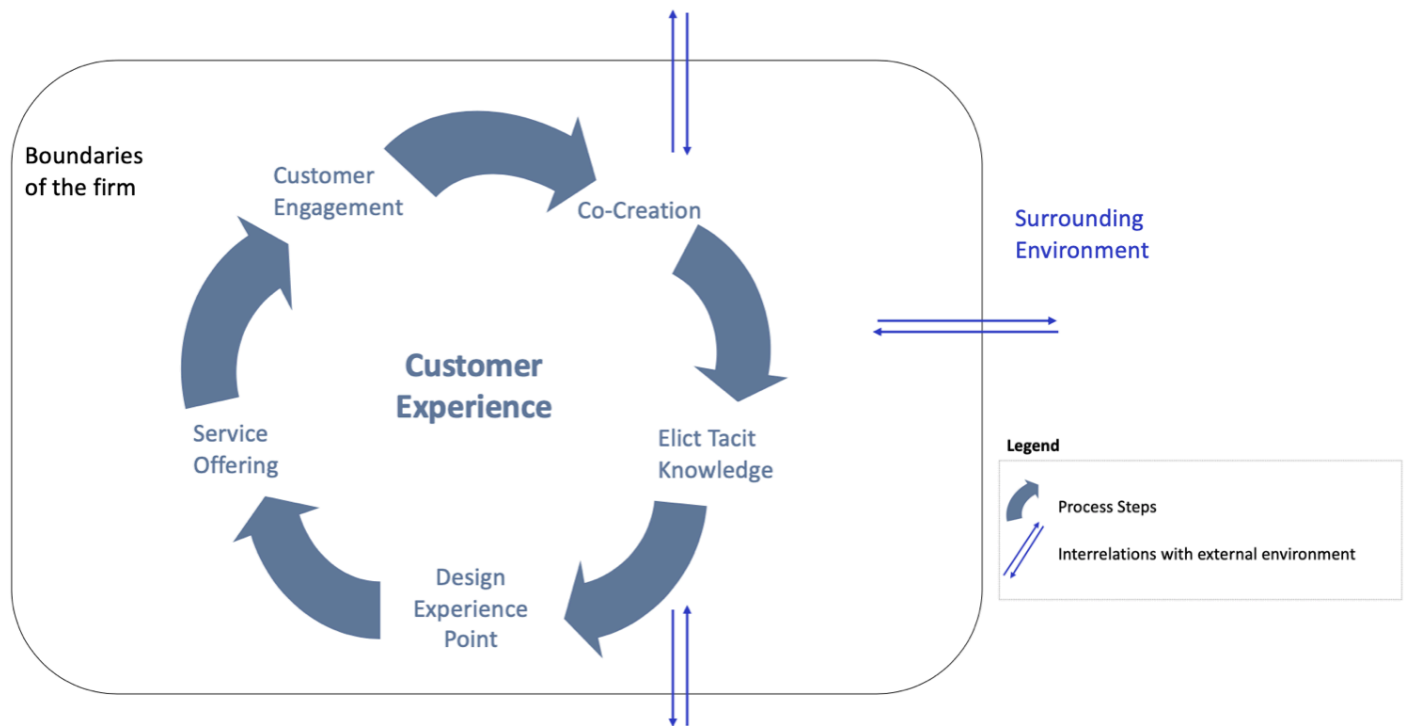


Figure 2: Service Value Web. Adapted from Chesbrough, 2011.

2.2.2) Models for the transformation process

As we've seen, the inclusion of services entails a completely new perspective on value and requires a new perspective on the key activities and the way organization deploys to perform them. Therefore, the creation of a PSS is not a risk-free move and it can affect the way companies create value for their shareholders in the short-term (Suarez et al., 2013). For this reason there is a growing interest both in management and in academia, to understand the transformation dynamics and the steps that are required in order to successfully complete the transformation, from the development of the key capabilities to the sustained exploitation of the service system (Lee et al., 2016).

One of the first attempts to describe the stages of the transformation process has been carried out by Wandermerve and Rada (1988). The authors stated that the process of creating complex product-services offers is probably characterized by three overlapping stages.

The first stage is *goods or services* and refers to the initial situation where the company is specialized and its offer and there is little or no presence of the other element.

The second stage is *goods + services*. In this step, manufacturing companies start realizing the need of combined solutions due to technological advancements while service companies explore the product as a catalyst for their services

The last stage is *goods + services + support + knowledge + self-service*. Alongside products and services, the other elements that the company adds are support, that refers to all the activities that aims to simplify the

consumer experience, knowledge, that is represented by the know-how and creativity, and self-service, that is composed by all those activities that makes the customers do the job by themselves.

Another approach saw scholars focalize mainly on the strategic intention, explaining how the servitization transformation happens in a generally unstructured way. According to Gaiardelli (2014), companies are approaching the transition in a soft way that has been described as “unstructured fashion”, and this is due, in the author’s opinion, to a lack of in-depth understanding of the different implications of PSS.

The same line has been followed by Kowalkowsky et al. (2012), who introduced the concept of “agile incrementalism”. According to the scholar, the development of value-adding services and the transformation of products into complete solution happens with no strong efforts but through a series of small steps characterized by an iterative process of implementation, modification and recalibration of activities, solutions and objectives (Kowalkowsky et al., 2012).

More recently, Baines et al. (2017) analyzed the transformation process of companies to determine the main factor that have influence in it. The scholar reviewed a framework proposed for the first time by Pettigrew in 1988 on organizational change, which identified three critical aspects that shape the way companies servitize their offer: the context of the change, the process itself and the outcomes that are expected from it.

The *context* of the change can be divided into two main aspects: the internal context, that include among others culture, leadership style and degree of trust, and the external context, that refers to factors such as politics, social situation, technological development.

For what concerns the process, it is can be viewed as a model, whose aim is to explain the causal relation between variables, as a set of techniques that shape the actions of the company or as a sequence of events.

For what concerns the outcomes, that refers to the real content of the change and to the goals that companies want to reach, they could be analyzed at a functional level, business level, company level or network level.

Based on this analysis, Baines et al. (2019) focused their attention to the process stage, trying to develop a model that could enable the description of the servitization transformation. *The Servitization progression model* identifies four major steps of the transformation process, and five main forces that can influence the transition. As illustrated in **figure 3**, the process starts with the *exploration* phase. During this period, the companies is focused towards gaining information about the potential and the implication of PSS. The second step is the *engagement*, where the promoters work to demonstrate the potential in order to get commitment from the entire organization. If the company is convinced, the *expansion* phase begins, and the firm expands its servitization projects until PSS become a relevant source of company’s revenues. The last stage is the *exploitation*. At this point the company is able to offer a wide range of PSS and these are constantly optimized and innovated.

The main forces that can influence the transition from one stage to the following are:

- *Customer pull*: market environment dynamics that shape customer needs and strategic decision of companies.
- *Organizational readiness*: internal factors such as organizational culture and power relations that affect the first stages of the process.
- *Organizational commitment*: internal factors that can influence the ability to bring the process forward, such as top management support and strategy design.
- *Technology push*: Development of service-enabling technologies.
- *Value Network positioning*: Dynamics of the ecosystem of the firm that may influence the value creation.

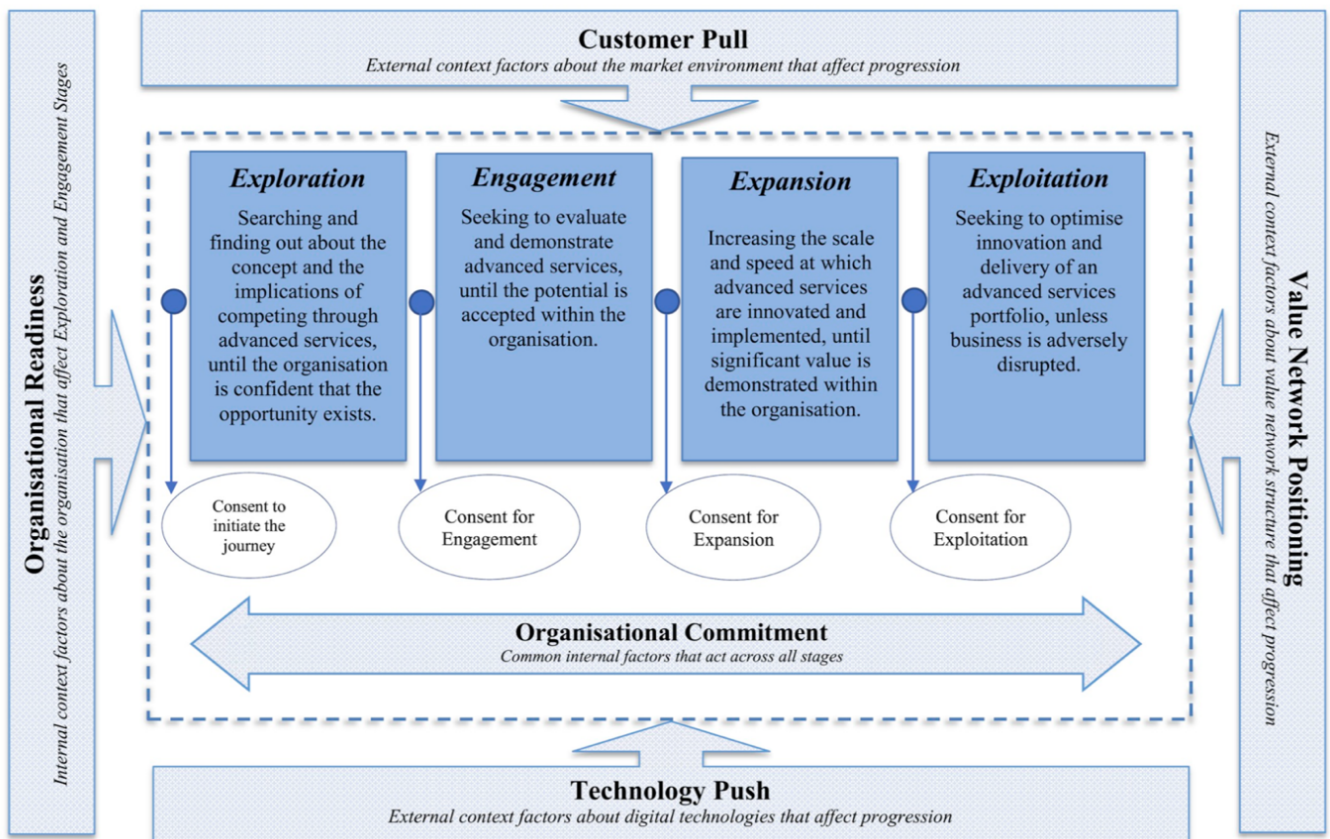


Figure 3: Servitization progression model. Source: Baines et al., 2019.

2.2.3) Capability requirements

In order to build a valid PSS and fully embrace the opportunities of servitization, companies need to acquire and develop an extensive set of service capabilities (Baines et al., 2009). In fact, there are a wide range of different types of resources and capabilities that are more specific of services and that are required either to design and deliver effective and meaningful service, either to integrate these services into an integrated offer that provide a solution to customer needs (Paiola et al., 2012).

One of the most famous approaches for determining the resource and capabilities structure that create competitive advantage for a firm is the resource-based view. According to this theory, the superior performance in the market is achieved by firms that are able to develop and maintain a set of key resources that match the market success factors, allowing the firm to perform better than competition. However, this theory has been criticized for its lack of an explanation of how firms can maintain these resources and capabilities over time, making it outdated in the context of rapid changing environments or business transformations (Teece et al., 1997). Therefore, a different and consequent theory has been developed, the *dynamic capability* theory, that defines a dynamic capability as the attitude of the firm to “integrate, build and reconfigure” the firm’s competencies in order to respond to market developments (ibid.).

There has been a lot of academic interest in the link between dynamic capabilities and servitization and, more specifically, there have been developed several frameworks that classify the capability requirements for servitization in the three categories proposed by Teece (2007) of *sensing*, *seizing* and *reconfiguring* capabilities.

Sensing is the capability of the firm to scan and gather market intelligence and meaningful insights. A first category of these capabilities related to servitization is linked to the role of customers. In fact, service innovation is more directly linked to the end-user with respect to the product one (Edvardsson et al., 2006) and, for this reason, the involvement of customers in the offer definition needs to happen earlier in the process. A second element is represented by the analysis of the entire service-system. A company that aims to offer services generally needs a set of partners and third-party actors that cooperate to develop and deliver the offer and it requires a better sensing of the entire set of actors (Kindstrom & Kowalkowsky, 2009). A third element is represented by the mapping of the internal initiatives and opportunities for the integration of product and services. According to Kindstrom and Kowalkowsky (2009), several firms started their servitization effort by ideas already existing in the company and therefore it requires a better discovery method. An additional element of sensing capabilities relies on the need to monitor the technological development, due to the strong influence of these when it comes to service innovation (Lusch et al., 2010).

Seizing refers to the ability of firms to and mobilize resources to address and capture value from an opportunity. A first issue in this context is the need for abilities that allow the company to interact with

customers and other partners. In fact, relationships skills are fundamental to engage partner and customers in co-develop and co-innovate the service, which leads to value creation (Mannervik & Ramirez, 2006). A second aspect is the service delivery, that opens a new set of challenges for previously product-focused companies. Some typical issues regard the balance between service quality and cost efficiency, the determination of the service unit's location and the outsourcing decisions (Kowalkowsky et al., 2011). Another two elements that require seizing capabilities are the setting up of a development process that takes into account the difference between products and services and the adoption of a new revenue mechanism (Kindstrom et al., 2012). The pricing system has to adapt to a context where the value of use is determined mostly by the customer conditions, rather than a material product ownership (ibid.).

Reconfiguring capabilities are needed by the firm for its continuous improvement process that has the goal to avoid the rigidity that could be developed over time. One of the first element to maintain the competitive advantage over time is to orchestrate the service system effectively, which means to reconfigure roles, resources and power in the firm's network (Lusch et al., 2010). A second aspect is more internally related, and it is a direct consequence of the transformation. In fact, there will be a need to balance the innovation assets of the two businesses due to the potential power conflict that could arise in the hierarchy of the firm (Gebauer and Friedli, 2005). A third element is represented by the cultural shift that is needed to make the transformation effective in the long run (ibid.) In detail, the core capability is the ability to produce a change towards a service-oriented mentality that helps in framing everything that happens in the firm's environment and that drives the learning processes (Matthyssens et al., 2006).

2.2.4) Capability development: internal and external perspective

The need for the development of the described capabilities is a fundamental issue for servitizing companies. Manufacturing companies tend to be solid in terms of capabilities related to technology innovation and product development but tend to lack the service-oriented capabilities needed to succeed in the new model (Neu & Brown, 2005). For this reason, a key issue when dealing with such a transformational process is represented by the selection of the source of such capabilities, that means if they have to be developed internally or acquired externally (Paiola et al., 2012).

In general, various theories tried to investigate the more appropriate situation where firms should create resources internally or use the market to get them. According to the *transaction cost theory*, the firm decision has to be based upon the asset specificity, the level of uncertainty and the frequency of transactions (Williamson, 1975). The more certain and frequent are the transactions, the more they could be externalized to the market while, in the opposite case, they should be developed internally (ibid.).

This theory involved the possibilities of intermediate solutions, such as joint ventures and alliances. Other theories however, such as the *resource-based view* and the *theory of core competencies* are much more focused on the proprietary assets that represents the source of competitive advantage and, therefore, do not consider the market as a source for them (Paiola et al., 2012). In fact, these theories state that advantage only come from key resources that, in order to be so, have to be inimitable and controlled by the firm, making it impossible to be on the market (ibid.).

When considering specifically the literature on servitization, some studies of the last decade have analyzed the topic of capability development. More in detail, according to Mathieu (2001), the development of capabilities can be seen as a line connecting the internalization, the outsourcing and everything in between, highlighting some major benefits of collaboration such as risk-sharing, better access to resources and mitigation of politics. Another contribution was the conceptualization of the *system selling*, that is the single-vendor approach that provides services by developing all the needed capabilities internally, and the system integrating, that adopt a multi-vendor approach to deliver services by integrating capabilities from various sources (Davies et al., 2007). Finally, Kowalkowsky et al. (2011) considered in their analysis the role of collaboration for the development of service-capabilities, focusing on the internal and external perspective, as well as on a hybrid model where the two other dimensions coexist.

In the moving towards PSS, the companies that follow an *internal* approach for developing capabilities tend to do it to keep control of the key elements for success (Paiola et al., 2012). Additionally, they report the creation of competitive advantage thanks to a better integration due to the low level of coordination required (Nordin, 2008). Some of the main drawbacks of the internal choice is the great number of in-door competencies which limits the specialization benefits and the higher costs of internal development.

The main advantages of the *external* approach can be summarized in the better timing efficiency and in the lower level of fixed costs, that can be an issue for companies in really uncertain markets (Neely, 2008). Additionally, to rely on external partners or providers for service-capabilities can provide two other key advantages: the opportunity for the transforming firm to focus only on its core competencies, making it benefit from the specialization, and the flexibility to reduce the scale or abandon the market if it doesn't meet expectations (Paiola et al., 2012). The most important disadvantages of this approach are the loss of control, which is really dangerous for strategic areas, and the higher costs that could arise from coordination or opportunistic behaviors within the network (ibid.).

A possible solution to mitigate the drawbacks of the two approaches is to adopt a *mixed* method, which implies that capabilities are developed together with the players in the network, such as customers or suppliers, through collaborations in the practical activities or knowledge flows (ibid.). The main rationale behind this approach is that when the company faces complex environments in which the level of customization required is high, there may be needed capabilities that goes beyond the scope of the single firm (Windahl et al., 2004).

2.2.5) The role of collaboration and ecosystems

As we've seen, the development of capabilities is a key as well as complex process that have to involve a trade of between control and flexibility. The role of external actors in the process of servitization of manufacturing firms has been seen as a way to create capabilities that cannot be created alone (Storbacka et al., 2013). The combination of capabilities by diverse firms allow companies to create value and new capabilities that were not previously present in the network (Gebauer et al., 2013). Relationship management is considered as a key operational tool that enable firms to gain the necessary skills to provide advanced services in order to achieve competitive advantage (Kindstrom, 2010). In fact, some scholars argued that competitive advantage can be originated by resources and capabilities that exists outside the boundaries of the firm, called "complementary assets" (Teece, 2007). These assets show their role through productivity synergies between partners and combination of exclusive resources (Daliwal et al., 2011).

However, there are other scholars that focused their attention on the drawbacks of giving too much importance to collaborations. The main issue that should be considered is how the network combinations represent the bottleneck for many transforming manufacturers, due to the greater complexity associated to it and the loss of internal control, which makes more difficult to align it to the company strategy (Huikkola and Kohtamaki, 2017).

The specific capabilities and opportunities that may be enabled by a carefully managed network of collaborations have been analyzed by Lutjen et al. (2019), which identified the main contribution that collaborations and innovation ecosystem can have in the process of servitization. According to the scholars, to be involved in an ecosystem force companies to adopt an open mindset that enable them to better scout disrupting trends and ideas. Additionally, a network of diverse partners helps the firm to better evaluate opportunities over time, reducing the biases, as well as to seize and analyze markets that goes far beyond the boundary of the firm, giving the access to new technologies and customers.

Another benefit that has been reported is the greater institutional coordination that could be reached in networks, due to either the major relevance, either the greater impact on the entire society. The expertise of ecosystem partners can be one of the most relevant resource for the servitizing firm due to the major competence in the specific field and to the existing network that such partner may have.

The position of a company in an innovation ecosystem can provide benefits even in terms of reputation, acting like a magnet for future firms seeking partners and granting to the firm access to a potentially unlimited source of capabilities. The position in the network allows companies also to control the bottleneck in its value chain and, therefore, to optimize the exchange points and the operational flow (Lutjen et al., 2019).

Another set of benefits related to the external collaboration approaches is due to the role that customer relationships may have when developing the servitized-offer. In fact, customer centricity is considered a key element of any service delivery operation (Bolton et al., 2003). The customer role has been described by Tuli

et al. (2007) as a set of three elements: the *customer adaptiveness*, that is the degree of change that customers are willing to accommodate; the *political counseling*, in order to justify internal conflicts; and *operational counseling*, that involves the activities of proactive challenge discussion and information sharing that helps the servitizing company to better shape its operations.

2.3) Open Innovation: the new perspective for collaboration and innovation

This paragraph aims to describe the main dynamics of open innovation approaches. There will be analyzed the main differences between open and closed innovations and the main types of collaboration approaches and intellectual property flows. Then the focus will shift on the implication of the open practices in terms of benefits and costs with a focus, in the last part, of the role it has for what concerns services and servitization transformations.

2.3.1) From Closed Innovation to Open Innovation

As extensively described in the previous chapter, servitization is a transformation that aims to allow companies to fully exploit their potential by designing an offer that is focused on providing a full solution to the customer need. Such transformation requires a re-thinking of the business and of the way the company creates and deliver value, as well as a new set of resources and capabilities that fits the new model. According to Paiola et al. (2012), the development of such new successful-oriented capabilities has to be carefully managed and involves the decision to develop internally (make) or to acquire externally (buy).

According to Chesbrough (2003), *Closed Innovation* (CI) is the term with which it is usually define the tendency of firms to undertake the innovation projects internally, inside the boundaries of the organization and without major collaboration activities. The author pointed out that this paradigm was due to a strong internal-oriented mentality that considered every effort to be pursued in order to achieve competitive advantage, which in this case means to beat competition with completely new products in the market (ibid.). From a project development point of view, a representation of the CI approach implies that new initiatives can be considered valuable only if they enter in the firms boundaries at embryonal phase, that the development of these projects can be carried out within the tools and the competencies that exist inside the company and that the market possibilities of the innovation outcome is related and limited to the actual distribution strategies of the firm (Herzog, 2008).

A key element to consider in the discussion about Closed Innovation is that the main element that is prioritized as a source of superior innovation performance is control. The planning of the entire activity and the secure appropriability of the IP benefits have been seen as the most relevant success factors in the R&D activity, and that's why the main activities that companies sat aiming to achieve them are oriented to the hiring of the best employees, focus only on internally-developed innovations, invest in new discoveries to be the first-mover and protect carefully the firm's intellectual property (Chesbrough, 2003).

Even though the concept of closed innovation was very extensively adopted and produced a great amount of new innovations, at the beginning of the 21st Century Henry Chesbrough described, in his 2003 book *Open Innovation: The New Imperative for Creating and Profiting from Technology*, several factors that were

changing the dynamics of global markets and, therefore, started to question the residual effectiveness of such a siloed approach. Those factors ranged from the increased mobility of talents, the shorter product-life cycle, the new paths for developing ideas, the emergence of venture capital and the increasing knowledge of customers and suppliers (Chesbrough, 2003). In order to better face the challenges of the new markets, the author introduces a new concept, called *Open Innovation* (OI), that was based on the use of external ideas and contribution to optimize and increase the innovation activities of firms. According to Chesbrough, OI can be defined as “*Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology*” (Chesbrough, 2003).

The concept of open innovation differentiates from the past approaches for the centrality of external knowledge, actors and expertise in the innovation process. This concept has been extensively studied in the literature and there are several features of OI that have been discussed in-depth.

The first main feature of open innovation is the centrality of the *knowledge flow*. According to Chesbrough (2003), the main role of OI is to acquire external knowledge and to better exploit externally the knowledge that has been created within the boundaries of the firm. Companies have to open up their barriers in order to create knowledge flow that can allow them to discover new value and opportunities for collaborations with stakeholders (Gassman and Enkel, 2004).

A second relevant aspect is the *Source of ideas*. Open innovation encourages the exploration of different sources for innovation, and a wide range of opportunities to be exploited through different channels (West and Gallagher, 2006). Additionally, Chesbrough (2006) highlighted the possibility to generate advances in technology through multiple expertise sources and paths to market.

A third aspect is the *Innovation Path*, due to the permeability of the boundaries of the firm. Innovation can enter and exit the inter-firm funnel, and some ideas enter in the boundaries after being initiated or partially developed elsewhere while others leave the firm to be exploited in another context (Dittrich and Duysters, 2007). This process will increase the probability to achieve growth through the sales of new products or technologies (Freel, 2006).

A last relevant feature is *Speed and Complexity*. According to Huang et al. (2010), OI allows companies to leverage different and various ideas creating bigger and more complex innovation opportunities, while Gassman and Enkel (2004) focused on the possibility to bring those ideas to the market at a higher speed, allowing the company to achieve advantage over competitors.

2.3.2) Open Innovation processes

Open innovation practices have evolved in various way over the last decades and companies have adapted the way they generate knowledge and deploy innovation according to it. In fact, several scholars tried to analyze the different approaches that were theoretically and practically proposed to gather the advantages that this kind of innovation approach promises.

One of the main contributions in the definition of a more structured framework for the open innovation activities is the one proposed by Gassman and Enkel (2004). The two scholars analyzed an extended database of OI-practicing companies and came out with a framework composed by three main types of activities based on the dynamics of the knowledge and IP flow (**Figure 4**).

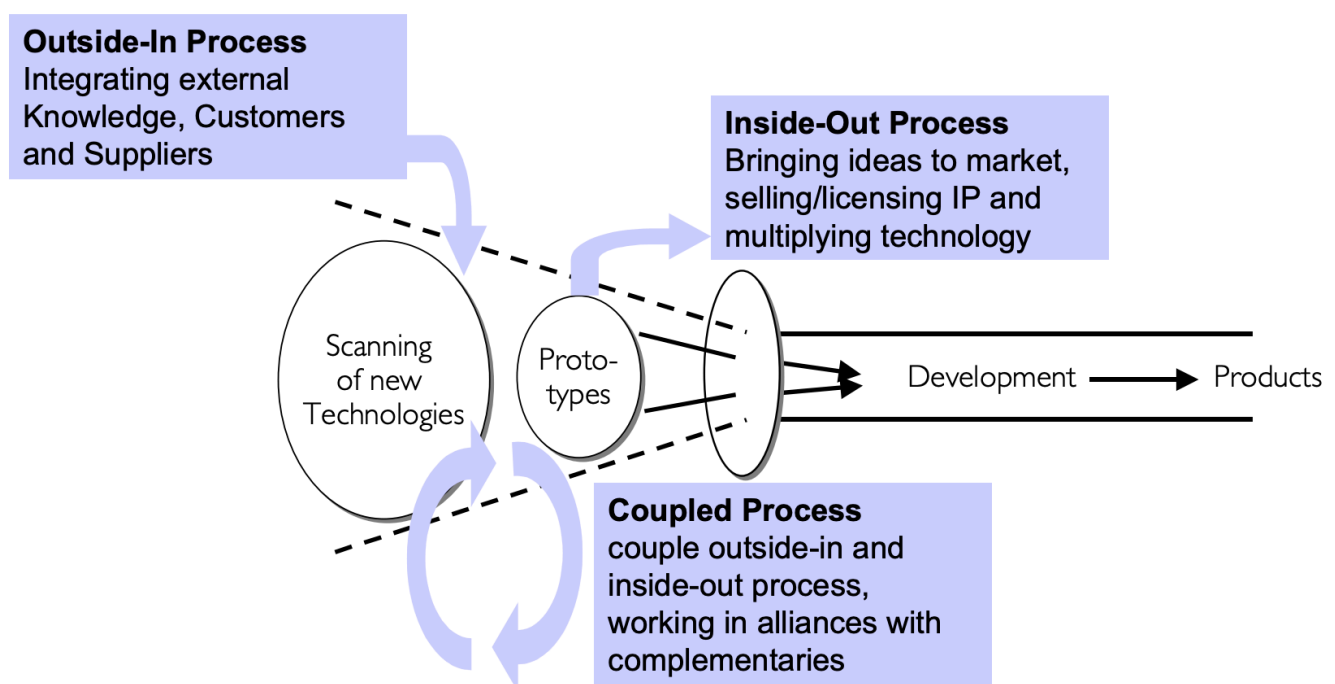


Figure 4: Three archetypes of open innovation processes. Source: Gassman and Enkel, 2004.

The authors classified the open innovation activity flows under three archetypes: *Outside-In*, *Inside-out* and *Coupled* processes.

Outside-in processes, also called *Inbound open innovation*, are those processes that originates outside the boundaries of the firm and then enter in the company to develop. To apply this kind of processes, companies have to understand that the source of relevant knowledge and expertise is predominantly outside the company itself. In this process, the company strengthen its relationship with customers, suppliers and other related partners in order to integrate relevant knowledge and IP inside the company. A key role is played by the

processes of co-creation and co-development. Some examples of these types of activities are customer-supplier integration, idea-competitions, crowdsourcing and IP-in licensing.

Inside-out processes, also called *Outbound open innovation*, refer to the processes that originates inside the company but then leave it, generating an outflow of innovation in the external environment. One of the key aspects of this kind of activities is that it allows companies to profit from their intellectual property in a definitely extended way. Several ideas and innovations that otherwise wouldn't have found their market position can, in this new paradigm, find totally new paths to different customers and industries. Additionally, rather than only profiting from IP, the outbound practices can open new channel of knowledge flows, allowing the company to access new areas of knowledge and new opportunities. Some examples of this archetype are joint ventures, IP-out licensing and corporate venture capital and incubations.

Coupled processes are all the initiatives that companies undertake to combine the two previous archetypes of open innovation, balancing the assimilation of knowledge from outside with the delivery of ideas to external markets. The main dynamics of these kind of relationships involve the commitment of the firm to follow a path of sustained acquisition of knowledge balanced with frequent and substantial externalization of intellectual property to the market. The underlying key element behind this archetype is the creation of strong collaboration and solid networks of players. The goal is to generate long-term relationships based on the complementarity of resources in order to generate innovation. Some examples may be consortia of competitors, customers and suppliers, joint ventures and networks including universities and research institutes.

2.3.3) Collaboration modes

Building their consideration on the implication of the previously described model, several other scholars have developed classifications to categorize the OI practices accordingly to the different ways single companies decided to commit to the co-innovation activity.

A first example of this is represented by Dahlander and Gann (2010). The two scholars tried to develop a model that take into account the direction of the knowledge flow (inbound VS outbound) and the type of commitment of the company involved in terms of monetary expenses.

The first category he identified is the *Acquiring*. These types of companies are focused on acquiring in the market the knowledge in exchange of monetary transactions. Their goal is to invest in new ideas by bringing them into the internal innovation funnel.

The second type, the *Sourcing*, is similar in terms of goals to the previous one. Their objective is to scout ideas in the market and bring them inside, but in order to achieve this, they prefer non-monetary transactions.

In the third type, the *Selling*, are comprised companies that develop several different ideas and prospect internally and have the aim to sell them in the marketplace in case of they don't fit their core business. The mechanism that such companies tries to exploit is the IP-out licensing by finding acquirers interested in the value of their innovations.

The fourth and last type is the *Revealing*. The companies in this category are characterized by the intent to generate new technologies and IP internally but not necessarily profiting from it in the short term. Their main goal is to benefit from the indirect benefits that may arise by delivering innovations to the market.

Other Scholars focused their attention toward the decisions that are made to structure the open innovation activities. A first example of this approach is represented by Pisano and Verganti (2008), that developed a model identifying as two main variables the governance of the innovation ecosystem and the participation openness.

The first category that is identified is the *Innovation Mall*. In this case, the participation is open, but the governance is hierarchical and dominated by the proposing company. The company proposes an open question about a problem and then, after receiving the proposals from a variety of sources, decides internally the outcome.

The *Elite circle* is a different category, where companies adopt a closed participation by explicitly deciding the partners, and successively evaluate the results internally.

Innovation communities are flat networks where every subject can propose a problem and every other interested could provide a solution, guaranteeing an open participation.

The last category is the *Consortium*. In this case the participation is limited to a selected number/type of partners. The solution to adopt is generally selected through an agreement by all participants.

Another point of view that takes into account the management selections of the open innovation processes is the one exposed by Lazzarotti e Manzini (2009). They proposed a model that was based on two key decisions: the degree of openness of the internal innovation funnel and the partner variety.

Integrated collaborators are those companies that try to keep the entire innovation process as much open as possible, but they only interface with few selected partners in order to ensure the relevance of the outcomes.

The second type, the *Closed Innovators*, generally decide to not allow the innovation funnel to be accessible by external parties, limiting their open innovation activity to some rare exceptions with selected companies.

On the contrary, *Open Innovators* adopt a strategy that is focused on maximizing the external collaboration in their innovation process. They collaborate with a large variety of partners and keep the entire funnel open to new knowledge and technologies.

Specialized collaborators tend to involve a large number of specialized parties to solve specific issues. For this reason, they keep open not the entire process, but only the interested one.

2.3.4) Benefits and costs of open innovation

In order to generate a complete knowledge about the implication of the open innovation processes it's important to analyze the different perspective of the modes and the circumstances under which this kind of processes produces benefits and gains in innovation performance. The basic idea under which the implication of OI are analyzed is that this new model of innovation represent the metaphorical application of the principles of free trade to the innovation activities inside the companies, creating a variety of outcomes that differ from the closed approach (Rigby, 2013).

An extended group of scholars tried to focus their analysis on the direct effects of open innovation practices, developing a set of consideration regarding the inbound and the outbound processes respectively.

For what concerns the Outside-in archetype, it is seen as an important way to gather new knowledge with the aim to change the cause-effect relations that drives decisions inside companies, enriching the knowledge base and flow (Laurson and Salter, 2006). This increased knowledge base can provide companies with a more extended technological opportunities, making it easier to exploit new growing markets (Wu and Shanley, 2009). Finally, these new opportunities and possibilities enrich the problem-solving resources and perspectives that companies can follow, increasing the possibility to better differentiate their offer in a unique way (Atuahene-Gima et al., 2005).

On the other hand, the Inside-out processes allows companies to find other partners able to provide better knowledge and expertise to deliver the ideas to the market in a more effective way (Chesbrough and Garman, 2009). This implication has a meaningful consequence in the process of innovation of firms, allowing them to commercialize unused IP assets even in markets where they lack the needed expertise (ibid.). Such companies can use the sales of this otherwise non-profitable IP to strengthen their core capabilities with new investments, increasing the chances to outperform competitor that do not follow the same initiative (Lichtenthaler, 2010).

A second perspective that has been adopted to explain the benefits of the open innovation activities is the one related to their ability to create real options. A real option is basically an opportunity for a company to undertake a business activity in a second moment. It is generally obtained through a form of light commitment. The analysis of open innovation activities with a real option perspective has been carried out by Vanhaverbeke et al. (2008) and identified four main reasons according to which OI can generate opportunities in the form of real options.

The first advantage is that open innovation allows companies to enter and sense new technologies and opportunities by *involving at an early stage*, through minority stakes in start-ups or venture capital, or by developing joint projects with universities.

A second possibility is to *delay the financial commitment* in a new investment opportunity. While closed innovators have to invest heavily in R&D activities to exploit innovations, open innovators can start exploiting

these opportunities externally, by providing support to research and creating a broader portfolio of possibilities before taking the actual decision.

Another advantage of OI is the possibility to *anticipate the exit* from a business opportunity by selling the IP that does not present the characteristics to go forward in the internal funnel.

On the contrary, a fourth benefit can be identified in the possibility to *delay the exit* from a business opportunity. In fact, the externalization of a venturing activity allows the company to monitor the market developments while focusing on the core business, obtaining more time to evaluate the decision to integrate or sell the new business.

A different approach was the one selected by Greco et al. (2019). The authors realized that what was missing in the literature was a framework that analyzes not only the benefits, but also the costs of the open innovation strategies allowing companies to take better informed decisions. The model, the *BeCo Framework*, analyzes the two main types of open innovation flows, performing a cost-benefits analysis as represented in **Figure 5**.

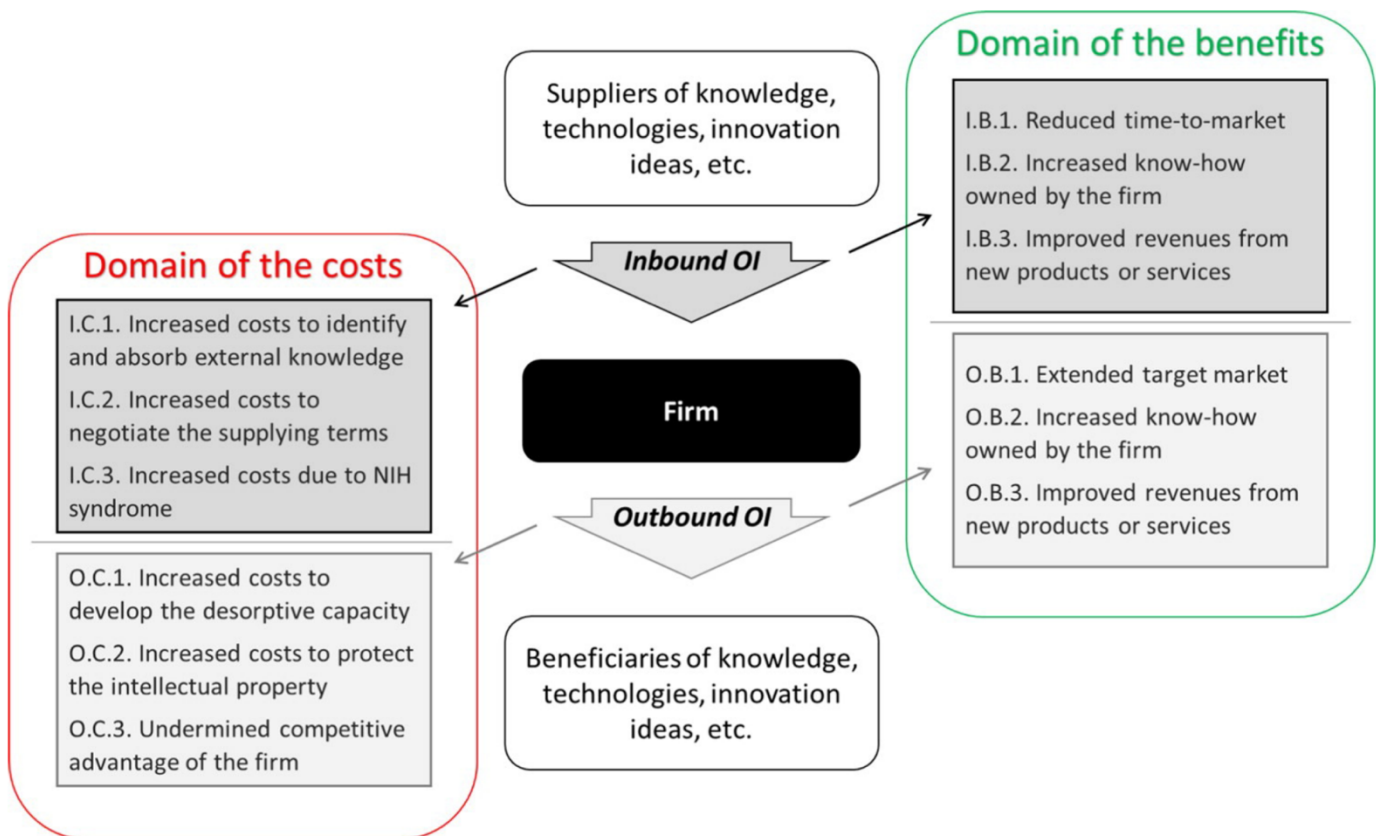


Figure 5: The BeCo Framework. Source: Greco et al., 2019.

According to the model, the *domain of benefits* includes some major benefits determined by the activities of internalization of external knowledge and externalization of internal knowledge.

For what concerns the former, inbound open innovation produces *quicker time to market*, because it generates the knowledge that otherwise would have needed much time to develop, *increase the know-how* that is owned by the firm, due to the fact that the increased intellectual property provides the firm with different tools for the ideation, development and commercialization of their offers, creating a long term advantage. A third benefit of the outside-in processes is the *market success* that is achieved through innovation. That's because the company can generate unusual and innovative benefits to customers.

Outbound open innovation allows companies to *extend their target market*. This is a crucial driver of open innovation activities because companies can differentiate their business and explore growing opportunities in a faster and cheaper way. A second benefit of this archetype is *know-how*. Just like the other archetype, collaboration with partners enrich the knowledge inside of the organization, even though in this case the focus is towards learning the way external partners go to a new market with different technologies. The third benefit is the *market success*, measured in this case by the improved reach of a different market with the cooperation of the more experienced partners.

For what concerns the *domain of costs*, the Inbound open innovation practices are expensive because they need to *identify and absorb external knowledge*. It is because to catch the opportunity of OI, companies need to develop the skills needed to cooperate and profit from an open innovation funnel, as well as to integrate their knowledge with the external one. The second cost is the *negotiation of supplier terms*. This refers to costs of monitoring and costs to make the partners to reveal their knowledge in order to make the activity work. The last cost of the outside-in processes is the *not-invented-here syndrome*. It relates to the tendency of external knowledge to create conflicts inside of the organization and to modify power relation, which is a force that generate resistance to change.

Outbound activities have other categories of costs. The first one is the need for the *development of absorptive capacity*. It relates to all the abilities that allow the company to identify target partners with whom share and deliver their IP, as well as create a relationship to exploit all the benefits. A second cost is related to the need to *protect the intellectual property*, in order to be able to profit from it and to avoid partners from behaving opportunistically. A third cost can be due to the potential *loss of competitive advantage*. This phenomenon may happen when revealing the internal secrets due to the possibility of imitation from the partners at a second time.

2.3.5) Open Innovation in Services

As we've seen, innovation is a key element in the current business environment, and it applies also to service providers. Innovation support companies into developing several different paths to grow and, in case of services, it means either to improve the current offering, either to discover totally new applications and even totally new offers (Chesbrough, 2011).

In order to understand the application of OI in the service domain, scholars have generally started by focusing on the main differences between the innovation activities between service and manufacturing businesses. That's because the evidence has always shown that there are no major differences in the magnitude of innovation between the two types of businesses, but they tend to do it in different ways (Tether, 2003).

One of the main differences is represented by the role of customers in the process. In fact, due to the intangibility of services, customers can't clearly specify their main needs, as well as evaluate easily the performance of the service itself (Chesbrough, 2011).

Another major difference relies on the innovation process itself. That's because the classic manufacturing R&D processes seems to not be present to the same extent in services businesses, as well as the stage-gate models used by manufacturers to manage their product development do not apply in the service context (Chesbrough, 2011). Additionally, the distinction between product and process innovation is not easy to replicate in a service context due to the strict and simultaneous relation that exists between service process and service outcome (Gallouj and Savona, 2009). Another element to take into consideration is that tacit knowledge, one of the key elements to improve the service, cannot be found in advance and become evident only in the innovation phase (Chesbrough, 2011). This is also the reason why service companies tend to cooperate more with their supply chain stakeholders (Tether, 2005).

When it comes to define the role of the open innovation processes in service businesses, it appears probable that, due to the extremely interactive element of their nature, as well as the relational component, open innovation can critically contribute into their development (Mina et al, 2014). In detail, when dealing with collaboration activities, service companies may be more willing to engage in unstructured partnerships, with a lower degree of formality that is typical of the contractual arrangements, even due to the natural intangibility of their business (Fitzsimmons and Fitzsimmons, 2000). In this type of situations companies tend to be more proactive to research partners and resources that guarantee better moral trust rather entering in more complicated legal binding agreements (Ibid.).

One key element to take into account to provide a better understanding of the open innovation activities in services is the partner selection. As expressed by literature, one of the main reasons for companies to cooperate is to get the knowledge they need to undergo some activity or some research they've planned. Some scholars categorized the possible partners into two main categories: *science-based* and *market-based* (Danneels, 2002).

The first category comprises collaborations with universities, laboratories and research centers with the aim to explore new knowledge in a vast majority of areas of the functional management, as well as to explore new ways to grow (Hughes and Kitson, 2012).

The market-based partners refer to suppliers, competitors or customers that can help the innovating company to reach diverse goals such as better specification of market needs and requirements, optimization of costs and sharing of innovation risks (Mina et al., 2014). For example, co-creation with customers is frequently cited as one of the most relevant sources of information when it comes to open innovation in services (Chesbrough, 2011).

According to Mention (2011), service businesses tend to co-operate more frequently with market-based partners, while manufacturers look more frequently for the knowledge of universities and scientific sources.

In his 2011 article, Henry Chesbrough described how the adoption of open innovation practices has led traditionally manufacturing businesses into developing strong market-winning services by providing two examples: Lego and Amazon.

Lego created a program called “Lego Mindstorms”, which included programmable motors along with the plastic parts, allowing customers to co-build the design of the product. After the system was hacked, the company decided not to increase the software protection, but to open it up even more so that everyone was able to interact and modify the customers co-creations. The main outcome of this inbound open innovation process was the creation of a Lego-based programming course for children, which allowed the company to enter the service business and to create a stronger bond with their customers.

Amazon applied an outbound open innovation by sharing its IP on website creation with large retailers, enabling the creation of totally new profits by just selling their expertise. This business then expanded when Amazon started offering to host those new websites in its powerful servers, becoming in this way also the infrastructure provider. After considering the success of this initiative, Amazon replicated it by creating Amazon Web Services, through which the company sells cloud services to potential customers.

According to Chesbrough (2011), there are several ways through which companies can use open innovation to improve their service offering. The first one of them is by working more closely to their customers in order to give them the power to co-create and personalize the service. A second approach is to focus the offer on the utility of the solution, and not on the product features. It enables company to satisfy the true need of its customers and to prevent shifting due to price. The third method suggested by the author is based on the ability of the company to embed into the processes and the organization of its customers, by taking care of entire areas of their business.

2.4) Summary of the Theory

Servitization is a transformation process that represents a way for manufacturing companies to increase the value of their business by adding services that goes beyond the post-sale support (Wandermervé and Rada, 1988). This transformation implies a new set of innovative capabilities, that aim to build a better competitive position for the company (Wilkinson et al., 2009). The way this initiative turns into a new business model and a new offer is through the creation of Product-Service-Systems (PSS), described as bundles of products and services aiming to solve a complex customer need (Goedkoop et al., 1999). There are several ways companies can deploy services into their product offer (Tukker, 2004). Generally, the Product-Oriented PSS places the focus on the physical element and the Use-Oriented PSS, while still centered on the product, introduces other types of transactions rather than ownership. Finally, the Solution-Oriented PSS aim to provide a solution without necessarily involving a physical component.

There are several reasons according to which companies decides to implement services into their offering. A first perspective is related to the need to reach a more extended customer centricity, due to the increasing demand for personalized solutions (Wandermervé and Rada, 1988) and to the key role of establishing strong customer relationships (Levitt, 1983). The second category is related to strategy, due to the ability of servitization to increase barriers to competition (Wandermervé and Rada, 1988), to exploit opportunities outside the core business (ibid.) and to build a more intangible competitive advantage (Hirschl et al., 2003). A third element to consider is the increased relevance of sustainability, that can be implemented through services due to the reduction in wastes and a better re-use of resources (Mont, 2002). The last main driver is the possibility enabled by technology to deliver directly in the home of customers due to the reduced times and the increased interconnectedness of the systems (Vandermerwe and Reda, 1988).

Of course, there are some several barriers that makes more difficult for firms to undertake this transformation. Some of them are related to customers, such as the difficulty to fully value the use instead of the ownership (Baines et al., 2007). Others are company-related, such as the inability to fully commit to services (Gebauer et al., 2005), the structural differences between product and services that generates resistance to change (Kotter et al., 1989), the great effort needed to transform (Baines et al., 2007) and the increased complexity of the competitive environment (Wandermervé and Rada, 1988).

To exploit such benefits and to overcome the barriers companies need to transform and to develop new capabilities in order to effectively deliver PSS to their customers. A key element that has to be taken into consideration is the change in the process of value creation. In fact, the dynamics of value in the new context are different and involve a greater role of the customer from the co-creation phase to the knowledge sharing activities (Chesbrough, 2011). In addition to customers, there are a lot of other actors that have to be managed in order to exploit the potential of servitization (ibid.).

These issues created the need for companies to develop entirely new capabilities such as customer engagement (Edvardsson et al., 2006), market monitor (Kindstrom & Kowalkowsky, 2009), co-development (Mannervik & Ramirez, 2006), relationship management (ibid.) and conflict management (Gebauer and Friedli, 2005). There are several approaches to obtain the needed capabilities to transform, but the main debate is related to the choice of developing them internally or acquiring them externally. In general, internal approach guarantee a higher level of control (Paiola et al., 2012) and lower efforts in terms of coordination (Nordin, 2008). However, the external approach is less risky due to the lower fixed costs needed (Neely, 2008) and it provides the company more flexibility in dealing with the investment (Paiola et al., 2012).

At this point the role of open innovation (OI) emerges more clearly. Open innovation refers to an innovation approach that focuses on the use of external resources to make the company's process more effective (Chesbrough, 2003). Open innovation can be implemented in many different ways, but the core processes relies on the two main directions of the knowledge flows. The Outside-In processes are characterized by the acquisition of external knowledge to increase the company's know-how and to reduce the time to market, while the Inside-out processes refers to the use of external paths to market for the internal innovations and intellectual property, in order to improve revenues and extend the target market (Gassman and Enkel, 2004). The role of Open Innovation in the servitization transformation of companies therefore can be two-sided. On one hand, these types of processes can help companies in the start of the transformation, by enabling them to acquire the knowledge and expertise they need to effectively servitize and to better exploit the benefits of developing customer-centric solutions and explore new opportunities. On the other hand, it can contribute in a later stage when the transformation has happened, more specifically when it comes to the development and the continuous innovation of the value creation process in services, helping the servitized manufacturers to overcome the barriers and to fully commit to this new business model.

3) Methodology

This part will describe the research methodology chosen for the master thesis. In detail, the various choices that will be analyzed and explained are: Research strategy, research design, data collection method, data analysis method and research quality.

3.1) Research Strategy

The research strategy that is adopted to address the research question is the qualitative strategy. This kind of research is characterized by the emphasis on words rather than quantification of some kind of data (Bryman & Bell, 2011). The two main strategies (quantitative and qualitative) presents a lot of points of dissimilarity, like the selected point of view (researcher vs participant), the static vs process image that it provides about a certain topic, the form, that in the qualitative vase is generally unstructured while in quantitative research context tend to be more structured. There are several reasons why the qualitative approach has been considered to be the most well-suited one to carry out this research.

First of all, the qualitative one is the best strategy for exploratory research. In the cases where exploration is the main scope of the thesis, the focus becomes to navigate in unknown concepts exploring diverse opportunities. The best way to obtain relevant information that can help the researcher in this tough task is through extensive discussion and by getting in-depth answers by the respondents, in order to figure out possible theories and combinations. The proposed research question implies this sort of navigating through ambiguous and under-explored areas, due to either the lack of abundance of existing cases either the relative novelty of the phenomenon under analysis.

The research in question can also be considered as interpretivist. This concept describes an epistemological position in contrast with the natural scientific model and characterized by a strong focus on the description of the social world through the eyes of the people and entities that populate that world (Bryman & Bell, 2011). According to Hammersley and Campbell (2012), the qualitative research method has the ability to examine the natural settings of the events, that are defined as the normal conditions (for example where people live and work). It means that this method is really applicable in case the goal of the research is to get to know the perspective of the actors involved in some kind of phenomena in their true and personal view, and not in a standardized environment that is the one typical of the quantitative research (Hammersley and Campbell, 2012).

Another reason why the qualitative approach best fit the scope and the extent of this analysis relies on the concept of constructivism. With this word, it is meant the phenomena of definition of the social world as a product of the interactions between its agents, rather than separated phenomena happening simultaneously

(Bryman & Bell, 2011). The research purpose is to understand the best practices firms can do in order to truly transform with the help of collaborations. Those dynamics are really linked with the interactions between the players and the outcome, either in terms of ecosystem either in terms of results, will strictly depend on the behaviours that all entities involved will assume. That's why qualitative research has an excellent tool to help in finding the answer to this research question.

The priority that qualitative approach gives to behavioural data, as well as its focus towards the identification of causality factors, allows the researcher to derive the single dynamics of the environment as well as the entire process description, letting him building a theory that may explain the findings according to his purpose. Qualitative research has the aim to understand the complexity of a case (Hammersley and Campbell, 2012). It means that this method has not the aim to look across the more sources it can to find a generalizable outcome, but to look in depth fewer cases in order to highlight all the variables and factors that create some sort of behaviour understanding all the possible implications that a phenomena may create in the environment.

To achieve the aim of the research, taking into account what has been discussed so far in the paragraph, it is considered appropriate to choose an inductive approach to conduct the study. Induction is the process of generating a theory starting from the empirical observations (Bryman & Bell, 2011). It means that the process starts with some kind of more or less defined topic, develops with the collection of the data and then finishes with the analysis of the information and, if applicable, the development and formalization of the theory. In general, every inductive approach involves a part of deductive approach. The latter is the process of deducing hypothesis from the theory and then testing them through the research (Bryman & Bell, 2011). In order to fully determine the spaces and the fields of application of an inductive-generated theory, the researcher may want to collect further data to test it (and, for instance, applying the deductive method), giving birth to an iterative approach. The qualitative research is able to provide the researcher a great level of flexibility that can play a key role in the phase of topic generation and when it comes to make adjustments during the data collection and analysis process.

To provide a comprehensive view of the qualitative approach, it is important to describe also the main drawbacks that have been discussed by researchers (Bryman & Bell, 2011).

The first problem that qualitative research may face is an excess of subjectivity. The results of this kind of research can rely too much on the researcher's opinion on what is important and what is not. Another problem related to the excessive reliance on the researcher is the limited replicability of qualitative researches. This is due to the low or inexistent degree of structuredness and the almost impossibility to create a true replication due to differences in conditions and behaviours. Another drawback that many researchers consider typical of the qualitative approach is the problems that may arise when it comes to generalization. In fact, the limited number of cases cannot be representative of all possible cases and also if the sources of information (for

example the interviewees in the case of interview method) is not selected according to a probability procedure or even quota sampling.

3.2) Research Design

The choice of the research design follows immediately the one of the research strategy. It represents the overall structure that guides the selection and implementation of a research method and the following data analysis process (Bryman & Bell, 2011). So, the goal of this choice (and of the research design in general) is to give the reader a chance to see and understand how the study will be carried out (Yin, 2011). The selected research design is the cross-sectional, due to its ability to best-fit the purpose of the research in terms of generating a common framework of analysis. In order to explain the choice, the researcher has provided a comprehensive view of the different types of research designs evaluating their suitability for this thesis work.

According to Bryman and Bell (2011), there are five different types of research design: *experimental, cross sectional, longitudinal, case study and comparative*.

The experimental design is considered to be not a valid opportunity for the scope of this research not only because it is generally considered as more related to quantitative research, but also because of the intention to analyse the cases considering their natural settings, and not an artificially build one.

Longitudinal research design is also really far from the scope of this work for two reasons. The first is the non-interest of this research to monitor some changes in a particular phenomenon over time. The second is the limited amount of time that makes it non convenient to try to evaluate the changes in some phenomenon.

The case study design is one of the most spread method to carry out a business research, and it could represent a good fit with the scope of this research because of its focus on understanding the particular reason why some behaviour or event happens (Bryman and Bell, 2011). The biggest reason that makes this particular design not a perfect fit with this study is the distance that it has with the goal of this research. Although it's true that this study wants to collect information and perceptions through the eyes of the respondents, but the overall goal is to analyse these insights in order to produce a general finding on if and how such partnerships could play a decisive role in servitization.

Another point of distance is that for the scope of this research it would not be enough to focus only on one case, but there would be a need for more points of view to be able to understand all the forces at play when it comes to collaborations and innovations. The latter point could be questioned because there exist multiple case study designs, that allows the researcher to utilize more than one specific perspective in order to provide a more valuable result. However, this kind of design is not to be considered in the case study category. In fact,

the multiple case study is included in the comparative design because it is generally carried out for the purpose to compare the different cases (Bryman and Bell, 2011).

To assess which is the best-fit design for this research, it has been important to understand the main difference and the overall fit between the two remaining possibilities: the multiple case study comparative design and the cross-sectional design.

According to Bryman and Bell (2011), the typical form of a comparative design consists on an ethnographic or qualitative interview research on a determined number of cases that are considered to present some sort of similarities with regarding to a specific phenomenon. In general, it is utilized when it comes to understand and/or demonstrate that differences in some variable of interest are the explanation of an observed consequence or behaviour. For example, in the cross-cultural research, the main goal of the analysis is to indagate the behaviours and opinions of different cultures in order to find if the cultural differences can represent a possible explanation of major differences in the outcome. For instance, the main goal of this kind of analysis is to deeply understand the individualities and their unique context.

On the other hand, the typical form of cross-sectional design consists on the adoption of qualitative interviews or focus groups to understand the variables of a process and the general connections (Bryman and Bell, 2011). The key features of a cross sectional design are the number of cases, that has to be greater than one, the timing of the data collection process, that has to be as much short as possible and the focus on examining the relationships between the variables and/or the behaviours.

Both of the two methods present some key conditions that could have made them a right choice for this research as well as some elements that could suggest that they were not. For instance, the selection has been achieved through a deep analysis of the main focus of the two methods. In fact, if the focus of the research is more oriented towards the single cases and their unique settings, so the comparative approach is the right one while, if the goal is to produce general findings with a focus not only on the single case but to the entire sample of cases, then the cross-sectional is the best one (Bryman and Bell, 2011).

Considering the scope and the purpose of this research, although the analysis of the unique context of the respondents is a key element to take into account in the process, the opinion is that the main goal was to find the common best practices and the linkages between the different perceptions and experiences in order to develop a general framework for the servitization of commercial real estate companies based on collaborations, and therefore, the cross-sectional design is the one selected.

The application of the cross-sectional design has not to be considered as strict. As a matter of fact, to interview the several potential respondents in an exact single moment in time is probably impossible considering the scope of the research and also the need for exploration. For this reason, the cross-sectional selection has to be considered strict only in terms of the main focus that the research has chosen but has to incorporate major flexibility when it comes to the process method.

3.3) Research Methods

In order to get the empirical data needed to provide an answer to the research question, the development of a data collection plan plays a key role. Its goal is to help the researcher in organizing the way he will approach to the information source and the way to extract the important data from it. The first step in this process is the selection of the research methods.

There are four major methods that may be applicable in a qualitative research to get data: observations, focus group, document analysis and interviews.

Observations and document analysis go beyond the scope of this research due to the limited amount of time that is available and the lack of guaranteed permission to access to private documents and/or areas of the target. Also, focus group could provide really meaningful insights due to their ability to allow expert and qualified participant to discuss and to generate new ideas, but its application can only be considered as a plus due to the expected difficulty in organizing. Therefore, the method that is chosen to carry out the research is the interview.

Interviews are considered to be a best fit for this research project for several different reasons. First of all, qualitative interviews allow the interviewer to capture the respondents' own perspectives and perception of a topic. It means that they are the best way to investigate the real factors that matters the most for the interviewees, as well as the main threats that they see (all factors of extreme interest in the proposed research). Another important reason is the ability of this method to provide answers that are rich and full of details. It is a really important consideration due to the need for the researcher to extract as many insights as possible to derive conclusion from them. Interviews also offer the possibility to create an interaction with the respondent, opening the doors to possibilities of re-interviews and follow-ups.

Generally, in qualitative research there are two ways for conducting interviews: unstructured and semi-structured. The formers are more similar to an informal conversation and can be framed around an overall question or topic. They probably represent the best way to capture the true and free perspective of the respondent and are exploration-oriented. On the other hand, semi-structured interviews start with a relatively specific topic and are supported by a more detailed interview guide providing a good balance between focus and flexibility. As it will be explained in sub-paragraph 3.3.2, in this research both types of interviews have been used.

3.3.1) Secondary data collection

The literature review process has as the main goal the analysis of the present state of arts regarding a particular topic of interest in order to picture and define the boarders into which the analysis will be performed. For this research, the literature review has played a key role in highlighting the main areas of concern. The process of gathering the secondary data was conducted according to the three steps proposed by Bryman and Bell (2011): *Specifying the question and planning the review, conducting the review and reporting and dissemination.*

The first step was related to the identification of a research question that was clear enough for the readers to understand and for the researcher to investigate, and that fulfilled the feasibility criteria in the available amount of time and resources. This process allowed the researcher to focus on the two main theoretical frameworks of servitization and open innovation. This process, alongside with the unstructured interviews outcomes, allowed the researcher to focus mainly on the servitization transformation, making it the core part of the secondary data collection due to the prevalence of theoretical background as well as the centrality of the topic for the real estate sector.

The second phase of the process was the research. The aim of this step was to provide an extended and insightful explanation of the main theoretical concepts as well as providing a framework to connect the two topics in order to provide the researcher with the tool for an effective analysis. To collect the data and therefore conduct the literature review, several databases were used, such as Google Scholar, Scopus and Web of Science. Additionally, another source that has been used is the internal database of the University of Gothenburg. To reach the majority of relevant articles ad publications while remaining focused on the topics of interest, several keywords were used: *Servitization, Servitization transformation, Product-Service-System, Service transformation, Service Business Models, Servitization benefits, Servitization challenges, Servitization collaborations, Servitization value chain, Servitization process, Servitization ecosystems, Open Innovation, Open innovation services, Open service innovation, Servitization capabilities, Capability requirements, Service Capabilities, Open innovation benefits, Open innovation costs.*

Every source of information was validated through its trustworthiness, the number of citations, the journal of reference and the peer-reviewing system.

The third step consisted on the creation of the chapter 2, which comprises the main outcomes of this process and the main authors that contributed to the definition of the theoretical background, with the identification of the period where those theories were formed and published.

3.3.2) Primary data collection

The second process that allowed the relevant data to be collected was the empirical research. The latter is a way to get information and develop knowledge based on the observation (that could be direct or indirect) of real cases. The main goal of this process is twofold: to test a theory in practice and/or to gain enough knowledge in order to build a theory (the second is generally associated with qualitative research).

For the scope of this research, a combination of the unstructured and semi-structured interviews has been adopted. In the first steps of the analysis, when the clear orientation of the research had still to be crystallized, an unstructured approach has been used. That's because the first interviews served to understand the real perspectives of the main actors and to discover their considerations on the subject, fulfilling the aim to start the research with a more general view. The main outcomes that have emerged in this process allowed the researcher to focus on servitization, being it identified as the underlying driver of the transformation of commercial real estate companies and as the main catalyst of the benefits of collaboration and open innovation activities that are planned or prioritized by such companies.

In the second step, when the focus and the most important elements was already revealed, semi-structured interviews have been applied. The main advantage that the application of this method in cases when the main factors/variables are already discovered is that it provides the researcher a higher level of comparability. The general interview guides that have been developed to conduct this kind of interviews are available in the **Appendixes**.

The interview process always started with the request of the researcher to record the interview for a better use of the true data obtained and to ensure a good contextualization of the information obtained in the analysis phase. The starting element of each interview has been always the description of the research purpose and the introduction of the main topics that would have been discussed during the meeting, and then followed with the core questions. Due to the extraordinary circumstances in which the research was carried out caused by the outbreak of the COVID-19 pandemic, the vast majority of the interviews were conducted through digital meetings with the help of tools such as Microsoft Teams and Zoom. After each interview, the researcher went through the records to create an organic and logically ordered transcript, that constitute the basics for the following data analysis process.

3.3.3) Interview Selection

The second step in the overall process of data collection plan development is the determination of the sample. This choice is relevant because it involves the determination of the sources of the data and have repercussions also on the overall quality of research.

For the extent of this research purpose, there have been chosen four main criteria for the selection of the sample:

- *Relevance*: the chosen respondent has to have the required knowledge/expertise to provide relevant information for the research.
- *Availability*: the chosen respondent has to be available in the time that constraint the research and has to be addressable by the researcher.
- *Non-Random*: the respondent has to be linked to some extent with the purpose of the research or has to have an interest in it, which means that is representative of a company that plays a role in the analysed ecosystem.
- *Variability*: the respondents has to provide as many points of view as possible, always considering the priorities and the scope of the research.

The goal of the research is to gather evidence in order to describe the potential of servitization-enabling collaboration strategies for commercial real estate companies to provide a useful guideline for FTK. Therefore, FTK helped the researcher by providing him with his networks of clients and contacts, identifying the companies most suited to provide relevant pieces of information as well as the professionals that possess the relevant expertise and knowledge to dive deep into the research topics. This contingency played a key role for the sample to meet the criteria of *Relevance* and *Non-Random*. The *variability* criterion has been met by interviewing not only professionals of pure commercial real estate companies, but also managers of corporate real estate divisions and partner companies in service-development projects. Even if the goal of the research method was to apply a theoretical sampling, which means that the interviews had to take place until the reach of saturation, the criterion of the *availability* was considered to be insert for two main reasons. The first is the time constraint, because it has not been possible to reach all possible sources of relevant insights in the given time. The second is the outbreak of the COVID-19 epidemic, which made more difficult to find a greater number of professional available for interviews due to the greater amount of work and the higher difficulty in dealing with the complexity of the situation.

The series of interviews that have been carried out is shown in **Table 1**.

Table 1: Sample of manager interviewed

Name	Role	Company	Date	Type of interview	Duration
Ramon Nogueras	Head of Global Real Estate	AstraZeneca	05/03/2020	Face-to-Face	41'
Tobias Kristiansson	Development Manager	Castellum	23/03/2020	Digital Interview	55'
Niclas Ingeström	Chief Digital Officer	Castellum	30/03/2020	Digital Interview	45'
Frode Langmoen	Technology Executive	IBM	02/04/2020	Digital Interview	28'
Jacob Torell	Chief Executive Officer	Next Step	07/04/2020	Digital Interview	24'
Staffan Nordenstråle	Digitalization Director	Volvo Group Real Estate	09/04/2020	Digital Interview	38'
Lars-Erik Lindberg	Innovation Leader	Ericsson	14/04/2020	Digital Interview	22'
Per Östling	Senior Advisor	First to Know	22/04/2020	Digital Interview	44'
Magnus Tengberg	Head of Real Estate Development	Vasakronan	28/04/2020	Digital Interview	32'

Source: produced by the author (2020)

3.4) Data Analysis

By the time data have been collected, the step of the analysis started. Of course, in practice the analysis is an iterative process and for instance it did not properly start at the end of the data collection, but of course when all the relevant information has been properly stored, this new phase has started its main role.

The main goal of this step is to break down the complex phenomenon of interest into smaller topics and discover the main relationships and dynamics among them. This process wants to generate knowledge in fields that weren't object of abundant previous research and to provide a deep understanding of a particular topic.

The selected strategy to conduct qualitative analysis for this research is the thematic analysis. This strategy can be broadly extended to all the approaches to qualitative analysis that use coding and a categorization of the observations. In fact, this kind of approach can be found in most of the possible qualitative analysis strategies, and also, it is not clearly defined the exact meaning that researchers give to this method (Bryman & Bell, 2011). For this reason, this research is going to refer more specifically to the grounded theory setting of the analysis.

Grounded theory can be defined as “theory that was derived from data, systematically gathered and analysed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another” (Strauss and Corbin, 1998). The main difference between grounded theory and analytic induction (the other main qualitative data analysis strategy), that for instance is also the main reason for the adopted selection, is the strong focus of the former on iteration. A key element in grounded theory is that the analysis and the data collection proceed referring back to each other. This approach is particularly useful in case of multiple opinions because it allows the researcher to modify and adapt to all the differences without foreclosing his ability to reach a theory.

In the process of application of this thematic analysis a key role will be played by the step of coding. This procedure consists on breaking down the data into component parts, which are given names and that represents the minimum building pieces of information. The aim of this process is to achieve a better organization of data and to make them easily comparable and interchangeable, increasing the level of adaptability of the analysis. This factor has been extremely useful for this research because it allowed every new data to influence the ongoing theory development and, therefore, to add a new perspective or detail in order to create a more complete image of all the possible combinations.

The process of analysis is structured in three overall steps. It is important to note that the application of this procedure has not been linear and for instance the following steps are not to be considered with fixed boundaries.

The first step is the coding process. It consists on the identification of the codes (first order concepts) from the interviews through text analysis and by highlighting directly on the text. This process has been applied systematically after each interview transcription and there have been revisions in case of some major changes occurring due to the additional data collected.

The second step of the process is the comparison process. It consists on comparing related codes in order to form a broader piece of information that is consistent across the interviews. The goal of this step is to identify the themes (second order concepts) that represent the main categories of interest for the analysis of the phenomena. This process has been applied constantly because every new and additional information could modify or change the relationship between codes, influencing the aggregate themes and their relevance in the process.

The third step is the aggregation phase. In this phase, the core themes have been analyzed to find the major relationship and link among them with the aim to condensate them into aggregated themes. The goal of this process is to identify the major elements (the aggregated themes) that could explain the analyzed phenomena in order to derive the major hypothesis that constitute the building blocks of the outcome. At the very end of the process, two macro-areas have been identified in order to present the results properly.

An excerpt of the coding process is presented in **Table 2** while the entire table is available in the **Appendixes**.

Table 2: Excerpt of the coding table

Collaboration helps to find new opportunities	Opportunities generation		
Collaboration helps to discover opportunities far from the core business			
Networks represents sources for new business and opportunities			
Openness is the condition to create add-ons services			
Open innovation helps to build a portfolio of opportunities			
Generate innovation activities through openness			
Networks can provide opportunities for digitalization and smart cities			
Exploration of disruptive opportunities out of siloes	Planning Process	Challenges of open innovation approaches	Open innovation role in servitization
Need for clarity in the planning process			
A challenge is to be clear on non-financial benefits			
Need to find the appropriate timing for each activity			
Clarity in the communication of the win-win benefits	IP protection		
Need for a clear planning of rewards and contributions			
Core capabilities IP has to be protected	Organizational Readiness		
Overcome fears by making the cluster attractive and valuable			
Need for organizational adjustments and dedicated teams			
Challenge to build organizational commitment to change			
Ovrcome siloes is a key barrier to collaborations	Networks and Ecosystems		
Culture has to change to a more creative one			
Networks are the best way to create standards			
In networks and ecosystems there can be acquired the needed skills	Clusters of firms		
Networks can play a role in creating demand			
Ecosystems can open to new opportunities			
Clusters are key to bring companies together			
Clusters represent the perfect way for big projects development			

Source: produced by the author (2020)

3.5) Research Quality

To assess the quality of a business research, the generally adopted criteria are *reliability* (if the results are repeatable, can be internal and external), *replication* (replicability of the entire research) and *validity* (reliability of the conclusions, can be internal and external).

However, several researchers highlighted that these kind of criteria does not make any distinction between qualitative and quantitative studies and that, considering the main differences in the approach, results more suitable for assessing the quality of the latter type of researches. In fact, it seems difficult to adapt concepts such as external validity (generalization of the results beyond the specific research context) or internal reliability (more observers agrees exactly on the results observed) in contexts where the particular context plays an important role and the perception of the researcher drives the analysis process. For this reason, as suggested by other researchers, it appears the need to judge qualitative research according to a different and more tailored set of criteria (Bryman & Bell, 2011).

Lincoln and Guba (1985) and Guba and Lincoln (1994) suggested to evaluate qualitative researches according to two main criteria: *trustworthiness* and *authenticity*.

Trustworthiness valuation is based on the analysis of 4 sub criteria:

- *Credibility*: is the measure according to which the results generated by the research are credible in the context in which they are derived. For the scope of this research, it has been important to carry out a meticulous analysis of literature and of the empirical findings in order to meet this criterion.
- *Transferability*: relies to the generalizability of the research with no regards of the context. Even though it is probably the most difficult criterion to meet, the researcher tried to take into account as many points of view as possible to provide a picture that does not leave any relevant information aside, and, successively, evaluated the extent to which such insight could apply also in different contexts.
- *Dependability*: this concept is related to ensure trustworthiness through an auditing approach, that can be reached through a strong documentation of the steps. It has been fundamental to ensure a high level of detail and transparency by a careful explanation of every phase of the research and through a clear description of the process in the following chapters. Additionally, the recording of the interviews was applied in order to enforce this criterion.
- *Confirmability*: to act in “good faith”, which means to ensure the maximum possible level of objectivity. A key role in ensuring the respect of this criterion has been played by the professional behaviour of the researcher in the entire process, without letting personal ideas or beliefs to interfere with the way he carried out the research and analysis.

For what concern authenticity, this criterion is composed by ontological authenticity, catalytic authenticity, tactical authenticity, educational authenticity and fairness. All these criteria are mainly concerned with the

political and social impact of the research. For this reason and considering the scope and the purpose of this research, the criterion of authenticity has not been applied as a quality measure and, therefore, the quality of the research has been assessed only by the trustworthiness criterion.

4) Empirical Findings

This chapter will provide a description of the outcomes of the interviews. The goal of this part is to expose the outcome of every interview in order to create a homogeneous understanding of the single perspectives of the topic. To best fulfill this priority, the outcomes have been categorized by interviewee and, for the sake of clarity, the paragraphs are grouped according to the three types of companies that have been interviewed.

4.1) Real Estate Companies

4.1.1) Castellum – Development Manager

Castellum AB is a real estate company involved in the management and development of commercial premises. The interviewee is a senior development manager that is mainly focused on organizational growth.

Servitization Transformation

Servitization in the industry originates by a situation of fact: our business model has always been to own the spaces and interface with people and companies that rent them. For this reason, there exist an “infrastructure possibility” to build on more services and diversify where the money comes from. Additionally, customers will demand new services and from a company perspective it opens the possibility to not only increase the revenues, but also to provide additional solutions that strengthen the relation with customers and creates a lock-in effect due to the major value that comes from service-differentiation. In fact, it allows more customers problem to be solved, increasing their willingness to not change provider.

Additionally, there exist the possibility to not just sell services to employees, but to sell the marketplace to other companies in order to let them reach all the customers that goes to work in the buildings. One consideration could be that some kind of new servitization will not be an additional source of revenues, but it will be an element that customers want and therefore, will serve for an indirect goal. For example, as stated by the interviewee, *“a tenant may have access to its own customers through the commercial real estate physical and digital infrastructure and, even if it’s unclear how to monetize this service, it will be a source of great value for that customer”*.

Along with customers, the drivers of the process will be different and of different types. Many companies are concerned with the impact that they have on the environment but, considering the building perspective, their impact is just the renting from another company. For this reason, the collaboration with the provider for some sort of new solution, for example solar panels on the roof renting, that could help them achieve their goal.

Technology will also play a key role. Nowadays “*it exists digital platforms that grant the access to customers and tenants*”. These platforms are useful for customers in order to find ways to help each other, and to communicate the needs and the demand to a potential provider. Technology is also able to provide services to people that were previously more complicated. In fact, as exposed by the respondent, “*If we think about that there is the possibility to know immediately, and even predict, the needs of people with datacenters and IoT sensors, it’s possible to realize that even with old physical platforms improvements the service perspective are enormously enhanced by technology*”.

The environment of CRE is changing, and customers business models are changing too, so it’s important for companies to adapt in order to keep creating value for them. Flexibility is one of the most game-changers needs of customers right now when it comes to logistics, due to the increased e-commercialization that necessitates of new operating models. In this case it’s important to include it in the value proposition of CRE, for example by including and customizing technical platforms to create online shops with the current physical space lease. The future will definitely include the owning of software, not just hardware as it was in the past. Another solution could be some risk-management practices, that could help companies to share costs through platforms and get a quicker access to market. For example, CRE could provide co-working to facilitate high-fix-cost startups to get financing and share the machineries and, by doing so, helping them reach the market and getting an exit strategy, that could be for example an acquisition.

Platforms can help connect customers, creating the condition for more deep relations and for real marketplaces, with a new role of real estate as market maker and facilitator.

If focusing on co-working, the main competition comes from bars like Starbucks, that allows people to buy a coffee and sit and work for five hours. The future of the industry is not in owning, is in either creating new solutions with the existing premises, for example smart houses that can easily change, either moving from being constructors to being experts in working places, mastering the knowledge of what customers want in order to provide the best workplaces.

Company culture is one of the most important elements to consider when it comes to understanding how companies need to change for servitization. In CRE, employees are used to simplification of offers, and leases have to be as clean as possible. The servitization perspective is the opposite, so an intervention on culture is mandatory. Courage and risk taking are two of the main attributes that leaders have to show in order to see and communicate opportunities. The process of servitization will most likely be made of small actions from employees, and for this reason it’s important to build a mentality. “*Companies have to think about how they can do business with the requests coming from the customers, instead of focalizing on what they actually offer*”, the interviewee said, explaining how entrepreneurship is the key element that has to be developed.

Role of Collaborations

Collaboration will play a decisive role in the process, because the ones that make up the best collaboration strategies will be the ones to win, due to its ability to cut the risks. That's for two reasons: the inability of the company to provide a service that actually is far from its competencies and the fact that maybe there are not so many customers demanding for one service. In this sense collaboration helps to provide the service with the needed skills and helps to put together a critical mass to make it profitable. In addition, collaborating with competitors may help to grow together, building trust in between.

Mastering the capability to provide services can cost a lot of money and therefore could be considered not worth it, so the first thing is to carefully watch demand and then maybe take decisions such as acquisition. The company acquired a co-working company in order to provide flexibility and the vision of owning several companies in the future is probable.

An interesting example is a digital key system project whose aim is to help the company to extend and at the same time secure the access to places. It could provide flexibility in accessing places upon request optimizing the operational needs of the Customers. This is also an example of how *“collaboration can boost innovation because this solution can be seen as risky in some perspectives but, if there is a network of Real Estate Companies, it will create a standard that will be difficult to put aside”*.

Sustainability can represent a good starting point of collaboration, due to its shared vision and society-oriented goals that may drive many organizations in.

If we look at the office sector, there are several unmet needs of people that works there, such as food, cleaning and other. For this reason, the future customer relationships will include the possibility for customers to select the additional services. Collaborations with service providers companies will make it possible. For example, when it comes to furniture, such companies could rent it and then could re-cycle in a sustainable way for the next use. It is a sustainable way of doing services and maybe there will be no need to own a company like that but just to have it as a partner. Customers could also play a role in the process by co-developing and providing data and insights. For example, when it comes to save energy, customers will play a key role in co-configuring the needs and allowing a smart-energy consumption.

Open spaces help to learn how to collaborate with other companies. The goal is not to learn and be better than them. The goal is to bring the best closer enough to produce an innovative outcome that could benefit together.

In terms of the main partners, of course startups will play a key role, but due to the high uncertainty of where this process will head, basically every company could be a partner of interest.

Existing customers can be an excellent source. An example is the hotel business: *“this customer could provide several services such as food delivery, to tenants, increasing their customers and the value that the real estate company provides to them and to the others”*.

Technological companies are also really relevant. There's no end to the possibilities, but the start may be with more similar and already existing customers.

When it comes to competitive dynamics, *“companies need to overcome the idea of the first who comes, fill the patent and keeps the innovation for himself”*. In fact, servitization is something that cannot be patented because, in some ways, is something that other companies already do, and the role of CRE companies is to connect other to get services. Additionally, *“there are big projects and challenges, such as smart cities, that imply a higher level of trust and collaboration from RE companies”*.

4.1.2) Castellum – Chief Digital Officer

Castellum AB is a real estate company involved in the management and development of commercial premises. The interviewee is the Chief Digital Officer that is responsible for the digitalization strategy of the company.

Servitization Transformation

The ratio behind servitization is to create more services for customers in order to make their life simpler. One perspective is to do services for the company, for example renting out furniture or cleaning services. The other perspective is focused on the employees. The main goal is to make the share of revenue related to services really relevant. It could allow to save money from being invested in new buildings by more efficiency in the actual offer. The main perspective is to consider sustainability and climate action as a priority, and focus on the people, rather than companies, to get the truly winning insights.

As exposed by the CDO, *“The goal for CRE companies is to be really close to customers, in their pockets and in their phones. The company needs to understand what the customer does, where do they live, which transport do they make”*.

In few words, firms need to build a clear knowledge of the customer's profile and on the kind of demand that they need to meet. So, a key role is played by data and by touchpoints. An example of this is the use of digital platforms such as apps. An important consideration is that the software is just the top of the iceberg while is the backhand what really matters. These tools could allow to book conference rooms, connect co-working space users and a lot of possible other things. Artificial intelligence can be a useful tool to get data from the buildings in order to know the habits of the customers and at the same time help them to optimize or improve their office space usage. Also cloud services will play a role in the process. The key challenge is to bring customers into the app and make it useful and accessible. A solution could be simplifying their experience by

using the phone to do all the basic ideas, such as open doors or request services, allowing the company to bring you in their platform.

To embrace this opportunity, one of the first changes that have to happen is the mentality inside the company. In the past, the main focus was renting out space, while in this new context, employees have to sell what customers demand. So, the focus is on people, not on technology, and people have to embrace the change. Additionally, even the customer identification has to change, because the focus doesn't have to be limited to the companies that actually sign the contract, but to all the employees that come to work in the offices every day.

Role of Collaborations

Open innovation activities could be really interesting, but they have to be planned in a good way. Hackathons for example could be a good proxy because *“they allow to focus on a specific topic”*. Additionally, to make it successful and not too widespread, there has to be teams of work that are able to take responsibility of the job. An even better approach would be to include customers and, more specifically, to make the knowledge and ideas come from them because they see the problems in different ways and the company can have more grip on the changes in demand. An example is a *“crowdsourcing experiment when it was asked to people to complete projects for their home by their own, in order to come up with creative ideas that could be scalable”*. To make OI work, there have to be a massive organizational change and adaptation, because *“when it comes to evaluate the future use of the knowledge generated, all the company should be committed to embrace and discuss it, according to the areas that these disruptive ideas affect”*.

The combination of external agents and internal ones is key to make innovation successful for the company in the long run. So, it's important to get the more people possible on board. Startups can give the speed that is necessary to solve the complex changes of the current times. For example, in a project *“we had few time and we focused not on the realization of a PowerPoint that could explain the project, but we developed a basic version of the idea in order to show it directly”*. This concept is called Minimum Viable Product in the startup world, and it couldn't have been possible to happen if the collaboration was with another big company. Additionally, startups think in a totally different way and therefore are the only medium that allows big company to not be disrupted but to disrupt.

The collaboration activities have generally a tech-oriented goal and service-oriented goals. To give an example of the former, some of the activities that we are carrying out nowadays are related to building control systems. For what concerns the latter, a way of working that we developed is based on *“encouraging ideas from external agents and processing them with a network of startups, which allows to have much speed, due to the slowness*

of big businesses, and to establish a customer-oriented way of thinking rather than a profit-oriented one” (how can we get more customers instead of how do we make money with that). For this reason, it’s important to have in the company some professional allowed to take risks.

4.1.3) Next Step – Chief Executive Officer

Next Step is an urban developer and real estate company who acts in the Gothenburg area. The interviewee is the Chief Executive Officer that is in charge of the management of the entire company.

Servitization Transformation

The goal of servitization is to start seeing the tenants more as customers, increasing the business opportunities towards them. It means to target the right tenants in processes of urban development and build with them tight partnerships. It implies also that the focus has to shift from pure renting to a deeper understanding of the vision and attitudes of the potential customers in order to co-develop services that create new types of experiences. For example, we are supporting the creation of industry-specific clusters to whom we could not only provide the space but sell additional services to boost their cooperation such as meeting rooms, events with investors, speakers and management consultants. Co-working business is an explanation of that, because customers are oriented towards the solution, not the product, and the office is just a part of that. And one of the opportunities that we could exploit is the need of companies to become closer, which means that they need the infrastructure to reach that as well as the software services that allows to optimize their interrelations.

According to the interviewee, services right now have to go beyond the space-related ones and look to *“winning models such as shopping centers, that leverage services in order to attract more people and more advertisers and get to charge, if successful, higher rents”*.

In this process, one of the main drivers is the changing customer needs. They demand more either in terms of experience either in the technical issues, such as cloud and digital tools that allow to *“deal with extraordinary situations, such as the COVID-19 outbreak, or to adapt to a more flexible and versatile type of work not anymore office-dependent”*. Additionally, customers are concerned to attract the best employees. Creating clusters is therefore an optimal way for them to improve their network and to exploit the possibilities to find highly skilled employers. Network is becoming more important than the beauty of offices and for this reason it’s important to attract and retain the best customers in order to create an attractive network. The orientation of services has to be to improve the daily life, like gyms or daily lunch, to act directly on people.

Company approaching servitization need to change because it's totally a new kind of market and therefore requires different attitudes. There is the need to overcome the square meters rents and approach a totally new mindset aiming to take care of the customers and really optimize their time. Time is over for co-working based only on desks renting. Companies needs the context and a program to create and deliver activities.

Role of Collaborations

The underlying concept is that companies have not only to provide space, but to organize something in the space. Real Estate have to take initiatives in order to bring companies to bring much more together and in innovative contexts. It means that bringing companies together allows to generate innovations and, therefore, a better space experience, which turns into higher revenues and profits from a real estate provider. A condition to make this happen is to *“expand the knowledge of companies beyond the pure building or providing space”*. Cooperation are needed to build the experience in two ways. The first is the information collection through customer interactions. Speaking with them is the only way to truly understand what they demand and how to solve it. Secondly, networks can provide the knowledge and the resources to better build the experience. An example for that has been provided by the interviewee: *“think about how important the network of investor could be for a CRE company whose tenants are startups. Companies need to cooperate with other industries because it's the best way to reach new services opportunities. An example is the provision of a set of product-services like lab equipment, venture capital bars for healthcare companies in addition to the usual rent”*.

Open innovation activities are fundamental because of the changing ways of working. RE companies have to *“design new ways to work with the tenants and the teams need to leverage speed to deliver projects and this requires a facilitator role by CRE”*. To achieve this, there is the need of different types of knowledge in the process, and standalone companies don't develop the diversity and agility needed to win this challenge. Closeness and cluster-building activities will become a core aspect of real estate development and of the future of collaboration between companies. The focus will be project-oriented, to develop programs and target strategies to achieve the innovation goals. The main goals of the process are attracting the best people and to increase the speed of the innovation process in order to arrive to the market as first movers. One of the main barriers and challenges is how to bring in other companies to cooperate, that is to develop solutions that generates attractiveness of the cluster.

4.1.4) Vasakronan – Head of Real Estate Development

Vasakronan is the Swedish largest property company that owns, manage and develop centrally located premises in the major areas of the country. The interviewee is the Head of real estate development that is responsible for the development of the major projects in the Gothenburg area.

Servitization Transformation

Servitization is something that is growing year after year in the commercial real estate environment and is embodied in the development of different types of offers that companies can deliver to their customers. Customers have become more demanding in terms of personalization and flexibility. In particular, the interviewee explained that the latter element has represented a strong drive towards standardization because *“being able to provide standardize spaces allows to shorter the time of the leases and to easily re-arrange the space for upcoming tenants”*.

Another aspect that really changed our offering is the co-working approach. In fact, this flexible solution allows tenants to be members and, at the same time, add-on different types of services according to their specific needs.

Digitalization has played a great role in shaping the development of commercial real estate and the value the companies provide to customers. Digital tools allow to collect a massive amount of data that can be used by tenants to optimize the way they use their premises. It impacts also the sustainability perspective of companies that are more able to avoid the waste of resources.

Servitization will allow companies to come closer with their customers, enabling them to increase the value provided and strengthen the relationship. Additionally, the business offer will be better than before. Assuming the digital platform service, it will provide a wider business case regarding the different customers that we reach.

One of the main barriers to servitization is the conservative perspective of the customers in relation of the office usage. Even if in the last years the customers demand for open spaces has grown, there is still a long way before total flexible solutions will be mainstream. Some of the benefits of the traditional commercial real estate, such as the security of the offices and the control, seems still very appreciated by some types of tenants. Additionally, there is still lack of understanding of the ways workplace management can support the core business of the tenants. In fact, companies are generally concerned with their operative activities and the communication activity from CRE players have not been effective in letting them figure out the benefits they can get from them.

Servitization will change radically the relation between real estate providers and tenants. One aspect will be the provision of services such as cleaning and maintenance, which in part are already present. Another aspect will require to go beyond the core activities for commercial real estate companies and imagine services that provide new solutions to the customers. CRE companies have to become less suppliers and more partners for the tenants, understand what they need and help them driving change and show them how premises can be useful to play a role in their business. It's not just about workplaces, but a more integrated perspective has to be adopted. It can be virtual reality meeting rooms or access to smart mobility solutions. The key aspect is to bring together many players and to create integrated platforms, solutions or softwares that will generate interactions between customers, partners and CRE companies. Also retail spaces are moving towards this business models based on flexibility and use.

Technology is of course one of the main drivers of the process and one of the key requirements in order to make the transformation real. The knowledge of technology and digital realities is something that in general is not owned enough by CRE players. Additionally, the market knowledge is something that has to increase as well as the market response for this kind of services.

Covid-19 stressed a situation that would anyway happen in the near future. Flexible and digital workplaces will be a disruption and companies need to prepare for that otherwise they will be left out of the market. However, the employees need to meet, and meetings will remain important for the people's life. So, one of the goals will be to combine and balance these two aspects, for example with the use of technology, in order to create a digital space together with the physical one to maximize the value we provide for our customers.

Role of Collaborations

Servitization is a massive change and, for sure, it cannot be pursued alone. Working with competitors, partners and customers is fundamental. A first action that our company took was to develop digital solutions with other commercial real estate companies. That's because of the *“need to make the market more mature in terms of awareness and to make it reach the critical mass to build an effective business case”*. Additionally, *“the creation of new companies which are oriented to build the servitization competencies and tools is an approach that our company is testing”*. Collaboration is also with business partners in order to share knowledge and risks.

Startups are clearly one of the partners that can open the most relevant opportunities. Developing business arrangements with these types of companies is important because it strengthens the relation and allows to benefit from each other's strengths.

Even if seminars and intensive communication activities can help to increase the awareness of all the stakeholders about the transformation, the best activity that can generate steps ahead to the goal is to develop prototypes of the possible solution in order to test them and to build a strong business case that can bring everybody in.

The collaboration processes will be important in all the phases of service and building developments. That's because of the knowledge and the interactions that are required to create and deliver services as well as the adjustments that have to be done in order to develop buildings and premises that are suitable for them. The role of all the partners and stakeholders will be relevant also in this preliminary phase where it's important to understand what servitization means and what it looks like in the near future.

The contact with the market is one of the most relevant benefits that we've learned so far in collaborations towards servitization. It's hard for customers to change their approach and to take steps towards something else, but it is not enough. CRE companies have to understand more about this new market.

4.2) Real Estate Divisions

4.2.1) AstraZeneca Real Estate Division – Head of Global Real Estate

AstraZeneca is a healthcare products provider. The interviewee is the Head of Global Real Estate that is responsible for the management of the company workplaces.

Servitization Transformation

Corporate real estate is changing and transforming and one of the main reasons is that the internal customers are changing, and the real estate role is to support them by providing the needed flexibility. As part of the workplace strategy, one of the main indications is the design of workplaces so that they facilitate the business activities and to do so, in a slow environment like real estate, there is the need for anticipating trends really before in time.

When dealing with servitization, it is a radical transformation because it forces companies to collaborate more and with completely new partners. The respondent described that ten years ago, real estate was basically independent while now things have changed and *“the more complex the workplace or facility is, the more there is the need to collaborate”*. One of the main enablers is Artificial Intelligence, that allows much better

data analysis and forecasts that allows to know more about the utilization of spaces, attitudes of employees and facility management issues.

Servitization has also to be intended as a response to changing needs of internal customers. One of the main new demands from customers is flexibility. They want *“buildings that permits them to work cross-boundaries and with different functions contemporarily, in order to optimize times and gain more cross-boundaries knowledge”*. It goes along a more general trend of generating open spaces that allow for a better collaboration and cooperation inside the company. A third implication is related to the facilitation role of RE. Companies are more and more interconnected and therefore RE has to provide all the support to make it easier and more effective for our customers to share and communicate with other organizations and institutions.

In order to effectively transform, a first key action is to develop a deep and accurate understanding of the customer needs. Better communication and increase in the number of interactions are vital to get to know what the customer means when they demand new services. A second element is the cooperation with competitors and benchmarking. That’s because to facilitate cooperation and innovation between customers RE companies and divisions have to provide them with the tools. So being in a network where all the players have the best tools to be an active collaboration player in the market will benefits every real estate customer value proposition. Additionally, the interaction and co-development with internal customer is also really important. There is the need to *“include them in the definition of the long-term facility strategy in order to customize the proposal and to make it closer to their actual needs, increasing at the same time the trust in real estate job”*.

Role of Collaborations

Collaboration nowadays is a must. Industries are changing in their production and delivery dynamics and no company can survive by building barriers and only adopting protection strategies. RE have to collaborate to provide a better service to their customers. For example, the collaboration with other companies and RE partners can create shared facilities for our customers to collaborate and develop new solutions. In our venture hub we’re collaborating with other real estate providers and with our internal customer’s partners and competitors in order to allow our customer to create new solutions for the future. We get access to their knowledge and they get access to ours. Obviously, not all the knowledge is put in common, but the commercial relationship creates a win-win situation. Additionally, there are underused facilities that we can provide to other small companies maybe for a limited period of time or with a non-binding-contract to provide them with the time to build their own or to switch to a longer contract. Our projects received several positive feedbacks from customers, and it gave us the confidence to bring collaboration forwards with the goal to reach more talents and more opportunities.

For what concerns the main partners involve, in addition to the previously mentioned competitors and small companies, Academia plays an important role. For example, *“One of our goal is to bring universities and research centers closer in order to accelerate the rate of discoveries and, for instance, of innovation”*. Moreover, there is the need to involve other disciplines, mainly the ones really digitalized, due to the enormous development opportunities that they can generate. In general, our goal is to look at our supply chain from a broader point of view and try to bring them closer to us, even without a commercial agreement, but just by locations, in order to see if something comes up. It allows to develop solutions together without asking for tools but bringing them to work with the company to create them. Having little or no commercial ties boost a different type of innovation and creativity that is more informal and aims to generate new knowledge from the bottom and the interaction and if it generates business opportunities it can be considered a great result but, if it doesn't happen, there have been no costs and there has been knowledge gain for the organization.

Collaborations is aimed to change the internal culture, to increase diversity but, most importantly, to increase the internal knowledge. We live in complex times where the number of informations and data have become enormous and, for instance, it has become really difficult to include everything that's important inside the boundaries of the organization. Additionally, real estate has to understand that to provide great value for its customers, it has to consider the ways he can support them to win their own market. Understanding not only its customers, but also their customers is really difficult and creates the need for external knowledge to flow in.

For what concerns the concrete benefits, it's important to consider that limiting your possibility to a commercial agreement blocks you to discover new opportunities. In fact, companies bind themselves while open innovation it's all about discovering what happens. For example, our company decided to acquire another not because they had a commercial agreement, but because they talked to each other and it has come naturally to upgrade and work together more closely. Of course, generating the own IP and profiting from it has always been a mainstream strategy, but in the contemporary context things happens faster and the meaning of the commitment to open innovation means that the business case is less relevant, the most important aspect is represented by the opportunity. And if there is an opportunity, there will be also way to share the profits from it. Financials will be different, but the alternative to it is to not succeed and in the future there will be much less control and the duality closeness-openness will be the new driver so the culture of a company will play the same role that contracts used to play to ensure profits flows into the company and not outside.

“The main needs for the future will be a more comprehensive cooperation between not only market players, but involving also public stakeholders and other industries in order to be able to not only to create a sustainable development in the whole society, but also to involve more player and, for instance more resources into the process”, the interviewee stated.

4.2.2) Volvo Group Real Estate – Digitalization Director

Volvo Group Real Estate is an integrated function in the Volvo Group, with responsibility for the entire lifecycle of the Group's properties and real estate assets. The interviewee is the Digitalization Director that is responsible for the digitalization strategy of the function.

Servitization Transformation

The trend of digitalization will produce a massive amount of disruption in the commercial and industrial facilities industry. Even if the real estate sector is in general still immature about this topic, the scenario is changing, and the benefits are becoming clearer day after day.

When it comes to offices, it is becoming increasingly important the role they have in employer branding. Companies nowadays are competing globally for the best talents to get the additional competencies of industry 4.0 and the work environment plays a role in attracting them. It is especially true in contexts of clusters, where potential employees can choose between various companies whose are facing completely new ways of production, it is important to differentiate themselves.

In detail, services offers a great amount of new opportunities and one of the main points of analysis is to understand what really brings value for the business that you serve, which in my case is the automotive, either now either in the long terms, in order to not waste money on fancy things. It implies the need to have a clear and meaningful vision able to face the modern context that is really uncertain and always evolving. It applies to every kind of method of servitization, such as the open formats, and to the drivers, such as IoT technologies that has not to be limited to a process perspective but mainly on the information perspective and on the opportunities that lies ahead this information. The knowledge will constitute the basics for new services, such as optimizing the fire management, ventilation controlling and so on. Additionally, data have to be used with a broader perspective. If they are confined to small and isolated projects, their value will be much lower than in the case of a systemic utilization that goes beyond the business case and open up entirely new benefits opportunities. From a real estate perspective, one of the main possibilities is to be closer to the employees, understand them closely and educate them about “*the possibilities related to the new capabilities provided by technology*”, according to the respondent opinion. To make the transformation effective, there has to be “*alignment between strategy and investments, in order to plan according to the vision and make the company resilient and aware of the direction even when the opportunity seem unclear and smaller steps are more appropriate*”.

Benefits of services can be either direct either indirect. Generally, people tend to see only the direct ones, that may be for commercial real estate companies to diversify their revenues and to increase the rent they get by

increasing the offer. But the indirect benefits play a major role in “*strengthening the company’s brand and the attractiveness they get*”. They add-on elements to a firm’s competitive advantage that are intangible and that operates towards people’s satisfaction by simplifying their days and increase their bond.

Role of Collaborations

Cooperation and networks are really important to facilitate and sustain these types of processes. A major role is represented by the need of standardization in order to make the benefits happen. RE is a fragmented industry compared to others where standardization is more advanced. “*Think about how the role of Amazon has standardized the process of online shopping for customers and how it has contributed to create an ecosystem of products and services related to that*”, the interviewee said. Additionally, networks are useful in order either to build the size of the demand for services that otherwise may not be efficient, either to achieve common social goals like sustainability and social responsibility.

Collaborations can be an extremely valuable source of opportunities as well as knowledge. Through network relations there could emerge ideas and areas of applications that otherwise can be difficult to discover. It happens also because enabling a deeper knowledge sharing also with customers it’s easier to understand their main needs and the main solutions that they’re looking for. For example, when developing a workplace for a company, enabling sharing activities allows the real estate company to understand better the goal of its customer and it helps in developing a more-effective solution. Supplier cooperation allows also to obtain more integrated and optimized solutions, that permits to other resources to move away towards new investments.

A different perspective can be addressed if we consider the thin line between the real estate responsibility and the customer responsibility. It basically means that services potentially allow to not only provide services to the companies, but also for the companies and impacting their customers. One example in the automotive sector can be smart parking, where real estate provides smart management of the parking spots. In order to be able to do it, companies have to develop stronger and closer relations with their customers either internal either external. Another example is increasing the employee’s productivity by providing services that optimize for example their time management. These benefits may not produce a direct effect for the real estate, but they may increase the strength of its value proposition if these services are co-created or co-developed with the users, and it may happen only with an open knowledge flow.

One of the main barriers to open innovation is the risk of sharing the core information of your products or processes. The explanation provided by the respondent takes into account the competitive advantage protection: “*If a company’s competitive advantage is based on vulnerable information that may be captured in the context of open innovation activities, such company will be reluctant to open up its boundaries, while*

in case of no competition, as it is for corporate real estate divisions, the opportunity to sell IP or to let the society improve with their internal best practices has almost no drawbacks”.

4.3) Real Estate Partners

4.3.1) IBM – Technology Executive

IBM is an integrated IT company that offer technological solutions. The interviewee is a Technology Executive that is responsible to establish and develop the company’s relationships.

Servitization Transformation

Commercial real estate business is moving into the service business strongly in this period. The use of their space and their knowledge is going to be different and to play another role in the future. Apps and Logistic services are just two of the examples of the possible applications of this new model in that business.

Another perspective is the role of technology for what concerns the internal processes of CRE companies. They have still a lot of paperwork and new technology and sensors can help them optimizing that and at the same time allowing their resources to be useful in other ways such as discovering opportunities or delivering services. AI capabilities can help to predict a lot of new different things such as what kind of customers to target or what types of services are more appropriate to maximize value.

Additionally, ecosystems can boost innovation in this sector because it allows to imagine and create services that are not imaginable at the moment.

According to the interviewee, in the future the CRE business may be more similar to a *“compromise between Starbucks and Offices, changing the equilibrium and focusing more on the service part rather than on the physical one”*.

One of the main needs of CRE companies is responsiveness and proactivity. Real estate is a slow sector and the methods of work are really consolidated and, therefore, not easy to change. However, the speed of the world’s transformation, the new business models and the unpredictable game-changing events such as COVID-19 determine the need for transformation. For example, if in this pandemic context many companies risk to go bankrupt, CRE companies have to think about a way to help them to survive and to provide them services in order to do so because otherwise they will not be able to maintain or sustain their profits.

Additionally, startups nowadays are far more digitalized and prefer more flexible solutions when it comes to big capital investments such as real estate. *“Of course, there will always be the need for physical space, but*

the amount will be different and it's not improbable that we will see a dropdown in the commercial premises because the new needs can be solved by technology allowing employees to work in cafes. For this reason, CRE companies have to develop workplaces that are attractive to the new demands", the interviewee explained.

One of the main barriers is that things are still working well for CRE, so they don't have the incentive to undergo some major transformations. But this is a bad view because *"now there are many new players with more flexible models that time after time may disrupt the industry making the old business models obsolete"*. Imagining something as an "Airbnb" for real estate that provides the flexibility to rent out premises for a limited amount of time. Additionally, sharing economy based on apps and platforms can provide a better choice opportunity for potential customers that *"can decide the locations and the services they want according to their desires and actual needs"*. It creates an easy process that has the potential to beat the market mostly for the new generations that are less traditional and more adaptable.

Digitalization will play a key role in allowing the servitization transformations, by providing with the tools to make things faster and more interconnected and, to achieve this, you need to develop knowledge and to incorporate it into the company as soon as possible.

Role of Collaborations

One of the main collaborations that are going on between IBM and real estate is in the field of facility management, taking care of interiors of buildings and helping the RE companies with the technological infrastructure. Additionally, there are ongoing projects that are related to the building process automation and digitalization, such as the application of digital twins that enables the creation of a completely digital replication of the facilities which enables different implications. For example, in case of fire, the firemen can see digitally where the fire is and all the peculiarity of the building in order to act better and more safely.

Additionally, there are many other relationships that are going on and that can be a good example of the collaborations between technology and Real Estate. We help them in using technology to improve space and facility utilization, by providing them with the sensors and the software to monitor and gather data, to analyze them and to take better decision to use facilities at full potential. Our collaboration aims also at providing them with the tools to design a better customer experience by combining digital workplaces and, in the future, mobile apps and automated services such as hoteling. Occupant experience is the priority now and the engagement of real estate and technology express a strong effort to maximize it.

For what concerns the main benefits that are originated by these collaboration activities, one of the main things is that they have to be present at both sides. Technology companies have access to new customers and to a

massive amount of data, as well as they get to test their ideas at a larger scale. Buildings are a massive part of our urban environment and therefore they present several opportunities to be exploited. Real Estate get new knowledge and tools for managing their premises, as well as informations about their tenants and customers. The combination of these benefits allows CRE companies to “*discover new opportunities, due to the superior knowledge, and to deploy them, due to the new tools and services they can put in place*”. For example, by involving several new organizations, their spaces become more attractive for their suppliers in terms of marketing expenditures or physical presence, all supported by technologies able to target more effectively.

In the future, one of the expectations is that self-services will become more and more common, through applications or other digital tools that will be created by the companies itself. It will optimize all the energy, security and heating issues in a more integrated view and, in combinations with all the customer data, will generate new business.

In general, open innovation is the best way to explore opportunities for the future. Nobody can be better than ecosystem together and if companies remains in their siloes, they’re going to lose in the long run. Disruption and co-innovation will be generated in ecosystems and their impact is not avoidable from the incumbent. One of the most common application of open innovation happens with startups. Companies feel the need to see what they can do and what solutions they can bring into the table. By working with them, companies can learn new perspectives and there could be new paths to market that are discovered and that can benefit both sides. The main reasons of undergoing open innovation are the speed, either to solutions either to market, the lack of legacy “*which means low pressure and lot of fresh ideas, and open knowledge coming from engineers, entrepreneurs and so on*”. In CRE open innovation has to become mainstream mainly due to the need for standard creation, such as “*team meetings that in order to work have to be based on the same standards, that will define the success of a modern real estate platform from another*”. Another reason is that CRE companies, to fully embrace the opportunities but also to survive, need external resources to be involved because they lack knowledge and because they will need totally new ways to create value and, consequently, profits.

4.3.2) Ericsson – Innovation Leader

Ericsson is an IT company that offers communications equipment, telecom services and support solutions. The interviewee is the Innovation Leader that is operates in the innovation activities at the Ericsson Garage.

Servitization Transformation

New opportunities in service market are opening due to the impact of technologies. 5G for example represent the gateway to various new data and information about different matters, which allows companies to increase their knowledge about their customers and, therefore, to increase their ability to provide them better solutions. One of the applications of technology in the real estate sector is the creation and development of smart buildings. It can benefit a lot of different industries and facilities types. Sensors and real-time data can help not only the optimization of the workplace activities, but they can increase the level of security and the environmental sustainability of the operations by monitoring the wastes and reducing emission. Additionally, these new technologies can help in the creation of new services. In fact, having these informations may represent a source of revenues by itself as well as constitute the elements for workplace optimization consulting services, as well as the energy that is saved or created can be bundled with the ordinary income to produce a more complex real estate offer.

Role of Collaborations

Ecosystems nowadays represent the best ways to make change happen and to develop solutions for the urban development in the digital age. The respondent explained that *“There are a lot of different actors that plays a role when it comes to digitalization of the cities, such as real estate for the infrastructure, telecommunication, mobile operators and technology companies that focuses on the digital software”*. This ecosystem is entirely needed because it’s difficult for companies to acquire enough knowledge to substitute the other members and, for instance, there has to be space for collaboration due to, on one hand, the need to provide services in order to transform the business and, on the other hand, the need to be in the ecosystem because it is the place where things happen.

Innovation activities inside ecosystems helps all the companies in prioritizing their customers in the development process of their offers because it allows the activities to be evaluated under a broader point of view and it gives the company the resources to focus on their core activities leaving the others to the ecosystem itself. Additionally, opening the boundaries and committing to external collaborations help to discover opportunities that otherwise would have been impossible to detect. For example, ICT companies can see opportunities by using real estate infrastructures while, at the same time, real estate can do the same. It changes the role of companies because *“business opportunities can come due to a research activity but also due to a perfect network positioning”*.

Additionally, the ecosystems can change the culture of companies because, by bringing in others and by opening the silos to cross-functional activities, companies are forced to question their ongoing operating model and to adjust it in order to be effective in the partnership. This change in innovation culture is an enormous

benefit for bigger companies because culture is one of the biggest barriers to innovation and it is particularly true in the contemporary context where disruption comes more frequently from quick and innovative startups.

4.3.3) First to Know – Senior Advisor

First to Know is a Gothenburg-based consulting company mainly focus on innovation and sustainable development. The interviewee is the Senior Advisor that is responsible of the activities of creating change inside of the companies.

Servitization Transformation

Servitization is a natural extension of the commercial real estate business due to a couple of reasons. First is that many of them already rent space instead of selling it, which means that providing additional services is easier when it comes to adjust the revenue model and the value proposition to make their customers happier. Additionally, there are a lot of opportunities that exist due to the particular nature of real estate companies with respect to their customers. In fact, CRE companies owns the physical space and all the hardware infrastructure that companies use and, therefore, someone has to take care of all the physical needs such as recycling, logistics and shared machines and facilities. For CRE, it allows for economies of scale and sharing benefits while the customers have some practical issues solved.

One of the main suggestions that technology enables is the similarity with the smartphone industry. Real estate providers will be like the smartphone and all the services will play the same role that apps do, allowing the customer to access a wide range of opportunities according to their needs. Access and flexibility are the main keywords of the future and commercial real estate companies have to, using the interviewee words, *“use their know-how in order to provide the hardware and to accelerate the development of the software providers in order to meet those needs before someone else does”*.

The extend of the change will be various and will regard either the core services either new services. And it is already happening with collaborations with other partners that implement their offering in the areas provided by real estate companies. The challenge is to create it in a more integrated way in order to make it easier for companies to benefit and for customers to get personalized solutions.

Technology and a more customer-centered approach will be the main drivers of the transformation in this industry. They provide the data to take decisions and to co-create the new solutions that are and will be needed by the market. Additionally, they provide the needed optimization to drive efficiency in the organization and to allow resources to flow where the best opportunities are. Another driver of servitization is related to social

sustainability. Kindergartens, washing machines and sport centers are all solutions that may be implemented to increase the work-life balance of employees and to improve their loyalty to the employer.

Culture is the key aspect of transformation. Culture represent the main barrier but also the main enabler for having a successful and effective transformation. CRE is traditionally a really profit-oriented industry and the professionals are really oriented to execute the transaction and not to create relations on the long term. A transition towards softer values and a more customer-oriented approach instead of the transaction-oriented one, is what it's needed to achieve the goal. The steps that companies are taking and that have to be enforced in the future regards the implementation of a stable interaction process with customers, applying methods such as design thinking and lean prototyping, collaborating with PropTech startups in order to access knowledge and tools to create the digital solutions and integrate these policies at executive level by *“creating figures such as CTO or CDO that are in charge to design the innovation strategy and that are enabled to take risks and responsibilities to do that”*.

Role of Collaborations

The process of iteration and prototyping with customers has to be carried out both internally and in cooperation with other partners. That's because *“in the first periods CRE companies may not have neither the technical skills to create and co-develop a prototype neither the cultural and mental approach to question the ideas and to co-create models out with the customers and not in their R&D departments”*. Of course, such collaborations have to be carefully planned in terms of contribution and rewards, but the experience will enable companies to adjust and to operate always better choices.

Collaboration are required for openness, which is required to build effective services and add-ons over the space offer. Real estate companies can't operate all the services and the internal transformations by their own and, additionally, there is the need of a tight cooperation in order to create a full solution that maximize the employee experience in the workplace.

One of the main barriers to collaboration and openness is the traditional organization of companies in siloes that are not so able to communicate to each other.

The respondent explained that *“This structure is always been reflected to the network and collaboration structure, that is always been limited to some specific projects or functions, but in the interconnected world of industry 4.0 interconnections and ecosystems are the basics for a market-winning solution and is big incumbent companies do not exploit their potential they will remain outside the innovation window and it may translate in the loss of their competitive advantage in the long run”*.

Think about the importance of establishing a dominant design or a technical standard in technology, or the market dominance established by Microsoft only by exploiting collaborations with all the actors in the computer ecosystem. Collaboration cannot be “against a common challenge” anymore, but it has to move towards the “discovery of new opportunities”.

In order to apply servitization, it is key to implement tools of design thinking and user-perspective. But to successfully transform the business and move towards the future of workplaces, that’s where open innovation comes into fundamental relevance.

“Innovation and disruptions happen by incident, and therefore it cannot be obtained only by planning a massive R&D investment, but it has to be explored by keeping the doors open and exploring every possibility that comes in. Open innovation represents the best way for companies to create an extended portfolio of options without taking all the financial outflows and operative risks”, the interviewee said.

The key idea to understand it is the distinction between the process of idea generation or problem solving, and the process of innovation implementation. Although the latter needs a structural approach that allow companies to profit from the innovative products, the former cannot be forced. The process of designing a solution is a natural process that requires some condition to be performed but it’s impossible to force it to happen. That’s why companies have only to enable innovation to happen by placing themselves in as many places as they can where it is more likely to show.

5) Data Analysis

The aim of this chapter is to apply the thematic analysis to analyze the empirical findings and to connect them to the literature framework. The goal of the researcher is to create a deep understanding of the data and to generate meaningful insights in order to provide an answer to the research question. The analysis will start by understanding the main perspectives on servitization for what concerns its opportunities and drivers, its key challenges and the consequent transformations. Successively, the main benefits provided by collaboration and open innovation activities will be exposed, together with the main types of activities that are considered more appropriate and the key challenges. All the general findings have been compared to the literature framework while the industry-specific ones have been used to provide practical insights. The latter will be then analyzed by applying the Chesbrough service value web, in order to create a model that incorporates open innovation in the service value creation process. The citations from the empirical data collected are presented throughout this chapter in italics and between quotation marks.

5.1) Perspectives on Servitization in Commercial Real Estate

5.1.1) Benefits and Opportunities of moving into services

When it comes to servitization, the main orientation that emerges from commercial real estate professional mirrors the Roger's definition that tend to identify it as a way for companies to increasingly integrate their products with a set of services aiming to increase their offer (Roger, 2009). In fact, one of the main intentions of these companies is to shift from being pure manufacturers to the creation of more complex and integrated solutions to customer's needs (Manzini, 2003).

There are several benefits and positive impact that companies are looking for when deciding to implement services in their business offer. Swedish firms tend to focus strongly on the impact that the introduction of services will have for what concerns the customer reaction and the relation with them, confirming the Levitt's considerations on the relevance of customer relationships (Levitt, 1983).

One key perspective on the customer's related benefits is the increased loyalty that companies expect from them. The ability of a service provider to increase the number of its customer's problem that it can solve is considered as a way to increase the trust in between and to generate a lock-in effect that prevents them to look somewhere else. This fact mirrors the concept of dependency introduced by Vandermerwe and Reda in the 1988 as one of the main strategic advantages of servitization. An additional effect of the services in this specific industry is that it will allow companies to find a broader customer base. In fact, focusing on people and seeing them as individuals and not just as companies looking for space will make them able to tailor services that will reach a customer base composed by all the employees that everyday walk into their offices.

Customer's related benefits include also services that will not be immediately a source of revenues. For example, allowing "*a tenant to have access to its own customers through the commercial real estate physical and digital infrastructure*" can be a relevant source of value for CRE customers even without a clear monetization system.

A second perspective on the main benefits that companies expect from this transformation is related to the increase and optimization of the revenue streams. A key effect can be identified in the increased perceived differentiation that will lead to higher prices and, therefore, to higher rent income for companies. It is not in doubt that being able to provide a wide variety of services will increase the value of the company's offer and may lead to an increase of the customer's willingness to pay. Servitization can provide two other key advantages related to revenues. One of them is the diversification. In fact, diversifying revenues allows to lower the business-specific risks as well as to create options for future business expansions in other markets. Additionally, generating an increase in revenue streams is seen by companies as one of the best ways to generate the needed cash to be invested in the expensive projects that characterize the industry as well as on R&D departments.

The third main benefit that can be identified is an indirect one. Services "*play a major role in strengthening the company's brand and the attractiveness they get*". The brand equity increase is seen as a potential driver for the market success that can be leveraged with services. That's because of the intangibility of the service value that indirectly plays a great role in increasing the perceived value of the offer and, therefore, of the company by its customers, creating a more intangible competitive advantage for the firm (Hirschl, 2003).

A fourth type of benefits is related to the improvements of the offer due to the implementation of digital services. Digitizing the business and getting information thorough the data collected can help the companies to build digital services, such as space monitoring and optimization. These services increase the insights that the company have about the customers, enabling it to re-arrange and improve even the existing offering. A key aspect that emerges behind the words is the great role that having customers on the spaces owned by the company will have in the process of value proposition definition. As described in the literature, the new technologies may boost servitization by allowing companies to tailor their value proposition based on data (Bustinza et al., 2017), and the possibility to collect them every day in a variety of locations will make the real estate operators in a strong advantage position to do that.

The creation of several drivers of competitive advantage is seen as the key benefit of implementing services in the commercial real estate offering, and there are several opportunities that have been highlighted to serve this purpose. One of the main opportunities that emerged in literature to exploit the service potential is the integration of the new value drivers on the basis provided by the current offering of the firms (Mitchell, 2004).

This is especially true in the context of commercial real estate and, in particular, in some of the main opportunities that lies ahead in the sector.

The creation of marketplaces is one of the main opportunities that originates by the current offering of CRE firms. It could allow target customers to use the space and the tenants provided by commercial real estate companies as a space to get in touch with existing or potential customers and, therefore, to grow their business. This can be extended also to mirror *“winning models such as shopping centers, that leverage services in order to attract more people and more advertisers and get to charge, if successful, higher rents”*.

A second set of opportunities, that are anyway strongly related to the first one, is to use the space as an infrastructure for customers to reach and communicate better with their stakeholders. It includes all the facilitation activities that can be operated by real estate actors, such as the adhibition of structures, as well as changing the equilibrium of the space-services dualism, creating a *“compromise between Starbucks and offices”*.

A third possibility that relies on the core business is to exploit the characteristics of the space usage and management, maximizing the revenues from the core business. It means to see the space as the basics of the offering and enriching it with services such as maintenance and cleaning. It also includes the possibility to leverage sensors and real-time technologies to optimize the workplace utilization as well as to increase the security of buildings and the environmental impact of the emissions.

A totally new set of opportunities is possible if we consider a perspective not limited to what is already provided but extended even to business adjacencies or technological scenarios. Digital application is seen as one of the main possibilities to increase the value of commercial real estate providers and leverage the trend of digital transformations. These digital Apps will allow not only to do the basics functions, such as opening doors or booking rooms, but also to create virtual reality rooms or smart mobility solutions for tenants in the buildings. The key aspect is to see it not limited to a specific project, but to integrate it in different functions in order to increase the opportunities that can be reached in the digitalized world. One example is to develop smart logistics services, that may enable the companies to a more efficient use of their spaces and, at the same time, increase the number of tenant’s problem solved by the firm. Information-based solution is the unifying theme to make customers happier and maximize the opportunities discovered by the firm that can be found in a completely different area than what expected.

The technological solution may enable some sharing economies solutions that may be more flexible and, therefore, appreciated by the new generation companies and startups. That’s because in this context customers *“can decide the locations and the services they want according to their desires and actual needs”*.

5.1.2) Main Drivers of servitization

The reasons behind the servitization of commercial real estate industry are varied but are mainly linked to market-oriented themes and trends instead of internal pressures. This result reflects the basics considerations that emerged in the literature that saw as the main drivers of the process the customer's changes, the technological advancements, the impact of sustainability and the strategical implications.

One of the key trends in customer demands is the increased role of customization (Vandermerwe and Rada, 1988). In detail, the adaptability of the service component enables firm to add functionalities in order to better solve customer's problems (Baines et al., 2007). In the context of commercial real estate, one of the main needs that current customers have is flexibility. In particular, the tenants demand a workplace that meets their changing conditions and that is able to adapt to the situations and challenges that the company is facing. Additionally, the new generations of companies, such as startups, demands flexibility not only to support their operating model, but also to lower the fixed costs in order to focus on their business growth. It forces the CRE companies to adapt because *“there will always be the need for physical space, but the amount will be different and it's not improbable that we will see a dropdown in the commercial premises because the new needs can be solved by technology allowing employees to work in cafes. For this reason, CRE companies have to develop workplaces that are attractive to the new demands”*.

An additional fundamental need that customers are facing nowadays is to have a workplace that is fully digitized enabling them to *“deal with extraordinary situations, such as the COVID-19 outbreak, or to adapt to a more flexible and versatile type of work not anymore office-dependent”*.

When it comes to offices, the companies see them as a driver for increasing their employer branding to attract the best talents, especially to develop the rare competencies of industry 4.0. For this reason, providing services that improve their quality of life and let them live a workplace experience that is superior to the competitors is considered as a top priority for companies when choosing a commercial real estate provider.

According to Vandermerwe and Rada (1988), the greater availability of information together with their changing businesses lead customers to demand a more complete and integrated solution that applies to the entire organization. In the commercial real estate context this need is conceptualized in a similar way, with a focus more oriented to the cross-functionality. In fact, one of the key needs of nowadays customers is *“buildings that permits them to work cross-boundaries and with different functions contemporarily, in order to optimize times and gain more cross-boundaries knowledge”*.

Technology is definitely another key driver for servitization in commercial real estate. According to Vandermerwe and Reda (1988), technology enables firms to exploit and distribute services instantly and, with the potential of the new interconnected systems, has better chances to deliver them directly in the homes of the customers. In commercial real estate it not only means the ability to access customers and tenants in a

more direct and quick way with respect to the past, but also to provide services to segments that were previously more difficult to reach. That's also because of the increased forecasting capabilities that sensors and data provide to companies, enabling them to "*know immediately, and even predict, the needs of people*". Additionally, technology can make the offer of commercial real estate better due to the optimization possibility given by the informations collected by sensors. This capability, combined with the interconnections that digitalization is able to provide, will make the company's services closer to customers, boosting servitization by allowing firms to base their service value proposition directly on consumer's data (Bustinza et al., 2017). A third aspect of technologies is their ability to optimize the internal processes of companies, making them slimmer and helping the firm to become more agile. The back-office optimization will help also to drive resources where the best opportunities are.

Technological development will play a strong role even in enhancing the interactions and collaborations with customers. Tools such as digital twins and prototyping will help companies to better design and co-create services that solve customer needs.

For what concerns the specific technologies, Wilkinson et al. (2009) considered the advancements in transport and communication technologies as the main drivers of servitization, while Bustinza et al. (2017) saw the Internet of Things as the main enabler of data-driven services. According to the results, communication connectivity improvements due to 5G introduction will increase the knowledge communication speed and the IoT will provide the basic tools to create digital services. In addition to them, another technology that is seen as relevant for servitization is the Artificial Intelligence. This technology can improve the data analysis process and to provide intelligent forecast based on learning a massive quantity of data.

According to the literature, Sustainability is seen as a driver mainly because of the value it has for social stakeholders (Baines et al, 2007). More specifically, services are considered a way to reduce wastes because they enable to re-use, re-cycle and reduce the used materials (Mont, 2002). Additionally, services can produce an increase in jobs that can balance the reduction in occupation that is happening in manufacturing (Mont, 2002; Manzini et al., 2001). In the context of commercial real estate, the main outcomes of the research are a little bit different. Sustainability is a key driver of this process but the benefits and the opportunities are not the ones exposed by the scholars. For what concerns the environmental impact, the main opportunity is to use the space in a more environment-friendly way by renting out roofs or walls to solar panels or greenhouses. The expected social benefit is not related to the job creation, but to increase the work-life balance of employees as well as to simplify their access to basics but important services such as kindergartens and sport centers.

The strategic driver, that is really important in the literature, is not considered a key enabler of servitization in the commercial real estate sector. The first reason may be the intention to produce competitive advantage is mainly seen as a consequence of the process, and not as a driver or force. A second reason is related to the different approach to competition that CRE professional expect to see in the servitization transformation. In

fact, one of the main considerations is that “*companies need to overcome the idea of the first who comes, fill the patent and keeps the innovation for himself*”. Additionally, the competition has to change to meet the challenges of the future that will require a different level of cooperation. One of the ideas supporting this argument is that “*there are big projects and challenges, such as smart cities, that imply a higher level of trust and collaboration from RE companies*”.

5.1.3) Challenges and barriers of service implementation

One of the main literature review outcomes is the identification of two main categories of servitization barriers. The first one is the internal-related challenges, that are mainly concerned with the resistance that take place inside the companies. The second barriers are the external-related ones, which are mainly based on the value that customers perceive (Baines et al, 2007).

According to the empirical data collected, one of the main internal related challenges identified by the managers is the cultural shift that is required in order to embrace servitization. In fact, it is a common opinion that the real estate mentality has to change. The sector has always had a transaction-oriented mindset, with a clear and absolute focus towards the space and an orientation on clear and simple leases contracts. What is required to embrace servitization is a shift towards a more entrepreneurial behavior with an increased attitude to take risks and responsibilities. The new mindset has to be customer-oriented, and “*companies have to think about how they can do business with the requests coming from the customers, instead of focalizing on what they actually offer*”. It also implies that the main need will be to organize and orient the business without thinking only about corporate customers, but instead incorporating an interest towards all the people that come to work every day in their premises, learning how to best take care of their needs and optimizing their time. The need for developing a service-oriented mentality has been explored widely in the literature and one of the main consequences that this process can imply is the increase in conflicts with a pure manufacturing mentality (Bowen et al., 1989) as well as the resistance to change that is originated by the power dynamics within organizations (Kotter et al., 1989). These perspectives may explain the relevance of cultural changes in the priority scale of real estate managers and the emphasis that is required in order to correctly address this challenge.

Additionally, to be able to implement such a change in mindset, what is required is much more proactivity and speed to continuously assess the drivers of value in the new market.

A second set of challenges that is clearly going to affect the servitization transformation of commercial real estate companies is the development of the new knowledge and expertise that is required to move towards a

service-oriented business model. In literature, there are several capabilities that have been considered a requirement to provide services and these ones have been categorized according to the dynamic capabilities' framework in sensing, seizing and reconfiguring capabilities. The empirical findings however showed a great interest for the first category while expressing little or no interest in the other two. This may be explained by the early stage of the servitization process in the industry, that makes the managers to focus mainly on those capabilities that are needed to understand the opportunity and the potential of the transformation to gain credibility and commitment inside the organization. In detail, a deep market understanding is seen as one of the most relevant knowledge to develop, in order to clearly assess what drives value for the customers. CRE companies have to put themselves in the shoes of their customers and that's the only way managers believe will help them to develop really meaningful services. Additionally, the second big gap in terms of know-how is in relation to technology. The majority of managers believe that real estate companies don't have enough knowledge about tech trends and therefore it will be required to gain it in some ways to truly exploit the opportunity of servitization. This is in line with the relevance of technology as a driver of the transformation in the sector and will therefore require a clear strategy to overcome this limit.

One of the most famous barriers to servitization has been introduced by Gebauer et al. (2005) and is called the "Service Paradox", that is basically the inability of a manufacturing company to fully commit to become a service provider. This situation will lead to a greater uncertainty and a loss of trust in the actions of the decision makers (Gebauer et al, 2005). In the commercial real estate context, building commitment inside the organization is seen as a key challenge to really make the transition effective. In detail, there are two main barriers that emerge. The first obstacle is identified in the good results that the ordinary business has always had. It created some sort of path dependence that basically diluted any incentive to pursue a business transformation, even if "*there are many new players with more flexible models that time after time may disrupt the industry making the old business models obsolete*". The second need that companies see is to balance the two businesses in order to allow the development of the new one without increasing the power struggles.

A fourth level of internal barriers is represented by the definition of common practices within the industry. Even if the environmental complexity is seen as one of the key challenges in literature, due to the increased number of competitors and levels of value chain (Vandermerwe and Rada, 1988), in the commercial real estate industry what is perceived as a challenge is slightly different. The main concern is related to the need for standardization that can be obtained by bringing as many players as possible into the service context. In fact, "*being able to provide standardize spaces allows to shorter the time of the leases and to easily re-arrange the space for upcoming tenants*". It creates the need for companies to at first attract and find incentives for other companies to participate, in order to create platforms that allows for interactions at broader scale, and then differentiate themselves inside of the networks to generate competitive advantage.

These findings are in line with what emerged in the driver analysis and reflect a particular perspective of Swedish companies. As a matter of fact, competition-oriented benefits have not emerged as particularly relevant and this helps to understand that companies believe that cooperation is a key component in creating change within society and therefore prefer to focus attention not on how to prevent competitive reactions but on how to make such projects more attractive on a large scale.

For what concerns the external-related challenges, the main obstacle for the effective commercialization of a PSS is the cultural change that is needed by the customers when it comes to place value on services rather than on products (Goedkoop et al., 1999; Manzini et al, 2001; Mont, 2004). This problem is perceived even in the context of commercial real estate and, therefore, one of the key actions that have to be carried out is to educate customers and make them clearly and deeply aware of *“the possibilities related to the new capabilities provided by technology”*.

5.1.4) Main transformations and responses towards servitization

Considering the challenges that servitization presents and the opportunities that lie ahead companies have to change their approach and there are several actions and strategies that have been prioritized to reach the goal.

A key transformation that commercial real estate companies are undergoing is about their relationship with customers. In detail, customers are seen as a major driver for servitization and the ability to know them more and to cooperate with them in a tighter way is seen as the main challenge to be faced in the process. For this reason, a fundamental step is to know them and, in particular, to know their business better than before in order to anticipate the trends in their industry. That’s because these are the main drivers of their needs and being able to identify them will allow real estate companies to adapt their solutions faster. *“The goal for CRE companies is to be really close to customers, in their pockets and in their phones. The company needs to understand what the customer does, where do they live, which transport do they make”*.

A second step in the transformation of customer approach is to re-imagine their role and their constitution. In fact, one of the most relevant perspectives is to stop thinking only about companies looking for space and to focus the attention to the tenants, knowing their habits and needs to bring them in the co-development process. CRE companies think that their role will not be limited to be suppliers but have to become partners of their customers to benefit more from the interactions.

A third level of approach is to include customers more in the internal firm processes. The key approach to win the servitization challenge is to *“include them in the definition of the long-term facility strategy in order to*

customize the proposal and to make it closer to their actual needs, increasing at the same time the trust in real estate job”.

This result clearly reflects the Chesbrough consideration on the need for companies to move away from a traditional value chain to a more customer-centric value web that sees as the main value driver the interactions with the customers and the iteration of the process (Chesbrough, 2011). Additionally, the system-thinking approach that goes beyond the simple buyer-seller relation described by Baines et al. (2007) is reflected in the priorities of these companies when it comes to the definition of the customer role in the future.

A second action that has been prioritized is the development of a strong workplace expertise. That’s mainly because the increased flexibility demanded by customers and the extraordinary circumstances of the COVID-19 have clarified the strong need to clearly focus the value proposition of commercial real estate companies on the field of knowledge where they excel: the workplace.

This element is strongly linked to the previous one because it has the aim to constitute the two key element for a successful market approach: if the knowledge of customers will help the companies to figure out what they need, the workplace expertise will be the main element to clearly provide them with a quick valuable solution.

In detail, the development of that expertise has to come together with the infrastructure mindset. Commercial real estate companies own the space that represents the hardware, and therefore the challenge is to develop the software to truly increase the value and monetize the most. Additionally, another perspective is to use the infrastructure to play a role in the ecosystem: *“use their know-how in order to provide the hardware and to accelerate the development of the software providers in order to meet those needs before someone else does”.*

A third response is a strong willingness to bring as many companies as possible in the process to benefit from several factors. Collaboration is seen as one of the best ways to deal with the complexity of real estate environment. Digitalization and interconnection of systems have increased the variability and the number of factors impacting the business and, therefore, *“the more complex the workplace or facility is, the more there is the need to collaborate”.*

Additionally, the strong need for standardization is a key element that pushes companies to collaborate more and to benchmark each other in order to develop a joint and simplified solution for the customers. If flexibility is needed across multiple providers, it will be mandatory for commercial real estate operators to guarantee the portability of tools for their customers.

Diversity is seen as a resource due to the novelty of the market and to the relative incompetence that real estate companies face. In fact, bringing together many different actors enable a better scan of the markets and, therefore, unveils a vast majority of opportunities. Finally, companies believe that a condition to effectively create services that will capture the market is the need to work together with customers in an iterative and

interactive way, applying concepts like design thinking and prototyping that will help the real estate companies to accelerate the learning curve.

One last relevant transformation concerns the internal organization and, in particular, is aimed to build commitment inside of the company. As we've seen, commitment represent a strong barrier because it's not easy to achieve and it may face some strong forces working against it, such as power dynamics or resistance to change (Kotter et al., 1989). For this reason, companies see the need to take two main actions that will help to orient the efforts towards this common direction. A first set implies the analysis of investments and strategy towards servitization, to orient the entire effort towards a shared and achievable objective. The goal has to be to reach "*alignment between strategy and investments, in order to plan according to the vision and make the company resilient and aware of the direction even when the opportunity seem unclear and smaller steps are more appropriate*".

A second element is the introduction of professionals inside of the company that not only have the required responsibility to have an impact in the whole organization, but also that are allowed to take the necessary risks in order to explore the opportunities of servitization. Commitment at all levels of the company can be reached if the executive board agrees on "*creating figures such as CTO or CDO that are in charge to design the innovation strategy and that are enabled to take risks and responsibilities to do that*".

5.2) Role of open innovation and collaboration strategies

5.2.1) Benefits and objectives of collaboration practices

Collaboration activities are widely considered a fundamental condition to make servitization happen for several reasons. There are five main categories of benefits that are recognized as achievable through collaboration and that are fundamental in order to mitigate the barriers and to solve the most important challenges of the process.

A first type of benefits is associated with the ability of collaboration activities to share risks within the interested organizations. In fact, servitization means to enter in a completely new market where not only the dynamics are to discover, but it's unclear what the reaction of customers and stakeholders will be. Additionally, there are several costs that companies have to sustain to develop the capabilities needed to win the market as well as the technologies to create the services. This type of collaboration effect is widely confirmed in the literature thanks to the contribution of Mathieu (2001) as well as the Neely's analysis on the reduction of fixed costs as an incentive to external capability development (2008).

A second category of benefits is represented by the ability of collaboration and network creations to facilitate the creation of standards. As we've seen, standardization is useful to create and facilitate the service utilization as well as to build the needed critical mass to commercialize effectively the new offers. It reflects the considerations of Lutjen et al. (2019) that considered the network a key resource due not only the expertise of diverse players, but also for the possibility to access the partner's network.

In detail, in the commercial real estate scenario a first role of collaboration is the creation of the market. Managers see the need for a common standard to mirror other industries best practices, such as *“how the role of Amazon has standardized the process of online shopping for customers and how it has contributed to create an ecosystem of products and services related to that”*. Additionally, standards are needed to make technological services work. As highlighted by one of the partner's manager, there are services, such as virtual team meetings, that *“in order to work have to be based on the same standards, that will define the success of a modern real estate platform from another”*.

The building of a critical mass for services commercialization is vital to ensure the profitability of the new business and, therefore, the commitment of the companies to it. For this reason, companies believe that working together is the best way to generate benefits for all the player in the industry that will implement servitization.

One of the main benefits generally associated to open innovation activities is its ability to create opportunities to IP selling through partners in case of either it doesn't fit the seller's business model, either the seller has not

the capabilities to do it on its own (Chesbrough and Garman, 2009). This findings add a different perspective because, even if it confirms the existance of benefits of having partners for the sellings of companies, the main focus becomes not to find a better path for the IP, but to access enough customers to make an idea grow and develop until it's able to find a market by itself.

A third key benefits that companies see coming from a more open collaboration environment is related the culture change. In fact, many companies agree that increasing the level of collaboration and opening their boundaries will help them developing a service-fit culture better than what they could've reached alone. Scholars have pointed out this benefit, discovering that openness was a key characteristic to discover new opportunities and trends in the market (Lutjen et al., 2019).

In the context of real estate, collaboration is seen as an enabler for the culture change due to its ability to force the companies to open up their "siloes" and, therefore, expose their operating model to the network. It will make firms question and test their operating model and for this reason will force them to adopt a change-oriented mentality in order to fix it whenever needed. Additionally, the diversity that originates from collaboration is seen as a benefit for the new market dynamics.

Collaborations is a key resource also for the design of new services. Being part of networks is a source of advantage when it comes to leverage the other companies' expertise to provide services for the tenants. One example is "*how important the network of investor could be for a CRE company whose tenants are startups*". Some kind of cooperation and open innovation partners are considered to be more relevant to produce the desired cultural shift. Startups, in particular, are considered one of the key partners due to their ability to create the speed that big businesses don't have, shortening also the time to market. Another benefit associated with the startups is their role in helping companies to change their focus, in particular "*to establish a customer-oriented way of thinking rather than a profit-oriented one*".

The increase in knowledge and expertise is another fundamental benefit from cooperation and open innovation activities and is probably the driving factor that firstly pushes companies to look for external partners to cooperate in projects. Leveraging other companies know-how is relevant because it helps companies to "*expand the knowledge... beyond the pure building or providing space*", helping them to develop the needed skills to face an entirely new market and start building a level of competencies beyond the core business that can sustain the expansion activity in the long run. It may provide companies with the tools to look for their complementary assets, which are synergy-priovider assets that exist outside the boundary of the firm and that can generate competitive advantage (Teece, 2007; Daliwal et al., 2011).

A second benefit of the knowledge that may be accessed thorough collaboration is the possibility to know the customer more than before. In fact, in commercial real estate it has an high proirability that the partners firms are at the same time the customers and engaging with knowledge sharing with them can provide to real estate

operators many valuable insights about not only the potential service drivers, but also about their customers that represent the key source of every need they will have.

An additional advantage in terms of knowledge is related to the possibility to better learn and exploit technological opportunities for non-technological firms. According to the theory, one of the main benefits of the outside-in open innovation processes is the possibility to extend technological opportunities to better exploit growing markets (Wu and Shanley, 2009). It is true for commercial real estate companies that establish technological partnerships in order to “*discover new opportunities, due to the superior knowledge, and to deploy them, due to the new tools and services they can put in place*”. Additionally, collaboration enables real estate companies to get the technologies and the sensors to monitor and therefore get a massive amount of informations about their customers behavior and the way premises are used.

Technological expertise and the ability to outsource many aspects of the service development ability, which allow the companies to focus on their core activities, enables commercial real estate firms to better prioritize customers and design an optimized customer experience.

A final key advantage that companies look for when structuring and implementing an open innovation strategy in the context of servitization is the capability of collaborations to generate a broad portfolio of opportunities for the firm. According to the theory, there are two main benefits associated with the opportunity creation through collaborations: the possibility to generate several real options, such as to delay the financial commitment or to anticipate the exit from a market, and the ability of the network to reduce the bias when evaluating the opportunities (Vanhaverbeke et al., 2008; Lutjen et al., 2019).

The first benefit is widely recognized by the commercial real estate managers that pursue collaborations primarily to open the doors to as many opportunities as they can. Openness and closeness between companies is seen as an enabler to discover things when they come, and this is especially true in new contexts where “*business opportunities can come due to a research activity but also due to a perfect network positioning*”. A key consideration of the collaboration role comes from the nature of innovation itself: “*innovation and disruptions happen by incident, and therefore it cannot be obtained only by planning a massive R&D investment, but it has to be explored by keeping the doors open and exploring every possibility that comes in. Open innovation represents the best way for companies to create an extended portfolio of options without taking all the financial outflows and operative risks*”.

The bias reduction in opportunities valuation has not been taken explicitly into consideration in the data collection. That’s mainly because of the companies’ relative early stage of involvement in the servitization process as well as their inexperience with such open approaches. This made the companies’ focus mainly on the opportunity to be generated and not to the valuation phase that comes next.

An additional way that will enable companies to discover new opportunities is through a tighter collaboration with customers. Involving them from the early stages and learning from them during the whole process allows to iteratively test many hypotheses and to discover new needs and new methods to provide solutions.

5.2.2) Main challenges for open innovation adoption

As exposed in the previous sub-chapter, collaboration and open innovation activities are expected to bring many benefits to make companies ready for servitization. But these kinds of activities present several challenges and barriers, especially in industries that have traditionally preferred a competitive approach rather than a cooperative one, like the real estate.

In the BeCo framework developed by Greco et al. (2019), there are six main costs associated with open innovation practices, and some of them are considered relevant even by commercial real estate managers. One of the barriers exposed in the model is the increased costs to negotiate supplying terms, that refers to the costs to make the partners truly share their knowledge in order to make the partnership work (Greco et al., 2019). In the real estate perspective, this challenge is associated to the clarity that is required in the planning process of the collaboration. To make the partnership work, it's important to define clearly beforehand the benefits that are expected by the activity. It refers not only to the financial ones, but also to all the indirect benefits such as knowledge gaining and reputation improvements. It's important to create the conditions that allow the activity to be a win-win collaboration, in order to build commitment in it and to avoid opportunistic behaviors. Finally, contribution and rewards have to be stated clearly to balance the expectation and better manage the results. Companies have to carefully evaluate the collaboration activities and match them with the current needs depending on the stage of the servitization process and on the type of initiative undergone.

A second main barrier to the implementation of open innovation strategies is the need for companies to protect the core intellectual property. That's because opening the boundaries is a great risk for those companies whose competitive advantage is based on the secrecy of some vital information and, therefore, there is no incentive in doing it. According to the BeCo model, two of the main costs of outbound open innovation processes are the costs of IP protection and the undermined competitive advantage of the firm (Grieco et al., 2019). These can represent a strong barrier to more open collaborations because it applies not only to the servitizing real estate companies, but also to basically every potential partner company, creating an external constraint that may harness the ability to engage in really meaningful partnerships. That's because *“If a company's competitive advantage is based on vulnerable informations that may be captured in the context of open innovation activities, such company will be reluctant to open up its boundaries”*.

A key challenge that can help to overcome that barrier is to engage in really attractive networks. Creating tangible and meaningful benefits for companies that take part in it. The goal will be to bring as many companies as possible to cooperate in order to create value within the network that overcome the costs of IP sharing.

Another class of challenges associated with collaboration activities are the creation of the organizational readiness that will enable the company to fully exploit the benefits of open innovation. In fact, another key cost associated with inbound practices is the identification and absorption of external knowledge (Greco et al., 2019). In the context of real estate servitization it translates in some key challenges. The first is the creation of dedicated teams that are responsible and accountable for these activities. Dedicating members of the organization to open innovation will give importance to these activities and will constitute the first block of its future success. A second element is the creation of commitment in all organization. Being able to embrace the openness is not automated and *“when it comes to evaluate the future use of the knowledge generated, all the company should be committed to embrace and discuss it, according to the areas that these disruptive ideas affect”*.

A third aspect that have been extensively discussed by commercial real estate managers is the need to overcome the silos that prevent knowledge flow within the organizations. It is a challenge related to collaboration because *“this structure is always been reflected to the network and collaboration structure, that is always been limited to some specific projects or functions”*. Overcoming such siloes is therefore a key challenge that has to be won in order to truly extend the benefits of ecosystems and open innovation activities to all the organization.

5.2.3) Main types of open innovation and collaboration approaches

Open innovation activities are characterized by the central role of the knowledge flow, by the exploitation of different sources and by the innovation path that permeates the boundaries of the firm in an inbound and outbound movement. One of the key contributions to understand the flows of the open innovation processes is the framework of Gassman and Enkel (2004), that identifies three archetypes of open innovation processes. The *Outside-In* flows that represent the knowledge that enter into the organization after being developed outside. The *Inside-Out* processes describe the externalization of internal knowledge aiming to find a market. The *Coupled* activities aims to combine the two aspects creating an ecosystem of sustained innovations. According to the information gathered, it is possible to describe how the commercial real estate environment is doing or prioritizing mainly inbound or coupled activities, without really considering the inside-out processes. A possible reason for that is due to the relatively low level of innovation activities that have been historically carried out by the industry. It forces the companies to focus on how to generate new innovation rather than how to profit from the unused ones. Additionally, the early stage of servitization process creates the condition for the research of the new knowledge needed to enter in the new market, without leaving too much space for the externalization of the already existing IP.

For what concerns the Inbound collaboration activities, there are several types of collaborations that have been considered as interesting by the real estate companies and partners. A first example is the spot events, which refers to one-time contests that enables the company to scout ideas in the market. An example that has been provided is hackathons that are considered interesting because *“they allow to focus on a specific topic”*.

A second type of inbound collaboration is represented by all the activities that involve interrelations with customers. They represent the key element to involve making servitization work and, therefore, such activities represent a key priority for managers. Some activities could involve more frequent communication and idea exchange, which allow companies to know more about their situation and their needs. Additionally, these types of collaboration enable the companies to get closer to the demand by increasing the touchpoints and may help them to develop innovative ways to solve the problems. An example provided was a *“crowdsourcing experiment when it was asked to people to complete projects for their home by their own, in order to come up with creative ideas that could be scalable”*. Another element to consider when dealing with customers is the opportunity, by increasing the intensity of interrelations, to increase their awareness about the transformation that is happening and taking a first step into getting their support to it.

A third type of activities that have to be carried out is prototyping. Get customer’s feedbacks early on in the process is seen as a great opportunity to arrive to the market with a ready product that may find its space immediately. Additionally, the role of external partner is really important in this process because *“in the first periods CRE companies may not have neither the technical skills to create and co-develop a prototype neither the cultural and mental approach to question the ideas and to co-create models out with the customers and not in their R&D departments”*.

The coupled open innovation processes are also considered as vital to make servitization not only happen, but also be sustained in the long run and, therefore, generate the desired economic and social impact.

The first type of coupled activities involves the creation of networks or ecosystems of many different players that may play a role in the process. Networks are seen as the only diverse enough source for the knowledge and expertise needed to create services that goes far beyond the core business of commercial real estate companies. Additionally, they provide the mass that is needed to create the standards to build demand, and enough resources to share the risks. In fact, *“collaboration can boost innovation because this solution can be seen as risky in some perspectives but, if there is a network of Real Estate Companies, it will create a standard that will be difficult to put aside”*. Ecosystems represent a vital organization when it comes to vast-scale urban projects, due to the diversity of partner involved and the variety to elements that have to be taken into considerations. One example is urban development issues such as smart cities, where *“there are a lot of different actors that plays a role when it comes to digitalization of the cities, such as real estate for the infrastructure, telecommunication, mobile operators and technology companies that focuses on the digital software”*.

A second type of collaboration interrelation between companies is represented by clusters. The main benefit associated with this kind of structure is the physical closeness between companies that enables a deeper knowledge sharing and co-creation. Clusters are seen as an opportunity to guarantee also the talent attraction that companies hope for to acquire the new skills for the service market.

Networks and clusters will enable the creation of open spaces and shared facilities that may represent the final and tightest type of collaboration ecosystems, where companies cooperate side by side to common projects. It will enable the partners to learn from each other at unprecedented pace and to understand each other better, enabling the possibility to co-develop innovation outcomes that truly benefit all the parties involved.

For what concerns the inside-out processes, real estate companies mentioned the role that activities such as corporate venture capital or acquisitions can play in order to open new markets for their innovation activities. However, at this stage of the process, the managers mainly see these kinds of activities as ways to strengthen the relationships with other partners and to increase their know-how about services. In fact, as exposed by a manager, “*the creation of new companies which are oriented to build the servitization competencies and tools is an approach that our company is testing*”. It places this kind of activities towards a more inbound perspective, with the possibility to become either outbound or coupled in the future.

A last consideration can be done in relation with the collaboration modes analyzed in the literature review. Even if there are not so many information and the entire process is still not mature enough to determine which type of collaborators real estate companies may be, there are some preliminary elements that suggests that such companies may prefer the collaboration types that don't necessarily involve heavy monetary transactions. Confronting the empirical data collected in this research with the collaboration model developed by Dahlander and Gann (2010), it is possible to argue that commercial real estate companies may fit into the two categories of *Sourcing* and *Revealing*.

For what concerns the former, the managers interviewed agreed to consider that increasing the closeness with other companies and tightening the relationships with customers are the main paths to follow in order to implement servitization. Their main objective is to scout the ideas into the market to integrate them into their knowledge and consequently co-develop a solution that may work. The closeness and the creation of win-win collaborations seems the preferred way to get to their goal, not the monetary transactions typical of the *Acquiring* mode.

For what concerns the latter, what emerges clearly from the interviews is that companies aim to collaborate to generate new knowledge that makes them able to create and deliver the new services, and that they intend to do it in the context of strong networks. It means that their primary goal is not to outsource their IP as soon as they can, but to use it in order to open new opportunities for the future and to make the other companies in the network benefit from it, increasing the attractiveness of the ecosystem at the same time. Therefore it seems

more probable that at this stage of the process the *Revealing* trait to look for indirect benefits of innovations is fitting the real estate environment more than the *Selling*'s aim to quickly find a profit from it.

5.2.4) Potential partners for servitization

The partner selection is of course a critical decision when it comes to planning and implementing collaboration strategies. One of the main findings of this research is the willingness of commercial real estate companies to not bind themselves to only a specific type of complementary knowledge, but to adopt an holistic view to bring together as much diversity as possible: *“the main needs for the future will be a more comprehensive cooperation between not only market players, but involving also public stakeholders and other industries in order to be able to not only to create a sustainable development in the whole society, but also to involve more player and, for instance more resources into the process”*.

One of the classifications of the possible collaboration partners divide them into two main categories: the *market-based*, which are mainly customers, competitors and suppliers, and the *science-based*, which refers to research centers and universities (Danneels, 2002).

For what concerns the market-based partners, a primary relevance is held by the customers. The role they can play in the servitization process of commercial real estate is two-sided. On one hand, they can help the companies by being involved from the early stages into the co-creation and co-development process of the services. On the other hand, customers may provide the services that companies are looking for. An example that has been provided takes into account the hotel business, because *“this customer could provide several services such as food delivery, to tenants, increasing their customers and the value that the real estate company provides to them and to the others”*.

Competitors also play a major role in creating the conditions to make the servitization transformation happen. In fact, their role may vary from the creation and destination of facilities and spaces to the creation or delivery phase of the service offering, to the effort in the co-development of the solutions due to resources and scale, which will help to meet the *“need to make the market more mature in terms of awareness and to make it reach the critical mass to build an effective business case”*. Additionally, partnering with competitors is fundamental when it comes to large-scale urban development projects.

Suppliers have not been explicitly mentioned by the respondents, but there have been proposed two specific types of external companies that will play a major role to enable the incumbents to transform: startups and IT companies.

For what concerns the former, startups are seen as key partner to collaborate with due to the different mindset that they bring to projects as well as the different speed that they are able to transmit and that big companies are not. For example, they can bring different ideas when co-creating and testing the projects, such as in the case of the development of minimum viable products instead of presentations: *“we had few time and we focused not on the realization of a PowerPoint that could explain the project, but we developed a basic version of the idea in order to show it directly”*. Additionally, companies can benefit from the new opportunities that can emerge in the discussions with this entrepreneurial context and from the cultural change that they can cause in big companies due to their lack of legacy, *“which means low pressure and lot of fresh ideas, and open knowledge coming from engineers, entrepreneurs and so on”*.

Technological companies on the other hand, represent a viable option for the development of the knowledge and competencies that are required to leverage digital services. Additionally, they will provide the tools and the technologies to make the transformation happen.

For what concerns the science-based partners, Academia is the one that has been mentioned. The role of this kind of partner appear to be more limited with respect to the market-based ones, but will be anyway of great importance to create the cross-boundaries knowledge that will be required and to make the innovation activities to become faster and more relevant: *“one of our goal is to bring universities and research centers closer in order to accelerate the rate of discoveries and, for instance, of innovation”*.

5.3) Value creation in services: a collaboration perspective

As we've discussed in the literature review, the shift towards services implies a radical transformation of the value-creating activities that will move from a product-thinking to a system thinking that will see the customer as the main actor (Baines et al, 2007). The model that aimed to capture the new requirement of the value creation and that is designed to replace the porter's value chain in the service context is the service value web, developed by Chesbrough (2011), which is constituted by 5 steps that have a circular shape, meaning that it's an iterative process, with the customer experience as the catalyst of all the value creation.

The discussion of the model in the commercial real estate industry is discussed step-by-step in the following paragraphs and is represented in a visual way in **Table 2** at the end of the chapter.

5.3.1) Technology-enabled customer engagement

By convention, the first process of the service value web is customer engagement. It means all the activities that will create engagement between the service or servitizing company and the customers, in order to increase the company knowledge of the demand.

In the commercial real estate context, this step is fundamental to determine the most relevant needs of the customers as well as to get the information to predict the way they will change in the future. In the actual context, technologies can help the firms by providing them with a series of tools and products that will increase the data about the customers either in terms of needs, either in terms of behavior, analyzing the utilization of the premises and the interactions that happens. At this stage, some of the key challenges for companies that wants to provide services are related to the development of the required knowledge as well as the identification of multiple touchpoints with the customers. Culture will play a role in the process, due to the need to focus on the people rather than just on the companies, which will enable the firm to re-orient the effort when gaining data. Additionally, the challenge will be to develop and implement the digital sensors and data analysis tools to get the information in real time and to use them as a source for service development, because "*it exists digital platforms that grant the access to customers and tenants*". Technologies will help also to implement digital touchpoints that will increase the number of supplier-customer interactions.

Open innovation activities can have a huge impact at this stage, due to their ability to engage customers either as people either as companies. Networks and ecosystems can increase the number of customers that may be addressed and will provide multiple touchpoints with the companies, due to the large set of activities that may take place within its boundaries. Additionally, spot events such as hackathons can help the companies not only to generate new ideas, but also to generate interactions and specific insight about the behavior in certain

specific situations. Another example of similar activities is crowdsourcing, that will represent an excellent way to engage customers and gain new perspectives from their side.

Startups will also play a role in this process, due to their different mindset and the possibility to create totally new approaches to customers.

5.3.2) Leverage open spaces for co-creation

The second stage of value creation process is the co-creation. At this point, the collaboration with customers reaches the next level and will translate it into a concrete product or service design.

Prototyping will be a key method in this activity, because it will enable the company to leverage not only the customers ideas, but also the other partners expertise that will add value to the offering, tailoring it in the best way. In order to create prototypes, the challenge is to develop the needed technical knowledge to support either the ideation phase either the testing one, creating user-friendly models to be validated in the market. Additionally, in the co-creation phase it will be fundamental to extend the knowledge of the company outside of the actual core-business competencies, developing the flexibility needed to see where value is. To achieve this, alongside leveraging the other companies' knowledge, it will be fundamental to adjust the culture of the company towards a more entrepreneurial paradigm, that will enable the company to quickly scan business opportunities.

Services can be developed not only with the help of customers or partners, but also by leveraging their core business making them be customers and providers at the same time. Therefore, it is vital for real estate companies to bring in the process as many companies as possible, creating attractive and rewarding collaboration experiences.

Collaborations aimed to the co-creation and co-development of services will definitely involve an iterative and engaging prototyping process. Creating and testing the service step-by-step will be a fundamental activity to get to the market with a meaningful offer. Customers will be key partners because they will provide the user-perspective about the value that has to be created and will increase the skills of the designer due to a better knowledge of the problem to be solved. Startups will be the other main partner in this process, due to the completely different and customer-oriented way of working as well as a generally better understanding of the disruptive technologies that will be applied. A key role in enabling these activities will be the creation of open spaces for the co-creation activities. The Physical closeness and the sharing of the activities will create the right innovative environment and will produce a learning outcome far superior.

Additionally, the exploitation of the partnership with tech companies will help in developing the tools and the capabilities to carry out this process with the required confidence, as well as to discover new opportunities related to the digitalization.

5.3.3) Expand the boundaries of knowledge flows

To elicit tacit knowledge is the third step of the process and can also be identified by the most relevant outcome of the previous two. The knowledge flow will create the competencies and the market sense that will allow the servitizing company to establish and succeed in the new market. In the commercial real estate context, the main knowledge inflows that have to be generated will required digital technologies for what concerns the utilization of premises and the observation of the customers, as well as the physical closeness when it comes to learn from them. The main knowledge outflow will be aimed to make the customer aware of the new perspective of servitization and to make them ready for the new ages.

Some of the key challenges at this stage will be to increase the number and the intensity of the interrelation and communication activities, in order to generate the inflows and outflows in an effective way. Additionally, it will be fundamental to make the clusters and the open spaces attractive by making it clear the benefits associated with that. Additionally, the protection of internal IP is another aspect that has to be taken into account, especially when the competitive advantage of a firm is based on easily replicable factors.

To maximize the knowledge flows within collaboration activities, a key aspect is to focus on the creation of project-oriented clusters. It will enable the interested companies to have an incentive to participate while at the same time will generate set of activities based on open spaces, maximizing the closeness benefits. Additionally, big projects of urban developments such as smart cities will involve several different industries and will create big attractiveness talents due to their impact on the society, creating the right condition for the attending company to improve their employer branding. Sharing the activities and working together to the service creation by developing prototypes or by applying design thinking methods will generate a massive amount of knowledge flow, creating learning processes based on the “doing” actions as well as the embeddedness in customers operations. A third perspective in this process will be to leverage the partnerships with academia, by generating technical know-how as well as cross-industry perspectives.

5.3.4) Re-imagine customer experience

The experience design is the central process in the value creation model developed by Chesbrough and constitute the key element to make the value to be perceived by the customer in the most effective way. A fundamental pillar in the service experience in commercial real estate is represented by the focus on people alongside with companies. The goal of real estate companies will be to create a joint value for either the customers either the tenants to produce tangible benefits. A key challenge in this process is to develop an exhaustive and meaningful knowledge about the customers businesses value drivers as well as the main needs of the tenants when it comes to workplace experience. A second challenge will be to change the culture in order to develop a more entrepreneurial and agile mindset. It can provide the companies with the speed and the reactivity to adapt their offer to the changes in the market as well as to the transformations enabled by technological innovations.

A second aspect related to the experience design concerns the creation of standards within the industry. Standards will enable customers to benefit from services at all levels, maximizing their possibility to collaborate and communicate cross-functionally. Additionally, offices are becoming more and more relevant when it comes to attract talents and therefore, the creation of attractive clusters is a top challenge for companies aiming to design an integrated workplace as a service solution.

A key role in the creation of the service experience will be played by the cooperation activities with competitors. Joining forces with other commercial real estate market players will help to build an attractive and large-scale network that will increase the number of customers and tenants available. Additionally, it will contribute to create industrial standards, that will maximize the customer experience by letting the tenants communicate and work under the same conditions.

The customer experience design will see a major role played by startups. Their goal in the process will be to contribute to the re-imagination of the customer experience, designing new paths to market and new user-interfaces that will allow real estate to reach them in a totally innovative way. The involvement of startups may be strengthened by involving them in corporate venture capital initiatives, that will benefit the incumbent due to the closer relation and the option to integrate the newco to their business if it proves to be successful.

A third approach could be to bring clusters beyond the companies and involve the customers. It can be achieved by the organization of crowdsourcing initiatives or by adapting the spaces to be open and to include the customers in the realization of the service platform.

5.3.5) Implement services through workplace expertise

According to the research outcomes, there are three main types of service solutions that will represent the future of commercial real estate: co-working, digital platforms and workplace consulting.

Co-working represent a way to balance the physical space with the intangible solution that may be applied, such as the flexibility of leases as well as the provision of add-on services to personalize the rent. Digital platforms represent a fully digital service experience, with the creation of a digital platform that will transform the tenants in user and the real estate company in either service provider either market maker, creating a tech infrastructure for services to be created. The third approach consist on leveraging the workplace expertise that constitute the core knowledge of the commercial real estate companies and tailor consulting services related to the space optimization or the personalization of transactions.

One of the key challenges at this stage of the process is to build commitment in the whole organization to maximize the service value that it's able to create and to make the offer as closer as possible to the actual needs of the customers. In order to build the right engagement in the company, one of the fundamental steps is to go beyond the traditional silos that characterize the organizational structure of the firms. Bringing together the whole organization and orienting every employee towards the realization of the same set of goals is mandatory to overcome the service paradox and make the new business successful. A second element to be considered when building commitment is making it clear to all the stakeholders that the new model is valuable. The realization of concrete business cases that allow the comparability of results as well as the highlighting of the main obstacles and drawbacks will be a key step to align the either organizational priorities and decisions either the investments that are carried out. Additionally, another big challenge is the continuous integration of customer's feedback even after the services have been created, to keep on developing that workplace expertise that will constitute the key competitive resource to be successful in the market as well as to discover new possibility and allow the service value web to continuously iterate.

One of the most important collaboration approaches at this stage is the inclusion of customers in the more business processes is possible. Activities such as co-creation and prototyping will be important because they will guarantee the amount of in-depth feedbacks that is needed to ensure a continuous improvement and innovation of the service. The provision of shared facilities or the creation of open collaboration spaces is one of the most effective ways to not only increase the engagements and communication with customers in order to receive such feedbacks, but also to extend the touchpoints occasions making it easier to get in touch with potential customers.

A second type of approach is to engage in tight relationships with startups. Activities such as corporate venture capital or incubators will help the company in two ways. On one hand, it will contribute to the culture shift by bringing a completely new mindset close enough to produce a reaction in the real estate incumbent. On the other hand, startups are able to open quick paths to market, which will help the commercial real estate

companies to test new services into the market much faster than in other circumstances, helping them to build the business case and, therefore, to generate early commitment.

Table 3 Open Innovation Impact on the Service Value Web in commercial real estate

<p>I) Data Driven Customer Engagement</p> <p>▶ CHALLENGES:</p> <ul style="list-style-type: none"> • Cultural shift to focus on people • Identify touchpoints opportunities • Development of digital tools <p>▶ ROLE OF OPEN INNOVATION:</p> <ul style="list-style-type: none"> • Networks provide multiple touchpoints • Customer-oriented idea sourcing • Engage startups to leverage technology. 		<p>II) Co-Creation in open spaces</p> <p>▶ CHALLENGES:</p> <ul style="list-style-type: none"> • Digital knowledge in prototyping • Entrepreneurial mindset • Bring companies into the projects <p>▶ ROLE OF OPEN INNOVATION:</p> <ul style="list-style-type: none"> • Prototype with customers and startups • Encourage activity and space sharing • Leverage tech companies' tools 	
<p>III) Multi-source knowledge flow</p> <p>▶ CHALLENGES:</p> <ul style="list-style-type: none"> • Protect the core IP • Increase relations and communications • Create physical closeness <p>▶ ROLE OF OPEN INNOVATION:</p> <ul style="list-style-type: none"> • Encourage clusters development • Prototyping generates learning • Get know-how from Academia 	<p>IV) Re-Imagine Customer Experience</p> <p>▶ CHALLENGES:</p> <ul style="list-style-type: none"> • Discover customers' value drivers • Create standards in the industry • Agile and entrepreneurial mindset <p>▶ ROLE OF OPEN INNOVATION :</p> <ul style="list-style-type: none"> • Collaborate with other CRE players • Collaborate with startups • Bring customers in ecosystems 	<p>V) Workplace Service Provision</p> <p>▶ CHALLENGES:</p> <ul style="list-style-type: none"> • Creation of solid business cases • Overcome siloes to build commitment • Become workplace experts <p>▶ ROLE OF OPEN INNOVATION:</p> <ul style="list-style-type: none"> • CVC to test solutions faster • Frequent customer feedback • Dedicate teams to plan collaborations 	

Source: Produced by the author (2020)

6) Conclusions

This chapter has the goal to provide an answer to the research question and to link it with the problem description in the background. To achieve it, each of the sub-questions have been addressed in order to clarify the reader's perceptions of the building blocks of the main research answer, that is provided afterwards. Additionally, some recommendations have been provided for what concerns the theoretical and managerial implications and the future research prospects.

6.1) Addressing the research questions

The main objective of this research is to understand the role that open innovation and collaboration strategies can play in the servitization of commercial real estate companies. Providing services is identified as one of the key challenges that this sector is facing and will face in the next decade, and therefore there is a strong interest concerning the opportunities that can be exploited by collaboration strategies.

By analyzing scholars' contributions, there are several different ways through which companies can benefit from the relations with external partners either to develop knowledge and expertise, either to discover innovative ways to create value and new markets to be addressed. However, there are some key points that remained uncertain, such as the linkages between the sector-specific challenges and the collaboration approaches and the type of activities that would have produced the best outcomes for servitizing companies.

In order to provide a comprehensive and detailed picture of the role that open innovation can play in re-shaping the future of commercial real estate, the research question has been decomposed, and the process of answering it will start by address each part specifically before summarizing the finding to provide an unique and complete answer.

6.1.1) Benefits and opportunities of services in commercial real estate

The first sub-question has the aim to understand the main reasons that drive the companies in the journey towards servitization and the approach that has been selected to do it is by analyzing the opportunities and benefits that a service-orientation can provide as well as discovering the external driving forces that gave the incentive to transform.

Some of the key benefits that are commonly associated with the closer customer relationship that services are able to create, such as the increase in loyalty and the stronger lock-in effect. It drives also the major cash creation due to the increase and the diversification of revenues, which implies the capability to reach a broader customer base and the exploitation of emerging and disruptive markets. Additionally, services enable a process

of data-driven value creation, that allows the companies to leverage the data they collect to improve their offering and optimize their activity. Additionally, being able to create services that clearly benefit the customers' businesses will constitute a valuable source to increase the commercial real estate companies brand value.

Such benefits are associated with different opportunities that are considered as viable by the research respondents. Commercial real estate companies see services as a way to leverage their workplace knowledge and to monetize with services aimed to optimize the customer experience in the buildings. Additionally, the physical infrastructure that is already provided can be augmented with several software add-ons, such as the creation of marketplaces for companies within the spaces as well as the integration of intangible benefits such as the flexible leases and personalized rents that co-working offers enables, or to completely re-imagine the offering by transforming the physical infrastructure into a digital one, providing platforms or apps to completely change the customer experience and interactions. A final perspective is related to the possibility that sharing economies enable when it comes to material reutilization and wastes reductions.

6.1.2) Main challenges associated with servitization

The second sub-question aims to discover the main barriers and challenges that companies have to face to implement services in their business model. To clarify these elements, the research took into considerations the main obstacles and things to be done for the respondents as well as the main organizational transformation that have to take place to ensure an effective transition towards services.

The challenges that companies have to face can be internal and external. One of the main internal challenge is the cultural change that is required to change the business model. Commercial real estate culture has always been characterized by rigor and a transaction-oriented mindset while, according to the respondents, the needed approach in this new business has to be more entrepreneurial and agile, in order to truly scout the new opportunities, and have to be oriented strongly towards customers. Another big challenge is the knowledge and know-how development. Servitization requires a totally new set of expertise and the development or acquisition of them is seen as a top priority by the managers and stakeholders. Such knowledge is not just about the customers and the market, which are for sure an important part, but has to be related also to the new technologies that will make the transformation possible as well as the new industries and sectors that can play a role or represent a future extension. A third challenge is related to the definition of common industry practices, that will enable the creation of standards and to increase the demand allowing to reach the critical mass to make the business profitable. Finally, a last key internal challenge is to build commitment to the new

business throughout the entire organization, in order to make the transformation effective and to sustain it in the long run.

To address these challenges and to make the company ready for servitization there are several actions that have been prioritized by commercial real estate companies. The customer interactions have increased, to maximize the knowledge gaining and to discover their needs in a more practical perspective. Additionally, companies have understood the need to prioritize the development of workplace expertise. The digital revolution and the business disruptions made it clear that the key source for future competitive advantage will be a superior workplace knowledge. A third step is to truly modernize the organizational structure by creating the executive-level professionals with the responsibility to change the business and with the authority to take risks. Lastly, firms have understood the fundamental needs to bring many companies together in order to increase the knowledge and opportunities at stake as well as to build together a service-oriented ecosystem.

6.1.3) Benefits of open innovation in the servitization process

The third sub-question to be addressed has the aim to clarify the benefits of collaborations and open innovation approaches in creating the conditions for companies to start the transformation and to specifically address the barriers of servitization. According to the empirical findings, there are several benefits that are commonly associated with open innovation that will play a role in enabling the transition.

One of the main benefits that collaborating with external partners is the increased knowledge that flows into the boundaries of the firm. The more various is the network, the more diverse are the ideas and know-how for the servitizing firm and this will definitely increase the possibility to reduce the knowledge-gap and, over time, build a solid new set of capabilities for the firms. A second benefit that is associated with networks and ecosystem is related to their ability to increase the cooperation and coordination between the diverse players and it will be decisive for the creation of industry-standards that will make the services to be wide and profitable enough. Engaging in co-creation activities and putting the specific know-how in common is seen as a great opportunity not only to increase the knowledge, but also to scout new market opportunities that may be developed or at least valued by the companies. That's because open innovation activities provide the flexibility that is needed to create a broad portfolio of opportunities without a strong early-stage financial commitment, allowing the firm to anticipate or to postpone the more binding decisions when there will be more information to make an informed decision.

Being more open and including other companies in the production processes will help the companies to produce the required cultural shift to better approach servitization. Additionally, some types of partners such as customers or startups will play a major role in this process due to the strongly different culture and

orientations. Lastly, the more the partners involved, the more is the risk sharing and it will enable companies to overcome some internal resistance to change due to the less perceived innovation risk.

6.1.4) Open innovation impact in service value creation

This sub-question was meant to discover the ways through which collaboration activities could contribute in the process of value creation in the service design process. The approach to answer this problem was to adapt the service value web developed by Chesbrough (2011) to the specific context and challenges of the commercial real estate industry, highlighting the impact of open innovation activities at each stage.

The empirical results show that open innovation activities can play a decisive role into providing the real estate companies with the tools and the orientation at each stage of the value creation process, helping them to solve some of the critical challenges.

More specifically, networks and ecosystems can help the companies in engaging the more customers is possible, increasing the potential baseline and leveraging the other partners' customer base. Open spaces and co-creation activities are able to increase the touchpoints for companies to meet and see their customers, helping them to engage in a constant test-feedback iteration. Sharing the spaces will create also the physical closeness that is needed to co-create and co-develop the services, re-imagining the design process and maximizing the impact of the startup methodologies and customers interactions. All these activities, as well as the partnerships with technological companies and academia, will increase the knowledge flow within the network, helping the companies to generate and develop the answers to the addressed problems.

Competitors will also play a key role in the process. The creation of industry clusters and the possibility to attract in the co-development process a wide number of customers will constitute a key resource to re-imagine the service customer experience and to make it user-friendly, ensuring a higher level of flexibility and maximizing the cross-functionality through industry standards.

Startups will make the difference for determining the effectiveness of the service offering. Solutions such as co-working or digital platforms needs to be iteratively tested in the market and the slow processes of big companies do not provide a solution to this. For this reason, incorporating startups into the business will provide the companies with the right tools to change the culture and to bring the new solutions to the market faster and better, creating the basics also for a better cooperation with customers.

6.1.5) Role of open innovation in the servitization transformation

According to what has been stated in the previous paragraphs, the researcher has been able to collect enough information to address, structure and, ultimately answer the main research question: “*How can Open Innovation provide strategic advantage in the transition towards servitization for Commercial Real Estate companies in Sweden?*”. After the determination of the main opportunities and benefits of the transformation, and the key challenges associated with it, the approach was to test whether the open innovation and collaboration strategies could provide the tools and the resources to reach such benefits or solve those challenges. The researcher can state that open innovation represents a clear enabler of the servitization of commercial real estate companies for three main reasons.

Open innovation can provide the real estate companies with the tools to solve some of the critical challenges associated with servitization. Engaging in a diverse network can generate the required knowledge flow that allows the companies to overcome their limits and bring the competencies to the service business. Customers, Academia, Technological companies and all the ecosystem of available companies are able to provide, if engaged, the expertise that is needed to transform the commercial real estate industry. Opening the boundaries to external actors, and in particular to customers and startups will create a strong push towards the transformation of the culture to a more agile and entrepreneurial mindset. That’s because it will force the companies to overcome their siloes and to question their operating model, allowing them to learn and adapt from the new actors in the business.

The second key reason is that open innovation and collaboration strategies can bring commercial real estate companies closer to the exploitation of servitization opportunities. The key role in this process is played by the peculiarity of such approaches, that do not require an immediate and strong financial commitment. It will help in bringing down the risks and in creating a broad portfolio of real options that can be carefully evaluated and exploited by the companies. The opportunities can be pursued at the same time and with the same level of commitment, opening the doors of the possibilities that best fit the goals of each company.

The third reason that makes the researcher to consider the role of open innovation as an enabler of the business transformation towards services is its ability to act in the value network and, therefore, to create a valuable service customer experience. External relation will enrich the customer engagement, will provide the tools to co-create with a variety of partners and will maximize the occasions to learn and increase the companies’ knowledge. Such involvement will be the building block of the new customer experience and will play a decisive role in making the service provision fast and effective enough to win the market.

6.2) Theoretical contributions

There are several implications that allow to link this research with the existing literature and enrich it under different perspectives. Even if servitization is a topic that has been widely discussed by scholars, its development in more traditional industries is still at its early stages and therefore there are a lot of new informations and cases that will come in the future years. Additionally, the open innovation perspective is relatively unexplored, and it can open new horizons for the research over the impact of collaboration practices in the transformation of businesses and, more specifically, in the transitions towards product-service-systems.

The first main implication is related to the servitization literature. In particular, this research provides an industry-case of the phenomenon, contributing to the creation of practical frameworks as well as increasing the opportunities and benefits associated with product-service-systems. Commercial real estate is one example of a traditional industry that is undergoing a major transformation due to contextual factors, such as technology, customer changes and sustainability. This research contributes to the specification of the main drivers and objectives that pushes this particular type of companies to transform and deepen the analysis of the key challenges and situation that may prevent it, enabling for future researches over the topic.

The second contribution is related to the enrichment of the open innovation literature, for what concerns the facilitation role that this approach has in shaping business transformations. This research highlighted some of the key contributions that open innovation can provide to companies that are trying to innovate or transform their business model. It produced two main outcomes that contribute to the development of open innovation literature: the increased specification of the operating advantages that sharing the activities and the risks provides to companies and the culture-related benefits that may facilitate the transformation process by creating the internal conditions to do it.

A third implication is related to the expansion of the open innovation literature in services by providing a link between open innovation practices and the value creation process in services. According to Chesbrough (2011), service companies need to focus on a different model to determine their value creation process. This research provides an overview of the open innovation impact on the service value web, identifying the key challenges that companies face at each step and highlighting the main contribution that specific collaboration activities and partners can provide to solve them and, therefore, to create a valuable customer experience. So, this thesis offers a practical representation of the service value web for a non-service company and will represent a starting block to be integrated or confronted with new informations.

6.3) Managerial recommendations

The research shows many perspectives on how commercial real estate companies should move towards servitization. This thesis has been planned in order to provide a meaningful advice for companies to determine the key opportunities of servitization and the best ways to leverage open innovation and collaboration strategies to exploit such perspectives. In particular, there are four key areas where this research is able to provide some recommendations to commercial real estate managers to lead the transformation process.

A first action is to focus on making the organization ready for the transformation, which means to act on the company's culture and building commitment in order to effectively bring everybody in. Company's culture has been identified as one of the main obstacles for the transformation and therefore it's important for companies to actively work on that to turn it into an enabler. To make the company ready means to overcome the traditional mindsets and approaches and to overcome the siloes within the organization. Additionally, it is required to commit the entire organization to the new business by creating new executives and teams with enough responsibility and enough power to take the necessary risks to make the transformation effective.

A second recommendation is to involve customers and partners in a tighter way throughout the entire value creation process. It means to engage in open spaces and co-creation activities, bringing them closer to the decision-making process of the firm. The value creation process for services is strongly different with respect to the manufacturing one and involve a greater variety and intensity of collaboration activities, due to the greater complexity of the business environment as well as the different characteristics of the solution provided. Therefore, engaging in tight collaboration activities and creating the condition for a true sharing of best practices is key for the development of market-winning product-service-systems.

Another recommendation is to carefully plan the collaboration activities to create a valuable ecosystem and to make it attractive for companies to join. It involves a focus on the definition of benefits, with clarity on the reward-contribution dynamics. Creating the conditions to bring more companies into the network is a key challenge and it has to be taken into account when deciding the key aspects of collaborations and the cultural climate that should be promoted in it. The main

Finally, the orientation of the transformation has to be towards customers. They represent the key driver of the transformation and it will be critical to make every adjustment to increase the value provided to them. According to this research customers represent a driver, an objective, a partner and a challenge of the servitization process. Customer-orientation is therefore the key mindset that has to be encouraged and developed at all levels of the transforming organization.

6.4) Suggestions for future research

For what concerns the scope of this research, its results mainly provide an overview of the opportunities and challenges of servitization in commercial real estate and a qualitative perspective on the role that open innovation and collaboration strategies can have in enabling it. There are several new issues and approaches that may extend the scope of this research to provide a more complete framework.

For what concerns the servitization area, a quantitative research may provide the required informations to evaluate the financial implications associated with it, in order to address the profitability and the impact of this transformation both in the short-term and in the long-term. This research has been limited to capture the perspectives of the managers about the key issues and opportunities of servitization and collaboration strategies, while a more quantitative analysis of the phenomenon will extend the framework by adding new elements to evaluate it. The result will be a combination of qualitative perspectives and quantitative projections that will provide the managers with a more detailed and punctual prospect to decide on.

In an open innovation perspective, an extension of this research can look closer to the single collaboration activities to determine the benefits, opportunities and cost of each of them. It means to change the perspective and evaluate the single activities, such as the role of corporate venture capital or the impact of crowdsourcing on the innovativeness of the firms. As a matter of fact, each collaboration initiative presents some peculiarities and should be evaluated carefully to determine the feasibility and the fit with the goals of the company. That's also because of the different types of projects and partners that may be involved, that configure every new specific situation that may presents some peculiar barriers and challenges that needs to be specifically addressed.

If focusing on the commercial real estate perspective, the next step is represented by the development of case studies, that may analyze the impact of services in the organizational structure of the companies as well as on the impact on the cost structure and revenue stream, to measure the extent to which the companies are reacting and the changes in profitability. The need for a case study has been expresses multiple times during the empirical research of this project because of its utility not only to show the best practices to follow, but also to encourage the companies to undertake the transformation. Many incumbents are risk averse and therefore expect to see that a model actually works before investing in it. A specific case study is therefore the natural continuation of this research in order to increase the knowledge of the topic in a practical perspective.

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Appendixes

Appendix 1 – Interview Guides

1- Interview Guide for Commercial Real Estate companies

Servitization Transformation

- What is your opinion on servitization meaning in your business? And which are its main drivers?
- Which opportunities can be created by services in your core business?
- Which opportunities can be created by services out of your core business?
- Which are the main challenges associated with servitization?
- What do you need to react to these changes and effectively servitize? What are you prioritizing?

Open Innovation

- In which ways do you believe collaborations with partners/ecosystems can help transformation?
- Which kind of external collaboration/Open Innovation activities are more suited?
- What are the most relevant partners or ecosystem in these initiatives and how can they help you?
- Which are the main challenges associated with open innovation?
- What have you learned so far and how will the collaboration evolve in the future?

2- Interview Guide for Real Estate Divisions of non-real estate companies

Servitization Transformation

- What is your opinion on servitization meaning in your business? And which are its main drivers?
- Which opportunities can be created by services in your core business?
- Which are the main workplace-related challenges of your internal customer and how can services help in dealing with them?
- Which are the main challenges associated with servitization?
- What do you need to react to these changes and effectively servitize? What are you prioritizing?

Open Innovation

- In which ways do you believe collaborations with partners/ecosystems can help transformation?
- Which kind of external collaboration/Open Innovation activities are more suited?
- What are the most relevant partners or ecosystem in these initiatives and how can they help you?
- Which are the main challenges associated with open innovation?
- What have you learned so far and how will the collaboration evolve in the future?

3- Interview Guide for Real Estate Partners

Servitization Transformation

- What is your opinion on servitization meaning in Real estate? And which are its main drivers?
- Which opportunities can be created by services in real estate industry?
- Which type of service-related projects are you undergoing with real estate companies?
- Which are the main challenges associated with such projects?
- What are commercial real estate companies looking for in projects from companies like yours?

Open Innovation

- In which ways do you believe your and in general collaborations with partners/ecosystems can help real estate companies to transform?
- Which kind of external collaboration/Open Innovation activities are more beneficial for both of the players (your company and real estate company)?
- Which are the main challenges associated with open innovation activities with real estate?
- What have you learned so far and how will the collaboration evolve in the future?

Appendix 2 – Table of coding process

First order Codes	Second Order Codes	Aggregate Themes	Macro Areas
Attract new people to find new revenues	Marketplace Creation	Servitization opportunities	
Provide marketplaces for suppliers to reach tenants			
Exploit the core business services such as maintainance	Exploitation of core services		
Workplace optimization services, security, emissions			
Services beyond the core such as VR meetings...	Digital Platforms and apps		
Create broad information-based services			
Digital application to increase experience			
RE provides infrastructure for companies to benefit	Infrastructure combination		
A "Starbucks" model to combine physical and intangible			
Sharing economies based on modularization and flexibility	Sharing Economy		
More customer's problems can be solved	Stronger customer orientation	Benefits of Servitization	
Increased value provided to customers			
Enlarge the base by taking into account each tenant			
New revenues from the new activities produce new cash	Cash creation and diversification		
Difersification of revenues			
Possibility of price increase due to new value	Data-driven offers		
Better business offer due to new data			
Stronger brand for real estate companies	Stronger brand		
Customers demand flexibility in workplaces	Customer Changes	Main Drivers of Servitization	Perspectives on Servitization
Customers need digital tools to adapt			
customers see offices useful for talent attraction			
customer demand cross-functionality			
Customers see workplaces to attract employees			
Next Gen companies demand flexibility			
Environmental impact forces to develop sustainable solutions	Sustainability		
Tenants and stakeholders demand sustainable benefits			
Technology provides tools to reach customers	Technology		
Technology provides tools to forecast and prvide services			
Technology's data create information and reduce waistes			
AI helps to optimize space use and management			
Technologies helps to slim internal processes			
Technologies provides tools to connect			
5G wil provide more knowledge speed			
Technology provides tools to co-create with customers			
Technology optimizes processes so that resources move	Cultural shift		
Need for the culture to move towards entrepreneurship			
The culture have to enable the focus on people			
Cultural mindset oriented towards people and infrastructure			

Need for a culture that enables speed and agility of reactions		Challenges and barriers of servitization	
Culture is a barrier but can be an enabler			
Need to discover customer's value drivers	Knowledge development		
Development of tech know-how and market expertise is a challenge			
Need to find balance between the two businesses	New Business Commitment		
If things go well there's no agreement on changing			
Commitment is key but has to be shared			
Need for standardization to increase flexibility	Common industry practices		
Bring together many players to enrich the platforms			
Create commonality plus find a position in the cluster			
Educate customers on the value of use	Customer Education	Main Responses and Priorities	
Focus has to be on customer business	Increase Customers Interrelations		
Understand customers by being in their pocket			
Re-imagine customers by focusing on tenants			
Co-working to help customers and startups			
Focus on being partners and not suppliers			
Get data on customer business to anticipate trends			
More interrelation with customers to include them in decisions			
Adopt an infrastructure-mindset to build on it	Develop Workplace Expertise		
Shift from space to marketplace expertise			
Develop knowledge to sell it as consulting			
Focus on the software development over workplaces			
Digital platform to transform space providers into market makers	Bring Partners Together		
Bring companies together to generate standards			
Develop partnerships to increase the knowledge			
Create benchmarking with competitors			
Include new players because diversity means new ideas			
Prototype with customers and startups	Create Commitment		
Align strategy and investments to commit			
Create teams and executives with responsibility			
Collaborations allows to share the risks of innovation	Risk Sharing		
Sharing of activities enables to better manage risks			
Collaborations allows to build critical mass	Standardization		
Partner coordinations helps the creation of standards			
Join forces to standardize and build demand			
Collaboration helps to develop dominant design or technical standards			
Startups helps to approach a more risk-taking approach			
Startups helps to achieve the needed speed to succeed			

New partners create agility in the organizations	Culture change	Key benefits of Open innovation for servitization	Open innovation role in servitization
Ecosystems increase the speed of innovations			
Collaborations forces to open the siloes and change the culture			
Openness means a more diverse approach			
New partners enables to learn more about customers	Increase the Knowledge		
Collaboration makes us to understand the customer's customers			
Development of new technologies that create informations			
Partners provide the tools to servitize			
Networks enable the creation of the needed knowledge			
Activities that increase the informations needed to prioritize customers			
Collaborations make knowledge to go beyond the core			
Partnerships enable the access to specific knowledge	Opportunities generation		
Technological partnerships enable to collect the data on customers			
Collaboration helps to find new opportunities			
Collaboration helps to discover opportunities far from the core business			
Networks represents sources for new business and opportunities			
Openness is the condition to create add-ons services			
Open innovation helps to build a portfolio of opportunities			
Generate innovation activities through openness	Challenges of open innovation approaches		
Networks can provide opportunities for digitalization and smart cities			
Exploration of dirruptive opportunities out of siloes			
Need for clarity in the planning process		Planning Process	
A challenge is to be clear on non-financial benefits			
Need to find the appropriate timing for each activity			
Clarity in the communication of the win-win benefits			
Need for a clear planning of rewards and contributions		IP protection	
Core capabilities IP has to be protected			
Overcome fears by making the cluster attractive and valuable		Organizational Readiness	
Need for organizational adjustments and dedicated teams			
Challenge to build organizational commitment to change			
Ovrcome siloes is a key barrier to collaborations			
Culture has to change to a more creative one	Networks and Ecosystems		
Networks are the best way to create standards			
In networks and ecosystems there can be acquired the needed skills			
Networks can play a role in creating demand			
Ecosystems can open to new opportunities			
Clusters are key to bring companies toghether	Clusters of firms		
Clusters represent the perfect way for big projects development			
Learning and co-development need open-spaces to happen			

Shared facilities can be set to use empty spaces and get feedbacks	Open Spaces	Types of open innovation activities
Physical closeness in shared spaces is the best way to co-develop		
Shared activities and co-development generate learning		
Hackatons and spot events are key to focus on specific topics	Spot Events	
Crowdsourcing is one of the methods to learn from customers	Customer Interrelations	
Customer interrelations have to be increased to get to services		
Customer interactions are vital to co-create		
Co-creation and prototyping is important with all the partners	Co-creation and development	
Co-creation is the best way to build skills in the process		
Prototyping means to adjust in order to create better solutions		
Acquisitions represent a good way to build core capabilities	Direct equity investments	
Corporate venture capital is necessary to build the tools		
Corporate venture capital allows to test ideas and get competencies		
Customers can be service providers and service users	Customers	Partners for servitization
Customers are a key source of co-development		
Startups bring a new mindset and tools to the table	Startups	
Startups have to be involved to benefit from their strenghts		
Startups open new paths to market faster and bring fresh ideas		
Technology companies can provide the tools for the transformation	Tech Companies	
Tech companies enable a new set of possibilities		
Competitors have to be involved in big projects to build trust	Competitors	
Competitors play a key role in making the market aware		
If competitors are involved there will be more incentive to share		
Academia plays a key role in creating cress-sector knowledge	Academia	
An holistic approach is needed, involving market partners and research centers		