Managing co-production in a servitization context: An analysis of the roles of contracting

Kasmaruddin Che Hussin

Department of Management Science

Lancaster University Management School

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This thesis is submitted in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

Declaration

This thesis is my own work and it has not been submitted in support of an application for another higher degree or qualification elsewhere.

Kasmaruddin Che Hussin

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Dedication

To my lovely wife **Nur Ayuni Zuhaimi**, and my four children: **Aiman**, **Aisyah**, **Aidil** and **Amanda**, this is for you.

Thank you for being my source of motivation and support. *I love you*.

Also, to my late dad, **Husain B. Sulaiman**. How I wish you were here today to see this!

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Publications

Parts of this thesis have been published/ presented as follows.

1. Customer-supplier interactions in the servitization context: An analysis using Process Chain Network (PCN) diagrams. **Proceedings of the 25th International EurOMA Conference, 24-26th June 2018, Budapest, Hungary –** with Martin Spring and Kostas Selviaridis

2. Contracting services at different levels of servitization: An empirical analysis of customer-supplier interactions. **Spring Servitization Conference 2018, 14-16th May 2019, Copenhagen Business School, Denmark** – with Martin Spring and Kostas Selviaridis (Note: This paper had been accepted for the conference, but I was unable to attend the conference).

Abstract

The essence of the transition process from a pure manufacturing firm towards servitization is the shift from selling the product alone to selling an integrated product and services package. This process entails significant co-production activities with the customer. To date, little empirical research has been conducted to examine how the servitized manufacturer manages the roles and responsibilities of the customer to enable effective service delivery through contractual perspective. The objectives of this research are twofold: firstly, to understand and explain how contractual governance shape the specifications of customer's roles and responsibilities in service delivery and secondly, to understand the process of co-production with the customer in service delivery after contract stipulation.

As the nature of this research is exploratory, a multiple case study approach was deployed to enable an in-depth investigation of the issues. This study draws on five case studies, representing the three types of servitization (product-oriented services, use oriented services and result-oriented services). The analyses of how the contractual mechanism was used to shape the customer's roles and how the process of co-production activities in service delivery takes place after contract stipulation were based on 35 semi-structured interviews, a review of 493 documents including contracts and 277 email exchanges.

The findings of the study show that contractual governance features mainly in shaping the specifications of customer's roles and responsibilities in service delivery. This research contributes to the literature by providing empirical evidence of the importance of contractual governance in shaping customer roles and responsibilities. Equally important, with the use of the Process Chain Network (PCN) diagram, this study provides insight into how service

delivery in the servitization context is co–produced with the customer after contract stipulation. Therefore, it is argued that identifying the elements of co–production activities that require significant interactions between service provider and customer is crucial when designing effective contract provision.

Keywords: Servitization, service offering, co – production, contract.

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Chapter 1

Introduction

1.1 Research Background

Now that providing services is more lucrative than making products, the old foundations for success in manufacturing are crumbling. Smart manufacturers are creating new business models to capture profits at the customer's end of the value chain.

Wise and Baumgartner (1999, p.133)

With service processes, the customer provides significant inputs into production process.

Sampson and Froehle (2006, p.331)

The quote from Wise and Baumgartner (1999) three decades ago provides the essence of the servitization strategy which urges manufacturers on to go downstream in the value chain by focusing on provision of solutions (i.e. integration of product and services) to customers. The adoption of a servitization strategy does not just mean shifting from selling product alone to selling integrated product and services; instead it is a paradigm shift from a product-oriented mind-set towards a more customer-focused and relational approach (Baines et al., 2007; Davies et al.,2006 ;Oliva and Kallenberg, 2003). This is in line with the definition of servitization by Baines et al., (2007) who highlighted the shifting from selling products alone to selling integrated products and services that deliver value-in-use to the customer.

The quote from Sampson and Froehle (2006) provides a characteristic or definition of service process, focusing on the role of the customer in service production. According to the "Unified Services Theory" (UST), the service production process relies on customer inputs because the customer acts as supplier for the service processes.

The preceding arguments are the fundamental elements of this thesis: first is the notion of servitization, which is the business strategy of providing product and services to the customer, and the second is that of the roles of the customer in providing significant inputs into the service production process. The logical link between these two tenets is that when manufacturers adopt a servitization strategy they have to learn how to work together with the customers, which they might not have to do in pure manufacturing business. The notion of UST provided by Sampson and Froehle (2006) shows that customers have to play their part (i.e. by providing inputs into the service production process) to enable the manufacturers to deliver the services. If customers fail to do their part, this may hinder the manufacturers in delivering the services effectively. It follows that it is of vital importance for manufacturers to know what these customer roles and responsibilities are and how to manage them through a formal contract mechanism. However, despite the important logical link between the core elements of the servitization strategy that requires a more proactive approach to relationship management and the importance of understanding the roles and responsibilities from the customer's perspective in service operation, to date not much research has been carried out on this aspect.

This study aims to fill the gap by empirically investigating how the servitized manufacturer shapes the specifications of the customer's role and responsibilities in the service delivery phase and how service delivery in the servitization context is co-produced with the customer.

This chapter provides a brief overview of the thesis by explicitly focusing on the research motivation, followed by the proposed research objectives and questions.

1.2 Research Motivation

There is a growing interest in both the research community and industry to move towards providing innovative solutions comprising manufactured goods and services to the customer (Baines et al., 2010). This movement has been referred to as the servitization of manufacturing business, a term first introduced by Vandermerwe and Rada (1988). One of the contextual characteristics of the servitization strategy is an increasing level of customer focus, where the integrated product and service offerings change from product-oriented focus towards customer-oriented focus (Bastl et al., 2012). This reflects the paradigm shift from a focus on the manufacturer to ensure the functionality of the product to pursuing the effectiveness and efficiency of the use of the product at the customer consumption level (Oliva and Kallenberg, 2003).

As Wise and Baumgartner (1999, p. 133) suggested that manufacturers needed to "go downstream towards the customer", the extant literature in servitization focused predominantly on researching servitization from the single organisation perspective which was mainly a manufacturer-centred approach (Bastl el al., 2012). This phenomenon of manufacturer-centred approach can be referred to as the pre-servitization journey; where manufacturers faced many uncertainties as they moved from a product-oriented focus towards a service-oriented focus. Most of the studies were concerned with topics such as organizational transformation (Martinez et al., 2010), operations strategy (Baines et., al 2009; Spring and Araujo, 2009; Datta and Roy, 2011), challenges in fostering service culture (Gebauer et al,2005; Manzini and Vezzoli,2003; Baines et al,2009b) and the financial

consequences of adopting servitization (Neely, 2008). Thus, there was an emerging need to shift the research focus from manufacturing-centred approach to an inter-organisational perspective.

Notably, only a handful of studies have dealt with the inter-organisational perspective. These included a study by Martinez et al. (2010) which presented the challenges faced by UK manufacturing companies undergoing the servitization strategy through the insights of a manufacturer and two of its suppliers. Similarly, Bastl et al. (2012) conducted a study using the Cannon and Perreault's framework (Cannon and Perreault, 1999) to investigate the behavioural expectations of a manufacturer and two of the suppliers. The finding of this study showed each of the five relationship connectors in Cannon and Perreault framework are impacted by the adoption of servitization. Karatzas et al., (2017) conducted a study on understanding the role of the manufacturer and supplier relationship and service performance in service triads by collecting empirical data from a manufacturer and three of their suppliers. However, as can be surmised, all the afore mentioned studies (Martinez et al., 2010; Bastl et al., 2012; and Karatzas et al., 2017) were focused on the upstream supply chain (i.e. manufacturer/supplier dyad) but neglected the downstream supply chain (i.e. manufacturer/customer dyad). Moreover, there is still little research that focuses on how the contractual mechanism is used to coordinate and control the two parties in the service delivery phase in the manufacturer/customer dyadic relationship.

Given the dearth of prior research addressing this perspective, I argue that there is a need to conduct empirical research from the perspective of the downstream supply chain, involving the servitized manufacturer and their customer. Customer input is significant in the service process (Sampson and Froehle, 2006), and manufacturers who adopt the servitization

strategy, to a certain extent, are relying on customer input to deliver the services. For instance, in the classic example of servitization by Royce-Rolls, which shifted to servitization by offering its customer power-by-the-hour contracts, the manufacturer charges fixed dollar per flying hours (Fisher et al., 2012a). In this case, the maintenance team of Royce-Rolls were relying on the customer input, among other things, to ensure their airplanes are available on specified time to conduct the maintenance services on the engine. This synchronisation of activities between manufacturer and customer is vital and it needs a formal mechanism of contracts to control and shape the roles and responsibilities of the customer.

It is also evident from the real-life cases regarding the issues of contract failure in delivering the services in the UK that this area needs to be further explored. For instance, it was reported that the UK Government terminated the National Express plc East Coast rail franchise (London-Aberdeen) in 2009 less than two years into a 7.5 year contract because of the failure to meet the contract obligation of making service improvements as stated in the contract (*BBC News,* 2011)

Therefore, there is clear motivation to conduct empirical research on how the contractual mechanisms are used in managing the servitized manufacturer/ customer dyadic specifically in shaping the specifications of the customer's roles and responsibilities in the service delivery phase. Furthermore, it is also important to explore the process of co-production activities between manufacturer and customer in service delivery after stipulating the terms of the contract in order to have a better understanding on how the coordination of activities between the manufacturer and the customer may lead to a successful service delivery.

1.3 Research Objectives and Questions

The literature has widely discussed the fact that one of the main strategies in servitization is to fulfil the needs of the customers (Baines et. al, 2007). Manzini and Vezzoli (2003) argue that the purpose of shifting from designing and selling the physical product only to designing and selling a system of products and services is to fulfil specific client demands. Similarly, Mont (2002) emphasizes that the aims of integrating products and services are to satisfy customer needs. In addition, there is a call from Storbacka (2011) for servitization firms to be more focused on working together with customers and engaging with them in a more inclusive way to deliver the service offering.

However, despite the frequently mentioned importance of customer input in servitization, research regarding how to manage these inputs, particularly in the service delivery phase, is still at the infancy level. More importantly, the extant of the servitization literature has put more emphasis on coordinating the managerial relationship between the supplier and their customers without analysing in depth the contracting perspective. In this respect, most of the previous research have tended to focus on the relational approach (e.g. Kreye et al, 2015; Roehrich and Lewis, 2004), whereas this present study put more emphasis on the contractual perspective.

In the light of this situation, there is a need to conduct empirical research on how servitization firms use the contractual mechanism to shape the specifications of the customer's roles and responsibilities in service delivery, and the co–production activities between manufacturer and customer that take place in delivering the services after contract stipulation.

The objective of this research is therefore to understand and explain how the contractual mechanism is used to shape the specification of customer's roles and responsibilities in service delivery and to further explore the process of how service delivery is co-produced with the customer after the contract has been stipulated. I argue that the best way of exploring this issue is by collecting empirical evidence from the two parties i.e. servitized manufacturers and their customers. Given the objectives of this research, this study aims to address two research questions outlined below.

Research Questions:

R.Q.1: How does the contract shape the specifications of the customer's role and responsibilities in service delivery?

R.Q.2: How is service delivery in a servitization context co-produced with the customer after contract stipulation?

1.4 The structure of the body of the thesis

Following this Introduction, the main body of the thesis is structured as follows.

Chapter 2 presents the review of the literature which was conducted in order to refine and develop the research questions. This is achieved by the review and synthesis of the servitization literature as well as the related literature on customer roles in service process and contracting literature.

Chapter 3 follows to explain the research methodological design applied in this study. This includes discussion and justification of the methodological choices made for this study, the process of collecting the data, analysing the data and discussion of the aspects of research rigour for this study.

Chapter 4 describes the five case studies within three categories of servitization (i.e. product-oriented services, use-oriented services and result-oriented services). Each of the cases are dyadic relationship with the background of the manufacturer and customer, and the contracting process that they went through in delivering the servitized offering.

Chapter 5 presents the analysis of the findings from the case studies. The analysis is described according to the two research questions identified in chapter 2.

Chapter 6 is the discussion chapter where the emerging findings are compared with respect to the extant literature.

Chapter 7 is the concluding chapter and it includes the contributions of the findings to the extant servitization literature, implications for the practice, its limitations and the avenues for future research.

Chapter 2

Literature Review

2.1 Introduction

The aim of this chapter is to outline the development of the research questions through the analysis and synthesis of the literature. The literature review in this chapter consists of three different but interconnected bodies of literature. Section 2.2 discusses the notion of servitization from the servitization stream of literature and reveals the areas where more research is necessary. The research focus is identified and as will be seen the relevant literature reviewed in Section 2.3 and Section 2.4 pertain to customer involvement in service process and contracting.

Section 2.3 provides the discussion and analysis that are drawn from the service management literature with emphasis on customer involvement in the service process. This section will look at the roles of the customer in service operation in general and in relation to the servitization strategy in particular.

Section 2.4 discusses the perspective of contractual relationship drawn from contracting related literature and its role in the servitization setting. The conclusion in Section 2.5 synthesises the reviews from the three bodies of literature discussed to formulate the research objectives and questions for this study.

2.2 Introduction to servitization

This section comprises the main literature review with a discussion and review of the extant servitization literature in order to identify the research gaps for this study. The process started by reviewing the various definitions of servitization. The term 'servitization' has been widely used in several streams in the academic literature as an emerging body of knowledge and Section 2.2.1 discusses the various definitions and meanings of servitization in the literature. This is important as there is an abundance of efforts at definitions, with a plethora of terminologies used to describe a seemingly identical phenomenon of integrating products and services by the manufacturer. This section will focus on the definitions and concepts of servitization that have led to the adoption of those for this study. The review of servitization literature is provided in Section 2.2.2.

2.2.1 Definitions of Servitization

The term 'servitization' was initially introduced by Vandermerwe and Rada (1988). They defined servitization as the movement in which "modern corporations are increasingly offering fuller market packages or bundles of customer-focussed combinations of goods, services, support, self-service and knowledge" (Vandermerwe and Rada, 1988 p.314). Since then, there has been growing interest in servitization research both in the research community and in manufacturers (Baines et. al., 2010). Many definitions were thus introduced into several streams of literature to explain the phenomenon of creating value by adding services to the core product offering (Vandermerwe and Rada, 1988).

Robinson et al. (2002) for example, referred to servitization as a concept "which goes beyond the traditional approach of providing additional services but considers the total offer

to the customer as an integrated bundle consisting of both the goods and the services" (Robinson et al., 2002 p.150). Desmet et. al., (2003) describes this phenomenon as a trend where the manufacturing firms adopt more and more service components into their offerings. Slack et al., (2004) defined servitization as a strategy of the company to become aware of the value of the servitization through their product and sell it to customer. Slack and colleagues drew on an example of this strategy by referring to the ability of Rolls Royce companies producing airplane engines to sell X thousand hours of flying capability. In turn, Ren and Gregory (2007) defined servitization as a change process in which the manufacturing firm embraces service orientation and/or develops more and better services with the aims to fulfil customer needs, achieve competitive advantage and enhance its performance.

In the same vein, Neely (2008) defined servitization as an "… innovation of an organisation's capabilities and process so that it can better create mutual value through a shift from selling product to selling product-service systems" (Neely, 2008, p.107). This is in line with the definition from Baines and colleagues (2009) where they argue that servitization is "… the innovation of an organisation's capabilities and processes to shift from selling products to selling integrated products and services that deliver value-in-use" (Baines, et al., 2009, p.512). In another study, Pawar et al., (2009) considered servitization as "a transition … from an emphasis on the manufacture of products to the provision of service" (Pawar et. al., 2009, p.469).

There is also another stream of the literature that discussed the definition of servitization through the lens of Product Service Systems (PSS). The PSS term originates from Scandinavian countries and it primarily focus on ecological and environmental sustainability (Baines et al., 2009a). As the field developed, the ecological and environmental dimensions

of PSS were treated as a peripheral concept and a focus on economic and business competitiveness emerged.

Goedkoop et al. (1999) define PSS as “a system of products, services, networks of “players” and supporting infrastructure that continuously strives to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models”. In addition, Baines et al. (2007, p. 1543) state PSS as “a special case of servitization” where it refers to market proposition that extends the traditional functionality of a product by adding element of services. Whilst, Mont (2001, p. 34) defines PSS as “A system of products, services, supporting networks and infrastructure that is designed to be: competitive, satisfy customer needs and have a lower environmental impact than traditional business models”.

To conclude, the definitions of servitization in the literature, all were broadly in agreement with the initial definition provided by Vandermerwe and Rada (1988). The central notion to this phenomenon is the movement of manufacturing firms towards service provision. Therefore, I have used Vandermerwe and Rada’s (1988) and Pawar et. al.’s (2009) definitions to define my concept of servitization for this study. To put it concisely, in this study servitization is defined as:

> *The transition process of the manufacturing firm as it shifts from selling product alone to selling integrated product and services.*

2.2.2 Review of servitization literature

As the body of servitization literature has been evolving and growing steadily for the last twenty years, it is worthwhile to unpack this literature in a few related subsections. This is also important for demonstrating how the research problem for this study was arrived at. Section 2.2.2.1 provides the discussion on the motivation behind servitization amongst the manufacturing firms in the extant literature. Section 2.2.2.2 presents the classification of the servitized offerings and explicitly shows the typology adopted in this study. A review of the literature that emphasises the challenges associated with the transitioning from pure manufacturer to servitization follows in Section 2.2.2.3.

2.2.2.1 Motivation to servitize

Interest in the roles of service provision in manufacturing firms has been increasing and continues to grow steadily since the term servitization was coined in the late 1980s (Bustinza et al., 2015). Much has been written to discuss the motives and benefits for manufacturing firms moving towards the servitization (e.g. Wise and Baumgartner, 1999; Eggert et al., 2014; Durugbo, 2014; Fischer et al., 2012, Oliva and Kallenberg, 2003; Baines and Lightfoot, 2013).

The extant servitization literature unanimously suggests that moving towards servitization is for creating value-adding capabilities that are distinctive, sustainable and easier to safeguard from competition from lower cost economies (Baines et al., 2009). Manufacturers in the West were increasingly seeking to increase the percentage of their revenues from service provision (Wise and Baumgartner, 1999).

Specifically, as Wise and Baumgartner (1999) urged pure manufacturers to move downstream into more lucrative product-related services, Oliva and Kallenberg (2003) delineated the motivations to servitize into three broad categories.

- Competitive motivation: By competing through provision of services, which is less visible and more labour dependent it is more difficult for competitors to copy and imitate, thus creating a resilient revenue stream (Heskett et al., 1977, Baines and Lightfoot, 2013). This also sets higher barriers for the competition (Durugbo, 2014).

- Demand-based motivation: As customers demand more services, providing integrated product-service provision enables the needs of the customers to be fulfilled (Ostrom et al., 2010) and customer loyalty to be increased (Gaiardelli et al., 2014; Saccani et al., 2014) besides improving product innovation (Eggert et al., 2011). This is in line with Levitt (1969), who captured the needs of customers for buying services with his memorable declaration: “people don't want to buy a quarter-inch drill. They want a quarter-inch hole”.

- Economic motivation: Wise and Baumgartner (1999) drew attention to the economic motivation for ‘going downstream’ through their article “The new imperative for manufacturing”. They argue that providing services is more lucrative than the old-fashioned manufacturing strategies, which are slowly crumbling. This is in line with other authors who almost unanimously agree that manufacturers moving towards servitization should benefit from the relatively higher and stable revenues and profit margins (see Sawhney et al., 2004; Brax, 2005; Gebauer & Fleisch, 2007).

- Environmental sustainability motivation: In addition, there is also another motivation to servitize from the perspective of the Product Service Systems (PSS) streams of the literature, which is environmental benefits. The authors like Geodkoop et al. 1999; Mont 2002; Tukker 2004 suggested that combining products and services can reduce the environmental impact of consumption. They argued that this can be done through extending the life-cycle of the products, which ideally remain under the responsibility of the providers who in turn service them through life. The demand for materials and energy is reduced which promotes environmental sustainability.

2.2.2.2 Classification of servitized offerings

As mentioned, I view servitization as the transition process of the manufacturing firm as it shifts from selling product alone to selling an integrated product and services package. The transition process will vary from one manufacturing firm to another. Some firms may offer basic service provision to their customer by adding some element of services to their core product such as delivery services or preventive and corrective maintenance. Some firms may offer services that go even further into the customer value chain, which could be up to taking over the responsibility for operating the product on behalf of the customer.

As evidenced in the literature, there are several classifications of service offerings in servitization. Table 2.1 summarises the extant literature on the classification of servitized offerings. The next section will review these classifications of servitized offering and justify the context of empirical work for this study.

Table 2.1: Types of service offerings

Author(s)	Types of service	Description
Boyt and Harvey (1997)	Elementary services	▪ Frequently purchased product-related service which have low complexity and have no need for formalised service provision
	Intermediate services	▪ A set of service components, which require the service provider to be directly involved in supplying the services to the customer. (e.g. repair related services)
	Intricate services	▪ Entail intensive level of services and customer attention which might involve personal delivery and highly complex services (e.g. surveyors or engineer services)
Frambach et al. (1997)	Pre-Sale product services	▪ Aid the buyer in the purchase decision and stimulate adoption of an industrial product (e.g. product demonstration)
	Sale product services	▪ Aid the customer in taking the product into use (e.g. installation and training)
	Post-sale product services	▪ Keep the customer satisfied with the purchase (e.g. regular maintenance inspection)
Gebauer et al. (2008)	Customer services	▪ Facilitate a company's sales at the general level
	Product- related services	▪ Ensure the proper functioning of products
	Customer support	▪ Increase efficiency and effectiveness in the primary or adjacent customer process (e.g. design and construction services)
Gebauer (2008)	After-sales service	▪ Assure the functioning of the supplied product over time
	Product oriented services	▪ Improve the performance of processes that involve the supplied product
	R&D services	▪ Design and implement the production system that integrates the supplied product
	Operational services	▪ Insource and operate some of the customer's processes
Ulaga and Reinartz (2011)	Product lifecycle	▪ Services to facilitate customer access to products and ensure their proper functioning during all stages of the lifecycle
	Asset efficiency	▪ Service to achieve productivity gains from assets invested by customers
	Process support	▪ Services which aim to assist customers in improving their own business processes
	Process delegation	▪ Service to perform processes on behalf of the customers

From the classification of services in table 2.1, it can be seen that they can be synthesised and summarised into three different service categories. First, a service that aims to ensure the product functions as it is supposed to function. This may include installation services, preventive and maintenance services. This is the basic level of services; which manufacturers may offer to their customers. Second are the services that aim at training or facilitating the customers to use the product. Third are services that go beyond - into the customer value chain where the provider acts on the product on behalf of the customer. Ulaga and Reinartz (2011) refer to these services as process delegation services. These classifications echo Tukker's typology of services in servitization as shown in the Figure 2.1. Today the classification proposed by Tukker (2004) is a widely used framework to describe different types of product and service combinations (Pawar et al., 2009). A description of the Tukker (2004) typologies and their application for this study follow.

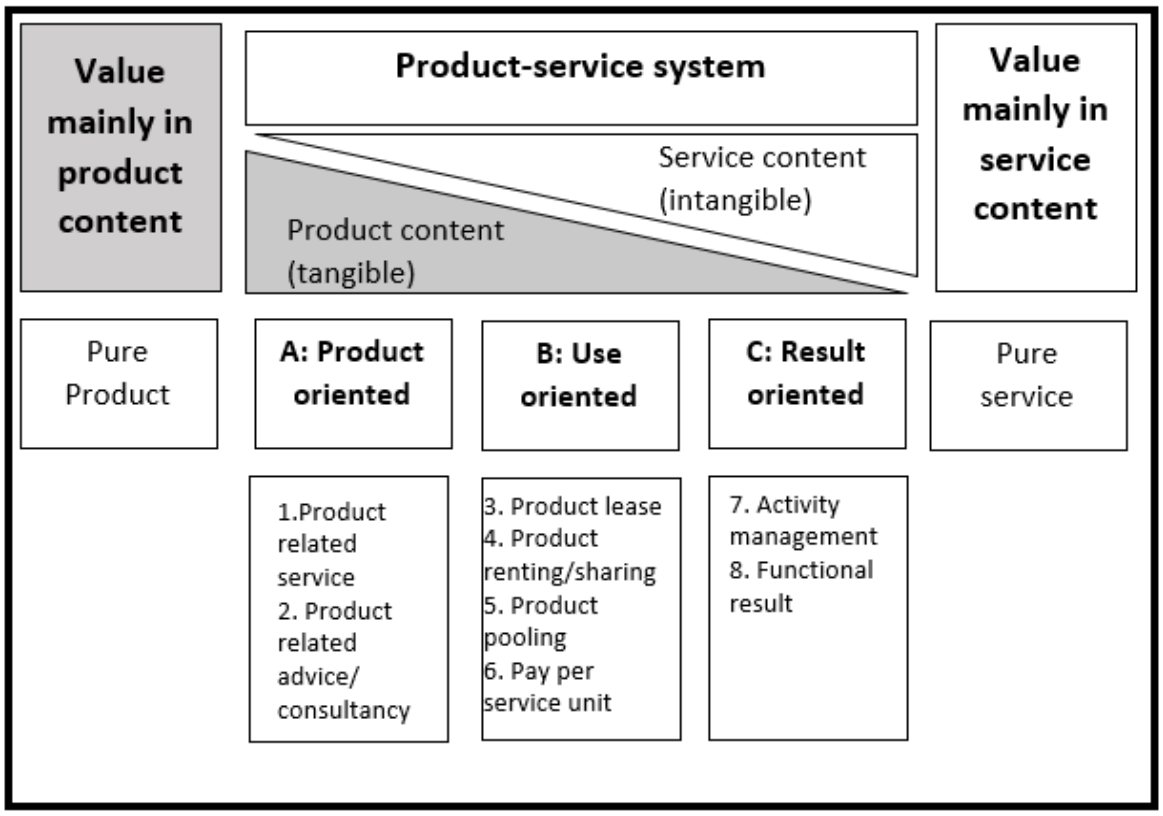

Figure 2.1: The classification of servitized offerings (Tukker, 2004)

2.2.2.2.1 Product oriented

The first category is Product-Oriented Services. The prime focus of the offering in this category is the product, where the core offering is still mainly focused towards sales of the product. Service is offered additionally, at the customer's expense to support a product during the use phase. This can imply, for instance, a regular maintenance contract such as monthly inspections, supply of the consumables and spare parts, as well as take-back agreement when the product reaches its end of life. It may also include advice or consultancy services that are related to the product like demonstration, installation and training in using the product. Under this category, the ownership of the product is transferred to the customer at the moment when the customer pays for the product.

2.2.2.2.2 Use Oriented

The second category is Use-Oriented Services. The focus of the offerings in this category is the use or functionality of the product- service mix. Manufacturers still use their core product as the focus in the business; however, the business model is not geared towards selling the product to the customers. The product stays in the manufacturer's ownership but they sell the use of the product to the customers. The user or customer pays for the use of the product while manufacturers are responsible for the maintenance, repair and control of the product. An example of this category is an availability defence contract, where the availability of the equipment for an agreed amount of time is offered at a fixed price. The supplier is responsible for the whole life cycle of the equipment from design to obsolescence including all maintenance related activities and the customer only pays for the usage of the equipment (Johnson and Mena, 2008).

2.2.2.2.3 Result Oriented

The third category is Result-Oriented Services. In this category, customer and manufacturer in principle agree on specifying the end result to be delivered, and there is no pre-determined product involved. The customer pays for the achievement of the pre-determined result, leaving the manufacturer to decide the most cost-effective means of achieving it. In other words, the manufacturer is paid for the unit of service delivered to the customers. The classical example and widely used in the literature for result-oriented services is "Power-by-the-Hour by Rolls-Royce. In the Rolls-Royce Total Care Offering to their customers, the customer only pays for the hours the engine is used rather than the price of the engine or any after-sales related services.

This study adopts Tukker's typology to conduct the empirical work and will be further explained in the methodology chapter (section 3.5.1: selection of the cases). The focus of the empirical study will be centred on three types of servitization as illustrated by the Tukker typology, where the case studies will be chosen to represent these three types of servitization.

2.2.2.3 Challenges in the transition from pure manufacturer to servitization firm

Despite the fact that transition from pure manufacturing to servitization could bring potential benefits, there are challenges and problems to be faced by the manufacturer during this transition. A study was conducted to explore this so-called 'service paradox' by Gebauer et al., (2005). Gebauer and colleagues conducted a longitudinal study for eight years and found that manufacturing firms that invested heavily in growing their service business and extending service offerings did not get the expected higher rewards. Additionally, Neely

(2008) identified the 'servitization paradox' by adopting a binary distinction between servitized and non-servitized manufacturers in his research. He provided the evidence that servitization firms generated higher sales revenues but were less profitable than the non-servitzed manufacturers.

For this section, I reviewed the servitization literature that highlights some major challenges that are associated with this transition process. In order to categorise these challenges into a broad categorisation, I drew on the thematic analysis work by Zhang and Banerji (2017) who reviewed 48 journal articles that discussed the challenges in servitization. They suggested the five categories of challenges as follows.

- Organisational structure: The transition from pure manufacturing firm to servitization firm is associated with the shifting of a cultural mind-set from product- to service-centric. This is one of the key challenges suggested in the literature (Penttinen and Palmer, 2007; Finne at al., 2013, Oliva and Kallenberg, 2003 and Martinez et al., 2010). Furthemore, Baines et al., (2009) argue that as a manufacturing firm moves towards servitization, employees who might have had a full understanding of the concept and functionality of the product might lack an understanding of the service offerings.
- Business model: Transitioning from pure manufacturing firm into servitization firm entails changes in the business model from transaction- to relationship-based (Oliva and Kallenberg, 2003). It also changes the value proposition from unidirectional value delivery in manufacturing firm towards value co-creation in servitization (Zhang and Banerji, 2017). This will create challenges to the manufacturer which might result in poor design of value proposition that is unable to fulfil customer needs (Pawer et al., 2009; Vandermerwe and Rada, 1988).

- Development process: A generic product development process in a manufacturing firm may not be suitable in the service development process (Zhang and Banerji, 2017). Baines et al (2009) highlighted that reconstructing an innovative development process for servitized offering is paramount for a manufacturing firm to succeed in servitization.
- Risk management: The notion of servitization entails risk, where risk can be defined as the probability of uncertainty in terms of losses, failure or undesirable consequences (Harland et al., 2003). As discussed earlier in this section, Neely (2008) and Gebauer et al., 2005) presented the 'servitization paradox' where uncertainty and risk for manufacturers who had put high investment to build up services offerings often do not achieve the expected increased profit.
- Customer management: In the servitization context, value is delivered to the customer through co-creation activities which entails inter-dependence between the actors (buyer and supplier), instead of the unidirectional value delivery in the manufacturing context (Ng and Nudurupati, 2010). The present study will focus on this challenge.

In order to explore the challenges of customer management in servitization, the next section continues to discuss the notion of customer involvement in the service process in general and in servitization specifically. This is to highlight that servitization related service elements require co-production activities with the customer (Ng and Nudurupati, 2010; Zhang and Banerji ,2017).

2.3: Customer Involvement in service operations

The second part of the literature review reviews the literature that is related to customer involvement in service operations. Section 2.3.1 discusses the definitions of service in the extant literature and explicitly proposes the definition of service element in servitization setting was adopted for this study. Section 2.3.2 provides detailed insight from the Unified Service Theory (UST) of Sampson and Froehle (2006). Section 2.3.3 explains the notion of co-production in the service process, drawing from both the marketing and operation management streams of literature. Section 2.3.4 provides the reviews of the Process Chain Network (PCN) to illustrate the co-production activities between service provider and the customer. Section 2.3.5 and 2.3.6 review the current debates in the servitization literature that focuses on customer involvement and inter – organisational related issues to synthesise the contribution of the current research.

2.3.1 Definitions of service

Generally, there are two ways of considering the definition of service(s). First, as most scholars view "goods" as a tangible output embedded with a value which acts as primary focus of economic exchange (Lusch and Vargo, 2008), services can be characterised as intangible goods or as 'units of an output'. The second way views service as a 'process' of doing something for another party, which can be considered as add-on to enhance the value of the goods without reference to goods and identifies services as the primary focus of the exchange activity (Vargo and Lusch, 2008).

Many definitions of the services in the literature consider services as the unit of output. For instance, from the perspective of marketing literature, the basic features of what

makes a service are referred to as 'IHIP' characteristics (Intangibility, Heterogeneity Inseparability, and Perishability) as explained below.

Intangibility refers to the something which is incapable of being perceived by the senses of humans (Sampson and Froehle, 2006). Harker (1995) described the intangibility characteristics of services as 'something that you cannot drop on your foot'. Heterogeneity refers to multifaceted different experiences that may be had from a single type of service. This is one of the fundamental characteristics of services, which results in variation from one service to another or variation in the same service from day-to-day or from customer-to-customer. This characteristic of service makes it hard for service providers to standardize the quality of their services. Inseparability refers to service that is generally produced and consumed at the same time. Perishability refers to services which are not a stock of fixed assets and it is not possible to store them in inventories (Hill, 1999).

However, many authors in various fields such as in the marketing and operations management (OM) literature have criticized IHIP as a way to define service. From the marketing stream literature, Vargo and Lusch (2004) in their notion of service-dominant logic (S-D Logic), for instance, argue that IHIP characteristics fail to provide a satisfactory basis to define services. In their study, Vargo and Lusch (2004) cited Solomon et al. (1985, p.106) who noted "services marketing refers to the marketing of activities and processes rather than objects" and Lovelock (1991, p.13) stated that services is "process of performance rather than things".

Similarly, in the perspective of operations management (OM) streams of literature, Sampson and Froehle (2006) have provided the most sustained deviation from IHIP characteristics of services through their notion of unified services theory (UST) (Spring and

Araujo, 2009). In their rejection of IHIP characteristics, they argue that the IHIP characteristics can be explained by the customer contact theory (the presence of the customer) (Sampson and Froehle, 2006; Wemmerlov, 1990). The following section will discuss the Unified Service Theory (UST).

2.3.2 Insights from the Unified Service Theory (UST)

The core elements in the Unified Services Theory (UST) are underpinned by this sentence: "with service process, the customer provides significant inputs into the production process" (Sampson and Froehle, 2006, p.331). Sampson and Froehle (2006) argue that the presence of customer inputs in the production process is 'necessary' and 'sufficient' for every service process. They claimed that customer involvement is what distinguishes the production process from manufacturing-based processes where the customer is not required to contribute to the production process at all. Even though customer input may be given at the design stage of the product, it is limited to the point of consumption or the R&D phases. To make this clearer, it is important to unpack the definition of services from the perspective of UST into three components: input, customer and production processes.

2.3.2.1 Input

Customer input in the services process refers to the input that is provided by the customers (Davis and Heineke, 2005). In the production process, it can be in many forms and from various sources including raw materials, human resources, capital and information (Sampson and Froehle, 2006).

Wemmerlov (1990) in his study underlined three general types of customer input particularly in the B2C context, which he referred to as a type of customer contact. First is

customer self-input which refers to the customer who is physically present during the service process. The customer can have a better perception about the service process through eye contact, hearing or touching. Wemmerlov (1990) labelled this input as direct customer contact. One common example for this category of customer input is in the restaurant or hospital industry. The service operator can prepare the materials for service operation such as raw materials for cooking (in the kitchen of the restaurant) or medication stock (for hospitals); however, they cannot perform the actual service process until the customer-self input is present. Hence, in this case, the service provider and customer need to meet and interact with each other during the service operation.

The second type is tangible belongings of the customers which can also act as input into the production process. It can be physical objects that represent the surrogate of the customer-self input presence (Sampson, 2012). Wemmerlov (1990) refers to this as indirect contact between service system and the customers. For instance, in the case when a customer sends their car (tangible belonging) to the garage for repair services where the car is a necessary input for the service operation in the garage. The mechanics can execute the service process without the need for the customer to be physically present.

The third type is when the customer provides information: intangible belongings which can be considered to be an input from the customer to the service operation. Sampson and Froehle (2006) illustrated this with an example of the tax calculation service. The operator from the tax firm requires the customer to send the financial information in order to perform the service process which is calculating the tax amount.

2.3.2.2 Customer

In defining the concept of customer, Sampson and Froehle (2006) make a distinction between the people who make the decision to purchase the product and the people who consume the product in a later stage. Sampson and Froehle (2006) illustrated a situation where a mother who buys cereal for her small child might be referred to as a customer even though the user who consumes the cereal is her child. In the Unified Service Theory, Sampson and Froehle (2006) proposed the definition of customers "as the individuals or entities who determine whether or not the service provider shall be compensated for production" (Sampson, 2001, p.28).

2.3.2.3 Production Process

Building on the unit of analysis of Unified Service Theory which is 'a production process', Sampson and Froehle (2006) refers to the production process as the process of modifying input in the way that can give value to the customer. There are also other processes inside the production process called supporting processes. A supporting process is necessary to accomplish the ongoing production. In explaining this, Sampson and Froehle (2006) give an example of the restaurant, where the cleaning activities or hiring of employees may not be seen to be part of the direct production process but they are necessary to ensure the main production process of cooking and serving the customer run smoothly.

This study adopted the definition of services by Sampson and Froehle (2006) to defines the 'service element' in servitization offerings as: "*with service processes, the customer provides significant inputs into the production process*" (Sampson and Froehle ,2006, p. 331)

2.3.3 The notion of co-production in the service process

Building on the Unified Service Theory (UST) as discussed in the previous section, Sampson (2012) developed visualising the service operation further. He emphasised the roles played by the customers, seeing their participation in the service production as vital. Customers have to interact with the firm in the business process by providing input (whether customer-self input, tangible belongings or information) and/ or participate in the actual execution of the process (Sampson and Froehle, 2006). The underpinning concept that Sampson and Froehle (2006) and Sampson (2012) tried to bring through UST is the notion of co-production activities in delivering the service process. The notion of co-production was gaining wide attention from service marketing scholars (see Lengnick-Hall et al., 2000; Zeithaml et al., 2005 and Vargo and Lusch, 2004). Broadly speaking then co-production refers to the situation where the customers become engaged as an active participant in the service process (Lengnick-Hall et al., 2000; Ziethaml et al., 2005) and the customer interacts with the service provider by providing inputs into the service production process (Meuter and Bitner, 1998; Sampson and Froehle, 2006).

Most of the research on co-production argues for the intensification of cooperation between the customer and service provider to increase productivity and efficiency of the services delivery (Normann and Ramirez, 1994; Kelly et al., 1990). It is also being researched as a tool to satisfy customer needs and create customer loyalty (Auh et al., 2007). The next section discusses the Process Chain Analysis (PCN) as a tool to illustrate the notion of co – production activities in delivering the services.

2.3.4 Process Chain Network analysis

Process-Chain-Network (PCN) is a tool in service visualization technique, introduced by Sampson (2012). The main purpose of this tool is to provide a visual that shows a balanced view of the interaction between customer and service provider from the beginning towards the end of the service delivery process. The development of PCN analysis through mapping the customer and supplier interaction are built on the core foundation of Unified Service Theory (UST) , which highlights the co-production roles of the customer in providing the input into service process (Sampson and Froehle, 2006). PCN analysis considers the service process as a type of resource and process configuration.

Features in the PCN diagram consist of process entities, which refers to the entities (supplier and customer) who participate in the process of service delivery to satisfy their needs. The Figure 2.2 shows the PCN diagram adopted from Sampson (2012). The diagram also shows an arrow sign which connect the activities in the diagram. This arrow indicates the process step where it shows the sequence of performing the service process. Furthermore, each of the process entities (i.e. customer and supplier) has a process domain which includes all the activities that the entity has some degree of control. over

In a process domain, there are three areas which are referred as to as regions. The first one is the direct interaction regions which includes the activities or process steps that requires direct interaction between supplier and customer. The second one is the surrogate interaction region, which it includes the process steps that involve interaction with non-human resources such as information, technology or assets from another entity. The third one is the independent processing region which includes the process steps that do not involve

any interaction with another entity. These three regions are a representation of the three different types of customer contact as proposed by Wemmerlov (1990).

The PCN diagram shows the concept of 'relieving innovation' where the servitized manufacturer performs the tasks that were previously done by the customer in a pure manufacturing setting (Sampson, 2012). This is illustrated in the diagram where the activities that previously took place in the independent region (customer performing the task independently) shifted to the direct interaction region where the manufacturer performs the task interactively with the customer by delivering the solution through a servitized offering. This is also defined as 'super service' by Campbell et al (2011) giving the examples of vendor-managed inventories, where suppliers are responsible for keeping their customers' and distributors' shelves stocked. In the specific context of servitization, Neely (2008) draws an example from the Rolls-Royce company where they shifted from selling engines to leasing engines by the hour of use (power by the hour) and in the process relieving customers of engine maintenance and repair processes.

The review of the extant literature has shown that the application of the PCN is quite limited in the B2B context. The prior studies have focused more on applying PCN in the simple B2C context. For instance, Kazemzadeh et al. (2015) provides an illustration of the service delivery at the hotel stay which illustrates that the hotel has direct contact with its customers at the check-in desk, has only indirect contact with them when the hotel staff take the customer bags to the room, and has no direct contact with customers when the purchasing supplies. In addition, apart from the example of the pizza restaurant, Sampson (2012) has shown examples of PCN applications in health care services and furniture retail services. All these prior studies have not focused on the application of PCN in a more complex B2B context.

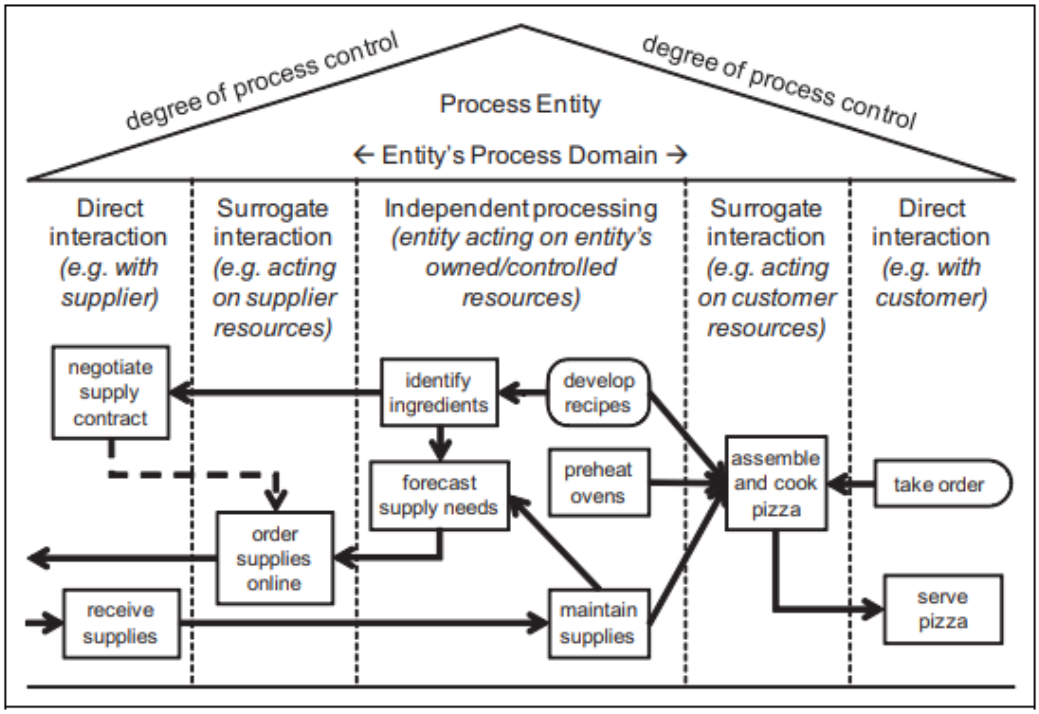

Figure 2.2 : PCN diagram of pizza restaurant (source: Sampson, 2012)

2.3.5 Customer involvement in current servitization literature.

The extant servitization literature acknowledged that successful servitized offerings can only be achieved through fulfilling customer needs (Baines et al., 2009; Galbraith, 2002; Miler et al., 2002; Tuli et al.,2007) as servitization entails a long-term relationship between servitized manufacturers and their customers (Bastl et al., 2012; Tuli et al., 2007; Windahl and Lakemond, 2006). Johnstone et al., (2009) argue that the need for more proactive customer orientation is central to the transition process to servitization.

As discussed in the section 2.2.2.3, one of the challenges for transitioning from pure manufacturing to servitization as identified by Zhang and Banerji (2017) was customer management. This study will focus on and conceptualize this challenge. This part will gradually lead to the gaps in the literature and the research focus.

The conceptual assumption underpinning this challenge (i.e. customer management) faced by a manufacturing firm is the change in the process of creating and delivering the value to the customer. This is because, in the pure manufacturing firm orientation, the process of delivering the value is a unidirectional process (Sampson, 2000): the manufacturing firm produces their product in the factory and passes the finished or semi-finished product to the customer. Figure 2.3 shows the unidirectional flow of the product in manufacturing-based delivery adopted from Sampson (2000).

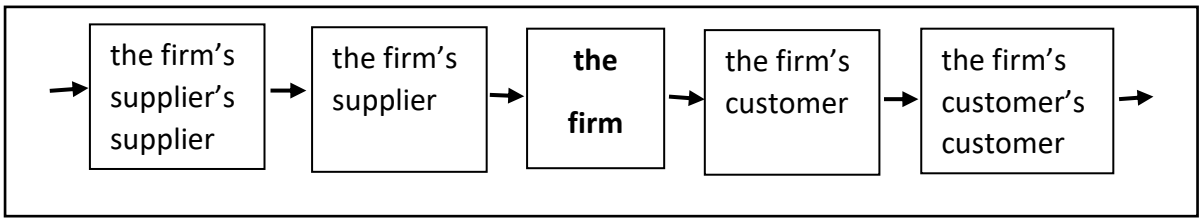

Figure 2.3: Unidirectional manufacturing supply chain (Source : Sampson, 2000)

However, when the manufacturer adopts a servitization strategy the value is delivered to the customer through co-production process with the customer and creates an inter-dependence between the buyer and supplier (Ng and Nurudupati, 2010). Simply put, the manufacturer that offers servitized offerings to the customer cannot deliver the service independently without the customer's participation during the service process. For example, in the case of Royce-Rolls who sells the servitized offering through "Power-by-the-Hour" – availability of flying time instead of selling the engine on its own (Neely, 2008). The Royce-Rolls service team cannot deliver the service maintenance until the customer does their job (e.g. bringing the airplane at the scheduled time). In the case of the customer not doing their job such as not bringing the engine for servicing as scheduled or not using the engine according to the manual provided by the manufacturer, the process of service delivery and availability offered will be affected.

The extant literature has widely discussed the need of the manufacturer to understand the roles of the customer in determining the success of the servitization strategy. For instance, studies from Penttinen and Palmer (2007) and Vandermerwe (2000) highlighted the importance for the manufacturer to understand the evolving needs of the customer. In addition, manufacturers are also required to understand how customers value servitized offerings in order to design and deliver the servitized offering that meets their expectations (Baines et al., 2009; Vandermere, 1990).

The literature has also discussed the roles of the customer during the delivery of the services (Raja et al., 2013; Sheth and Mittal, 2004; Michel et al., 2008; Raddats et al., 2017). In their study, Raja et al., (2013) argued that it is crucial for manufacturers to understand the roles of the customer within the customer's organisation in order to help the manufacturer fulfil the customer's needs accordingly. Furthermore, it emphasizes that it is of fundamental importance for manufacturers to deliver the right message to the right customers in the context of servitization as the customer often plays different roles (Raja et al., 2013). Sheth and Mittal (2004) in their study categorised the roles of the customers in their organisation into three major roles: that of user, payer and buyer. It is further argued that these three distinct customer roles apply to both individual and organisational customers (Sheth and Mittal, 2004).

In their turn, Michel et al., (2008) argued that these three customer roles could be performed by one individual or by three different individuals depending on the organisation and the circumstances. In addition, Raddats et al., (2017) explored the roles of the customer by highlighting the importance of manufacturers and customers cooperating in a more coordinated fashion for delivery of the servitized offerings. They proposed; (i) manufacturers

and customers work collaboratively to create capabilities to enable service offerings, (ii), manufacturers and customers develop capabilities jointly to optimise service performance and (iii) customers manage the risk of service operations by working with manufacturers, combining manufacturers' capabilities with their own.

A review of the literature reveals that customer participation at various stages has been discussed. For instance, the recent study by Ruiz-Alba et. al. (2019), has shed light on customer participation during the stage of designing the service offering. Ruiz-Alba and colleagues studied the moderating role of co-production in the implementation of a servitization strategy in the pharmaceutical industry in a B2B context which showed a significant impact on the firm performance when the customer was involved in the phase of designing the service offering. In their turn, Santamaría et al. (2012) demonstrated that manufacturing firms that engage in collaboration with customers are more likely to achieve successful service innovations. Furthermore, the survey-based work of Schaarschmidt et. al., (2017) found that customer interaction is beneficial to both product and service innovation in a hybrid offering context.

The existing servitization literature, however, appears to be less concerned with customer participation during the delivery phase of servitized offerings, rather mainly focusing on the design stage of the offering. This is despite the fact that the service delivery in a servitization context requires interdependent relationship of co-production between buyer and the supplier (Brax et al., 2017). Furthermore, the delivery of integrated solutions in servitization requires collaboration between customer and service providers, particularly in the installation, training, operations and maintenance activities (Brax and Jonsson, 2009).

Moreover, the relationship between service provider and customer becomes more complex in long-term engagements compared with the one-off system deliveries in pure manufacturing-based provision (Brax and Jonsson, 2009; Smith et al., 2014). Therefore, it Is argued that no matter how good and attractive the design of the service offering offered to the customer is, it will not be of much use if it fails to deliver successfully.

2.3.6 Inter-organisational focus in servitization literature

To date, the current servitization research has largely focused on researching servitization from the perspective of a single organization. The unit of analysis of most of the empirical research on servitization is that of the manufacturers. For example, to name just a few: Baines et al. (2009) and Spring and Araujo (2009) conducted a study to explore the operation strategy of manufacturing firms moving to servitization, Martinez et al. (2010) explored the aspect of organizational transformation, Neely (2010) investigated the financial consequences of adopting servitization amongst manufacturing firms.

Only a handful of research has focused on the inter-firm perspective (e.g. Bastl et al, 2012; Karatzas et al, 2017; Ruiz -Alba et al., 2019; Finne and Holmström, 2013; Johnson and Mena, 2008). Most of these studies focus on the upstream supply chain which is the supplier/manufacturer dyadic relationship. For instance, Bastl and colleagues' focus was on the implication of the servitization strategy on the buyer/supplier relationship. The empirical data were drawn from interviewing the buying firm (servitization firm) and two of their suppliers in aerospace and defence industry. This study was conducted to analyse the behavioural expectations after the adoption of servitization. The finding of this study has showed that both the supplier and the customer are expected to have more information exchange and operational linkages. Similarly, Karatzas et al., (2017) conducted a study on the

triadic relationship through multiple case studies of one servitization firm and three of their service suppliers. In their turn, Finne and Holmström's (2013) study focused on a subsystem supplier in the servitization supply chain and how they designed a solution to enable effective industrial service provision. The importance of understanding and managing the customer in implementing the servitization strategy is mentioned frequently but research on the manufacturer/customer dyad remains scant. Therefore, there is an emerging need to conduct empirical research on the contractual mechanism to control and managing the customer's roles and responsibilities in a servitization context. This study will focus on the contractual perspective as a formal mechanism tool that shapes the customer's roles and responsibilities. The next section discusses the third part of the literature review relating to the contractual perspective in governing inter-organisational relationships.

2.4 Contracting literature

This section covers the third part of the literature review, which review the roles of the contractual mechanism in managing inter-organisational relationship. Section 2.4.1 provides definitions of the contract and contractual relationship. Section 2.4.2 provides insight into the multiple functions of the contract as discussed in the literature. It then followed by Section 2.4.3 which provides the debates in the servitization literature that focus on contractual perspective.

2.4.1 Definitions of contract and contractual relationship

In general, from the perspective of law, a contract is defined as "an agreement which is legally enforceable or legally recognized as creating a duty" (Atiyah, 1989, p.40). The contract agreement usually results in a written document. Even though a written one is not

necessary, not having one will mean that the contract will be difficult to enforce or to be proved to have been witnessed by a third party (Lyons, 1996).

Typically, in a situation when individuals or organisations are involved in buying or selling something, there is a contractual relationship established. It may vary from a simple terms and condition contract that could be printed on a receipt, as with the purchase of an everyday product at a supermarket, or it can be a lengthy negotiated document overseen by lawyers in a complex transaction (Lyons, 1996). In the contractual relationship, formal contracts are a keyway through which organisations govern their relationships with customers, suppliers and business partners (Schepker et al., 2014). It is also used to define the roles and responsibilities of the parties who have agreed to the expected goals and performance (Mayer and Argyres, 2004). The next section expands the reviews on the multiple functions of the contract.

2.4.2 The functions of the contract

One of the most prominent perspectives when reflecting on the function of the contract is transaction cost economics (TCE) (Schepker et al., 2014). This theory specifies the function of the contract as 'safeguarding' which serves as a governance structure in managing the relationship between commercial parties (Mayer and Argyres, 2004). The contract safeguards the commercial parties involved in the transaction by for example the payment mechanism stated in the contract which serves as economic safeguarding to align the objectives of both parties (Datta and Roy, 2013).

Apart from this function of the contract, Schepker and colleagues' work unveils other functions. First the contract can be referred to as a coordination mechanism (Schepker et al., 2014; Mayer and Argyres, 2004). Typically, when the transaction involves a complex project

of high uncertainty, the tools to coordinate the people and resources in an effective and efficient manner must be present (Eckhard and Mellewight, 2005; Dekker, 2004). The contract is used here to ensure coordination through defining the roles and responsibilities of the players (Mayer and Argyres, 2004), ascertaining provisions in the monitoring process (Argyres and Mayer, 2007) and appointing a person-in-charge as a project manager (Ryall and Sampson, 2009).

The contract also viewed as an adaptation mechanism, especially where there is uncertainty in the transaction (Schepker et al, 2014; Leiblein, 2003). In many cases, what has been agreed in the contract may have to change due to unforeseen circumstances (Mayer and Argyres, 2004). The change may be due to volatility in demand or supply or learning-while-doing in uncertain and complex projects (Schepker et al., 2014). Provision for contract adaptation is usually stated as a mutual agreement on the tolerance zone for unforeseen and unexpected events. The common example is price adjustment in long-term contracts, as the price of the material is likely to change and fluctuate (Crocker and Reynolds, 1993).

2.4.3 Contractual focus in the extant servitization literature

As manufacturing firms shift from selling product alone to selling integrated product and services, working interactively with customers to co-create value from service offerings becomes imperative (Bastl et al., 2012; Brax and Jonsson, 2009). Thus, in order to develop an interactive relationship between servitization firms and their customers, contractual capabilities are required to enable firms to work with their customers and suppliers (Kreye et al. 2015; Wang et al., 2011 ; Möller et al., 2005).

Researchers in the servitization field have been studying servitization from both the contractual and relational aspect. For example, the importance of contractual and relational governance in service contracts have been receiving considerable attention among researchers in the servitization literature (e.g. Kreye et al., 2015; Enquist et al., 2011; Ferguson et al., 2005; Roehrich and Lewis, 2014). Kreye et al. (2015) argue that without appropriate contractual and relational capabilities, servitization firms would not be able to co-create the value of servitized offerings effectively with their customers when delivering the services. Kreye and colleagues empirically investigated the impact of service complexity on contractual and relational capabilities of the servitization firm when delivering the servitized offering. Their findings suggested that service complexity did not impact on the development of contractual capabilities in servitization firms.

The study by Enquist et al., (2011) explored the links between contractual governance and performance measurement in a value network for public service. In their turn, Ferguson et al., (2005) showed that relational governance is the main governance mechanism that influences the supplier's performance. In line same vein, a recent study by Zou et al (2019) explores the influences of the contract structure, contracting process and service complexity towards supplier performance. They found that the elements of contract structure, contracting process and service complexity have positive impacts on perceived supplier performance.

The existing literature has demonstrated that the contractual and relational governance play important roles in guiding the process of co-creating the value of servitized offerings and influence the supplier's performance. Notwithstanding, there is not much study done which focuses in-depth on the contractual perspective in governing the co-production

process between the customer and the supplier, particularly in service delivery phase. Thus, the present research aims to fill this gap by exploring how the contract can be used to shape the roles and responsibilities of the customer in service delivery.

2.5 Summary and Synthesis

This part will synthesise the reviewed existing literature and shed light on the knowledge gaps. Section 2.5.1 provides a literature critique to summarise the research gaps from the three bodies of the literature (i.e. servitization, customer involvement in services and contracting) in order to identify the under-studied areas in the servitization literature. Section 2.5.2 builds from the research gaps to formulate the research objectives for this study. The research questions are then formulated from the insights gained from the literature reviews in Section 2.5.3.

2.5.1 Literature critique

Although there is growing interest amongst the academia researching the transition process from a pure manufacturing firm to a servitized manufacturer, most of the research has focused on how the transition affects the operation strategy, business models, financial impact and capabilities. It is argued that the extant literature fails to fully reflect the implementation of this transition, particularly in managing the changes resulting from moving from a 'transactional to a relationship' association with the customer (Oliva and Kallenberg, 2003).

Thus, to summarise the research gap identified in the literature, the majority of research seems to have overlooked the challenges faced in the area of customer management, and specifically how to mitigate these challenges to ensure that the servitized

offering can be delivered successfully interdependently with the customer. This suggests that the extant literature largely considers servitization in a unilateral manner where the manufacturer plays the key role. Despite there being a handful of research looking at the inter-organisation perspective, most of these studies put more focus on studying the upstream supply chain of the manufacturer/supplier relationship, neglecting the downstream aspect of the manufacturer/customer dyadic.

In terms of customer participation in the implementation of the servitization strategy, the extant literature appears not to have paid much attention to the roles of the customer in the service delivery phase. The review of the literature reveals that current research is more focused on customer roles in designing the service offering phase (i.e. customer as co-designer). Given the scarce research, I argue that by adopting the Unified Service Theory (UST) framework, the roles of the customer (i.e. through providing input) and co -production activities particularly in the service delivery phase, can be better understood.

Lastly, the servitization literature seems to have paid little attention to the roles of contracts in managing the manufacturer/customer relationship, particularly in shaping the customer's role and responsibilities in the service delivery phase. Table 2.2 provides a summary of the gaps int the extant literature that this study aims to address and the related studies that been reviewed to build on and expand the existing knowledge.

Research focus	Prior literature reviewed	The aims of this study
Customer roles in the stage of designing the service offerings	Ruiz-Alba et. al. (2019) Santamaria et. al. (2012) Schaarschmidt et. al. (2017)	To address
Customer roles in the stage of delivering the service offerings	Not addressed	To address
Multiple roles of customers within customer's organisation	Sheth and Mittal (2004) Michel et al. (2008) Raddats et. al. (2017)	To address
Capturing the multiples roles of customers within customer's organisation in the contract provision	Not addressed	To address

Table 2.2: The research gaps

These gaps in the existing servitization literature show that there is clear motivation to conduct empirical research on how contracts are used in managing the servitized manufacturer/customer dyad relationship, specifically in shaping the specifications of the customer's roles and responsibilities in the service delivery phase. Furthermore, it is also important to explore the process of co–production activities between manufacturer and customer in service delivery after the contract stipulation.

2.5.2 Research objectives

This study seeks to address the above stated research gaps in the servitization literature. Two research objectives are set to critically examine how contractual roles are used to manage the servitized manufacturer/customer relationship. The objectives of this research are:

1. To understand and explain how the contract shapes the specification of customer's roles and responsibilities in service delivery.
2. To understand the process of co-production activities with the customer in service delivery after the contract stipulation.

2.5.3 Research questions

From the research objectives above, which were arrived at from reviewing the literature, the research questions to be answered in this study are formulated as follows to fulfil each objective:

R.Q.1: How does the contract shape the specifications of the customer's role and responsibilities in service delivery?

R.Q.2: How is service delivery in a servitization context co-produced with the customer after contract stipulation?

Chapter 3

Methodology

3.1 Introduction

This chapter will outline the methodological choices adopted in this research. Section 3.2 discusses the research philosophy, which has been organised and based on the research design framework known as the 'research onion' (Saunders et al. 2015). It will explain the research philosophy elements of ontology, epistemology and methodology. The research approach is discussed in section 3.3 followed by the research strategy in section 3.4 to explain the rationale of using the case study in this study. Section 3.5 focuses on the techniques and procedures used in the process of the case study design, which includes: selection of the case, case study protocol, ethical concerns, data collection process, unit of analysis, source of evidence and data analysis. Lastly, Section 3.6 shows the research rigour for this study.

3.2 Research Philosophy

The selection of the appropriate research design is deemed important as it will guide researchers to justify what types of data are to be collected and how they will be collected (Yin, 2003). It also reflects on how the data is going to be analysed and interpreted (Yin, 2009). Several frameworks have been developed to guide the development and selection of the appropriate research design. For example, Creswell (2009) highlights three broad components of the research design: the philosophical positioning of the research, the strategy of inquiry and the specific methods and procedures to be used. This is in line with Saunders et al. (2015), who developed a research design framework which they labelled as

'research onion'. This research onion is made up of the several layers of philosophy, research approaches, research choices, research strategies, time horizons and techniques and procedures for data collection (see figure 3.1).

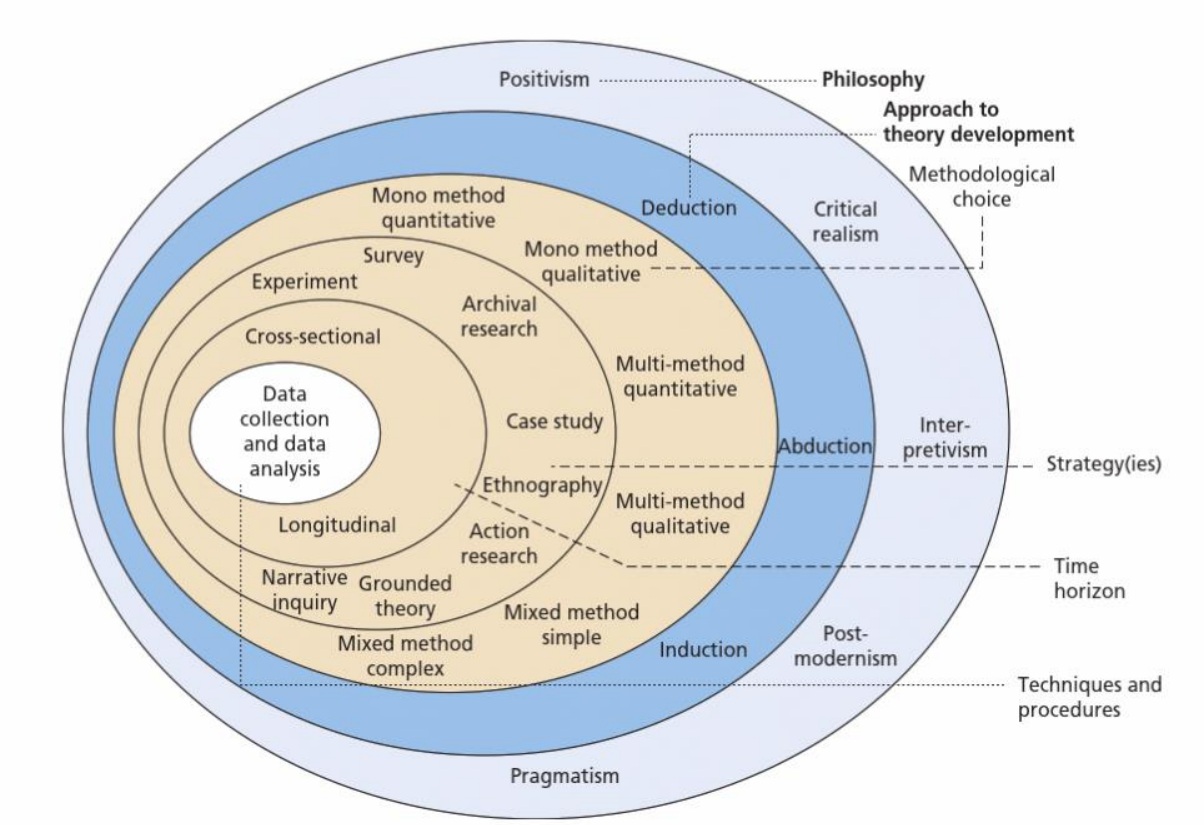

*Figure 3.1: The research 'onion' (*Saunders et al., 2015)

According to Saunders et al., (2015) research philosophy is a comprehensive term that refers to a system of beliefs and assumptions about the development of knowledge. Research philosophy can be divided into different research paradigms which depend on the researchers' beliefs about the creation of knowledge (Johnson and Onwuegbuzie, 2004). Easterby-Smith et al. (2012) suggest that before conducting any management research, it is necessary to have a thorough understanding of the philosophical issues of the research and choose the research paradigm that suits the research best.

The research paradigm is defined as the shared belief systems that influence the types of knowledge researchers seek and how they are going to interpret the empirical evidence that they collect (Morgan, 2007). Guba and Lincoln (1994) suggest that the understanding of the research paradigm applicable to the research is primary and as important as the research methods to be chosen. Guba and Lincoln (1994, p.105) defined the research paradigm as "basic belief systems or world view that guides the investigation, not only in choices of method but in ontologically and epistemologically fundamental ways".

According to Morgan (2007), ontology, epistemology and methodology are linked together. Similarly, Easterby-Smith et al. (2012) argue that both ontological and epistemological assumptions are crucial in guiding social science research and provide an explanation of these three main components: ontology is an assumption about the nature of the world, epistemology is an assumption about the best ways to enquire about the nature of reality. Methodology refers to the set of techniques used in a specific situation to acquire knowledge.

The two mains philosophical paradigms in social science and management research are positivism and social constructivism. The fundamental assumption of positivism is that the social world exists externally, and its properties can be measured to generate the knowledge through objective methods, rather than being inferred subjectively through sensation, reflection or intuition (Easterby-Smith et al., 2012). Furthermore, positivism generally assumes the existence of the social world as objective and views reality as a concrete structure; hence, the nature of reality can only be measured using objective methods (Saunders et al., 2015).

The positivist researcher should strive to generate knowledge of reality in an 'objective' way and be concerned with an 'objective' form of knowledge that specifies the precise nature of laws, regularities, patterns and relationships among the different phenomena measured in terms of social facts (Creswell, 2009). Value-free and theory- neutral observations are considered as pre-conditions for the discovery of truth, and social science should aim to produce law-like generalisations about the social world using quantitative methods such as survey methods (Creswell, 2003). The researcher usually starts with a hypothesis about the nature of the world and then tests the hypotheses generated. They are confirmed in whole or part or are refuted, leading to the further development of theory, which may be then tested by future researchers (Saunders et al., 2015).

Social constructivism on the other hand, builds on the belief that reality is subjective and socially constructed, and views the social world as a projection of human perception (Creswell, 2009). The epistemology that is developed from a constructivism approach will emphasise the importance of understanding the process through which human beings give meaning to their world. Therefore, researchers with this philosophical stance should be part of what is being investigated and gather rich data using qualitative methods such as interviews (Creswell, 2003). The researcher also seeks to provide an explanation to increase the general understanding of the situation.

In the light of the philosophical paradigms above, this research chose social constructivism as the philosophical stance and it has guided the methodological choices for the study. For instance, drawing upon primary data derived from a qualitative method (i.e. interviews) was deemed to be the most appropriate method as the objective was to obtain an in-depth understanding on how servitization firms managed and specify their customer's

role and responsibilities in service delivery through the contractual mechanism. Hence, in tandem with the ontological stance and the nature of the research problem, this has led to the adoption of semi-structured interviews as the main research tool to gather data, with the additional use of documents reviews (i.e. contracts and e-mail exchanges) which will be further explained in section 3.4.

3.3 Research approach

Saunders et al. (2009) refer to research approach as a decision that the researcher has to make in the research design: to use a deductive approach or an inductive approach (Saunder et al., 2009). However, there is also the possibility of combining these two approaches referred to as the abductive approach (Dubois & Gadde, 2002). The aim of this section is to look at these three approaches: deductive, inductive and abductive, and justify the choice of the approach adopted for this study.

3.3.1 Deductive approach

In the deductive approach the researcher starts by developing the theory and hypotheses and then designs a research strategy to test the hypotheses (Saunders et al., 2015). This approach is predominantly used in the natural sciences where laws provide the basis of the explanations allowing for the anticipation of the phenomena and predict their occurrence and permitting them to be controlled (Collis and Hussey., 2003). Robson (2002) presents the five stages of the deductive approach as shown in Figure 3.2.

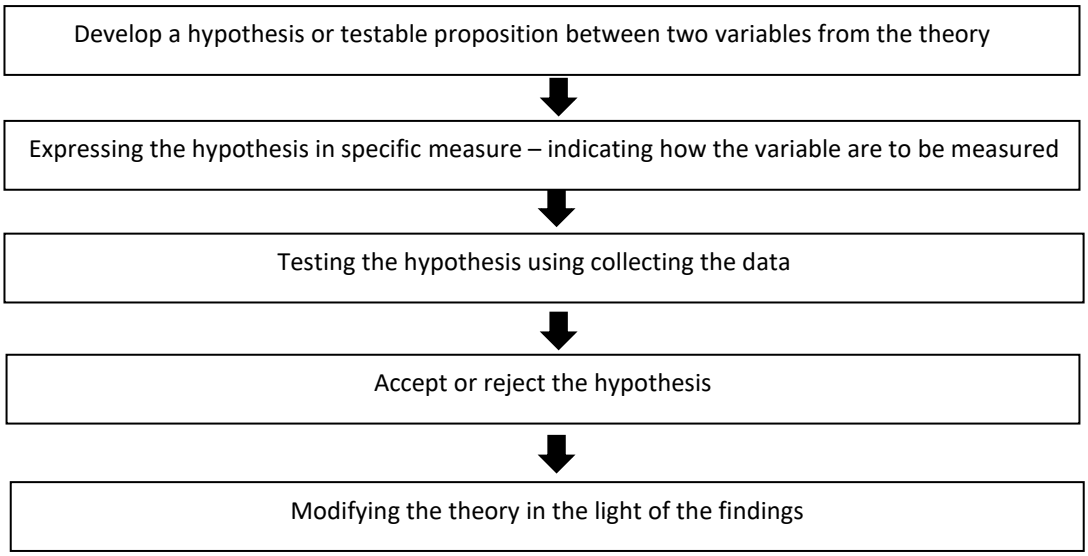

Figure 3.2: Five stages of the deductive approach (Robson, 2002)

Saunders at al., (2015) proposed five important characteristics of the deductive approach. (i) The aims of the research to explain the causal relationship between two or more variables are clearly stated. (ii) The researcher controls the variables in order to allow testing of the hypothesis. (iii) The concepts in the research are operationalised in a way that enables facts to be measured quantitatively. (iv) The researcher is independent from what is being observed. (v) The aims of the study are to statistically generalise to a larger population, and this means that the sample selected must be sufficiently large. As can be seen, the deductive approach lends itself to research from a positivist philosophical stand (Saunders et al., 2015).

3.3.2 Inductive approach

In the inductive approach, the researcher starts with collecting empirical data to develop a theory from an analysis of the data (Saunders et al., 2015). In contrast to the deductive approach, which is more concerned with causal relationships between variables, the inductive approach is more focused on reaching an understanding of the way humans

interpret the social world. In other words, instead of a focus on describing what is happening, the focus is on why something is happening (Saunders et al., 2015).

Researchers who choose an inductive approach are particularly concerned with the specific context of the event where the study takes place (Saunders et al., 2015). Therefore, an inductive approach requires only a small sample of subjects as compared to the large sample numbers of a deductive approach. The researcher is more likely to work with qualitative data in order to establish different views of phenomena being studied (Easterby-Smith et al., 2008).

3.3.3 Abductive approach

An abductive approach combines the stages and characteristics of the inductive and deductive approaches. It suggests a continuous iteration between theory and emerging data being made throughout the data collection and analysis process (Lewis, 1998; Järvensivu and Törnroos, 2010). This approach enables a "fruitful cross-fertilization where new combinations are developed through a mixture of established theoretical models and new concepts derived from the confrontation with reality" (Dubois and Gadde, 2002, p. 559). In practice, instead of starting the research with strong theoretical ideas and hypotheses (deduction) or collecting the data "theory free" (Bryman, 2012) (inductive), the abductive approach uses the concurrent processing of both. This is best described by Green and colleagues as "knowledge of existing literatures therefore shapes the initial research design; but emergent empirical findings cause fresh theoretical perspectives to be mobilized" (Green et al., 2010, p. 117).

3.3.4 Application to this study

The abductive approach was deemed most appropriate for this study since the research empirically investigates a relatively new issue in servitization research. As discussed in the literature review, research on how servitization firms confront their customer management challenges (i.e. in the manufacturer – customer dyadic perspective) remains scant. Hence, using an inductive approach at the start of the research by exploring 'what was going on' in the field, in order to have better understanding the nature of the problem is necessary.

However**,** at the same time, the elements of a deductive approach are also involved and a grasp of the relevant extant literature, particularly on contracting and customer roles in service operation, provides insight from the emerging theory. For instance, the deductive approach has provided some fundamental ideas of how contracts play significant roles in managing the inter – organisational relationship.

Thus, in an abductive research approach, by iterating back and forth between literature review, case evidence and intuition, researchers are better able to understand and develop theories that match reality (Green et al., 2010; Lewis, 1998).

Table 3.1 provides a summary of the themes used in the coding process during data analysis to show the use of a combination of the inductive and abductive approaches in this study. The column for the inductive approach shows the evidence found from the data collection from the field work and the deductive approach column provides the sources of prior literature from which the study has built on and deduced from.

Themes	Inductive approach (Evidence from the field work)	Deductive approach (Sources of prior literature)
Customer roles during designing phases	Data from the interviews	Ruiz-Alba et. al. (2019) Santamaria et. al. (2012) Schaarschmidt et. al. (2017)
Customer roles during delivery phases	Data from the interviews and from reviewing the contract documents	Not addressed in prior literature.
Contract function	Data from reviewing the contact documents	Schepker et. al. (2014) Datta and Roy (2013) Mayer and Argyres (2004)

Table 3.1: Inductive and deductive approach

3.4 Research Strategy: Case Study

Research strategy refers to the action plan a researcher uses to answer the research question(s) (Saunders et al., 2015). This strategy is a methodological link between research philosophy and the subsequent choice of methods to collect and analyse the data in the research (Denzin and Lincoln, 2011). According to the research onion design framework of Saunders et al. (2015), eight types of research strategies can be employed to collect data for the research: experiment, survey, archival research, case study, ethnography, action research, grounded theory and narrative inquiry. Data can be conducted by mono-methods, multiple methods or mixed methods. The choice of the research strategy is guided by five main factors (Saunders et al., 2015). (i) the nature of the research questions and objectives, (ii) the researcher's philosophical underpinnings, (iii) the extent of the existing knowledge in the particular field, (iv) the amount of time and other resources available throughout the study and (v) access to the potential participants and to other sources of data.

Case study research was chosen as the appropriate strategy for this study for several reasons. Firstly, the nature of the research questions and objectives: case studies appear to be suitable for answering the questions of why, what and how with a relatively full understanding of the nature and complexity of the complete phenomenon (Voss et al., 2002; Yin, 2014). The research questions and objectives of this study are to explore how servitization firms manage the interdependent co-production relationship through contractual mechanism. In particular, the study seeks to understand how the element of contractual governance use to shapes the specification of the customer's role and responsibilities in service delivery and how is service delivery in a servitization context co-produced with the customer as stipulated in the contract.

Secondly, the researcher's philosophical underpinning: the case study approach enables an in-depth examination of the actual process, greater understanding of the real-life situation and the complexity of the phenomenon under study (Voss et al., 2002; Yin, 2003). This is in line with a social constructivist approach, which seeks to understand how realities are being experienced. It was also noted that the survey method was inappropriate because of its limitations for providing complete and in-depth knowledge of the phenomenon of the study.

Thirdly, the extent of the existing knowledge in a particular field: case study research offers the strength to lend itself to early, exploratory investigations where the variables are still unknown and the phenomenon not well understood (Voss et al., 2002). This is supported by the review of the extant literature, which reveals that research on mitigating the challenges of customer management through the contractual perspective was still at the infancy stage.

Fourthly, the case study is the preferred method for examining contemporary events where the relevant behaviours cannot be manipulated (Yin, 2014). The two main sources of evidence in case study research are direct observation of the events being studied and interviews with the persons involved in the events. One of the objectives of this study is to investigate how specifications of the customer roles and responsibilities in the service delivery phase manage through the contractual mechanism and the source of data to understand the issue can be obtained by examining the real life situation of the operation and interviewing the persons involved in that particular process.

Furthermore, unlike in experiments where an investigator can manipulate the relevant behaviour by controlling the laboratory setting, case study research does not attempt to do this. As the aims of the study is to have a better understanding of the nature of the process without interfering with the behaviour of the subject being observed, the case study research allows the researcher to look at the phenomenon in its context. The phenomenon in this study is the co -production process in service delivery between manufacturer and customer, where the context is within the servitization firm. This means that this study collects evidence about the phenomenon where it is actually taking place. This is in line with Stake (1995, p. 1), “we enter the scene with a sincere interest in learning how [actors] function in ordinary pursuits and milieus and with a willingness to put aside many presumptions while we learn”. This again contrasts with experiments where the investigator deliberately divorces a phenomenon from its context by selecting a few variables to be tested in controlled laboratory settings (Yin, 2014).

3.5 Techniques and Procedures

This section provides the details of the case study design for this study. Section 3.5.1 describes the selection of the cases, Section 3.5.2 and 3.5.3 explain the case study protocol and ethical concerns of this study. The data collection process is explained in Section 3.5.4 followed by the discussion of the unit of analysis in Section 3.5.5 and sources of evidence in Section 3.5.6. Section 3.5.7 concludes with the data analysis procedure used for this study.

3.5.1 Selection of the Cases

The process of selection of the cases in both quantitative and qualitative research is carried out through a sampling procedure (Paton, 1990). The main distinction of the sampling procedure is whether the participants are selected in a random manner or whether there is an underlying purpose for selecting participants (Bryman, 2012). Usually in quantitative research, the discussion of the sampling procedure involves probability sampling where the researcher aims for statistical generalizability. On the other hand, in qualitative research, the sampling procedure revolves around the notion of purposive sampling where the researcher aims for analytical generalization (i.e. generalising to the theories).

One type of purposive sampling is theoretical sampling which is defined as " the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges" (Glaser and Strauss , 1967, p. 45). Thus, taking into account the research objectives of this study as well as the aims for analytical generalization, the theoretical sampling procedure was adopted for selecting the cases.

Taking into account the principles of theoretical sampling, the cases should be selected based on their theoretical relevance while allowing flexibility to change cases during the research process (Eisenhardt, 1989; Stuart et al., 2002; Dubois and Araujo, 2007). The four main criteria for case selection are as follows. The first criterion is that the firm should only be chosen if it fulfils the definition of a servitization firm i.e. a manufacturing firm that has moved from selling product alone to selling product and services (Vandermerwe and Rada, 1988; Baines et al., 2009).

The second criterion is that the selected servitization firm has to represent three types of servitization as illustrated by the Tukker typology (Tukker, 2004). Thus, companies to be selected must represent either product-oriented servitization, use-oriented servitization or result-oriented servitization.

The third criterion is that the selected firm has to have an on-going or past history of contractual relationship with the customer. This will enable the study to explore the contracting related process between the servitization firms and their customers. The fourth criterion is that the cases must represent a diverse industry, which may vary in terms of the degree of product/service complexity, the length of the contract duration and the value of the project.

This research draws on five case studies. To fulfil the second criterion above, two case studies were representing product-oriented services (POS), one case studies represent use-oriented services (UOS) and two case studies represent result-oriented services (ROS). These five cases draw from four different industries to provide rich data from different degree of service offered and product complexity.

3.5.2 Case study protocol

The case study protocol is an important set of crucial tools and ways to increase the reliability of the case study research and guides the researcher in carrying out the data collection process (Yin, 2009). The term “case study protocol” typically refers to a list of the issues to be addressed or questions to be asked in semi-structured interviews (Bryman, 2016; Yin, 2002). The case study protocol is not merely a list of questions but comprises the following elements: (i) overview of the case study, (ii) field procedures, (iii) case study questions and (iv) a guide for the case study report (Yin, 2009).

i. Overview of the case study

The overview of the case study project usually covers the background of the project and the substantive issues being investigated (Yin, 2009). This information is usually included in the letter of introduction to be sent to the potential interviewees and organisation that are the subjects of the case study. For this study, an introduction letter was sent to potential servitization companies in the UK to be studied. This is the first step taken in negotiating access for conducting the interviews with relevant people in the organisation. The introduction letter provides the background information of the project, what the participant will have to do and includes the benefits that the participant may get for participating in this project. Appendix A shows the introduction letter used in this study with the overview of the case study clearly stated. This letter was sent to potential companies in the first phase of negotiating access. The consent form and personal information sheet (PIS) will be forwarded to those who consent to participate.

ii. Field procedures

Field procedures are practical instructions that guide the researcher before, during and after the interviews. The field procedures include tasks related to securing access to the participants, having sufficient resources during the interviews, creating a data collection schedule and contingency plans for unanticipated events (Yin, 2002). For this study, the field procedures were divided into three categories according to their respective occurrences.

The first set of instructions serves as a list of tasks to do prior to the interview. For instance, the researcher needs to develop a data collection plan, which includes the type of evidence expected to be collected, the roles of the people to be interviewed and any documents expected to be reviewed during the interviews (Yin, 2014). The contact number of the interviewee should be at hand in case a delay occurs during the journey to the interview. This is particularly important in this study, as the researcher had to travel for nearly eighty miles to reach a selected company. In addition, the tasks also include a checklist of items that are required at the interview.

The second set of instructions is related to the issues during the actual interview process. These include reminders to obtain the consent from the interviewee to record the interview, clarifying the length of time the interview will take, and more importantly noting the names of the key individuals mentioned in the interview who might be later identified for further interviews, as part of the snowballing sampling technique.

The third set of instructions relates to the tasks required after the interview. This primarily includes two important reminders. The first is to remind the researcher to contact the participant after the interview to thank him/her for participating in the research. The

second is about reminding the interviewee to send any relevant documents mentioned during the interview if necessary. A summary of the field procedures is shown in Table 3.2.

Table 3.2: Field procedures

Field Procedures	
Time of events	**To do list**
Before the interview	▪ Double check the date and time for the interview ▪ Print directions, contact number of the interviewee and address of the company ▪ Checklist of the items to bring during the interview: personal information sheet, consent form, printed copy of interview questions, notebook, pens and voice recorder.
During the interview	▪ Introduce myself and express the gratitude to the interviewee for their time ▪ Before starting the interview, always ask for the consent of the interviewee to record the interview. Recording the interview will help- to correct the natural limitations of our memories and allows for a thorough examination of the interviewees' answers. ▪ Clarify the duration of the interviews and ask whether the interviewee has time limitations ▪ Ask the interviewee if it is possible to obtain the documents mentioned in the interview ▪ Ask the interviewee for consent if there is need for follow-up enquiries
After the interview	▪ Send an email to thank the interviewee for participating in the interview ▪ Send an email to remind the interviewee to send the documents that have been agreed to be sent by email during the interviews (if needed).

iii. Case study questions

The case study questions represent the heart of the case study protocol and are sometimes referred to as the case study instruments (Yin, 2009). They reflect the actual inquiry of the research and remind the researcher of the kind of information that is to be collected. They enable the researcher to stay on track with the main research inquiry as data collection proceeds. The case study protocol for this study are shown in Appendix C.

iv. Guide for the case study report

Apart from preparing the initial steps before conducting the interviews, there is also a need to plan for the case study report, which should be included in the case study protocol. The report would include the outline and the format, and the targeted audience/reader should be kept in mind. For example, by identifying a targeted audience such as potential journals to publish the work, the case study report will emulate what is an acceptable format and style of the targeted journals. In addition, the case study report is useful as a record of the relevant data reducing the possibility of having to make a return visit to the fieldwork. For this study the plan was to develop a monograph thesis prior to submission to potential journals. Thus, the case study report is focused on outlining the expected information from the case study in answering the research questions and fulfilling a PhD thesis requirement. Nonetheless, it is important to highlight that creating this protocol should not imply rigid adherence to this predesigned format but also allows for some adaptations (Yin, 2014) as the case study plans can change during the process of data collection.

3.5.3 Ethical concerns

Research ethics relate to the conduct of the research, which has to be moral and responsible in relation to the rights of those who become the subjects of the study and/or are affected by it (Saunders et al., 2015). Yin (2009) advises researchers to consider ethical issues that may arise as a result of the nature of the study as well as from the method used to obtain data especially when studying a contemporary phenomenon in a real-life context. Examples of such ethical issues include protecting human subjects from any harm or deception, gaining informed consent from potential respondents, protecting vulnerable groups and protecting privacy and confidentiality of information.

Although this study was considered relatively “low risk” with regard to ethical issues as per Lancaster University assessment of code of practice for ethical research, it is important for any study to abide by some ethical standards (Saunders et al., 2015). This study was guided by the Lancaster University code of practice where the proposal and the participant information sheets were assessed and approved by the Faculty of Arts and Social Sciences and Management School Research Ethics Committee. Appendix B show the consent form, which given to participant before conducting the interview.

3.5.4 Data collection process

Data was collected from three manufacturing firms in the UK, beginning at the end of April 2017. The main strategy used for negotiating access to these companies was through Lancaster University’s existing network with the business organisations in the UK. This network includes the Entrepreneurs in Residences (EiRs) and LEAD programmes under the Department of Entrepreneurship and Strategy, Lancaster University.

LEAD was a leadership development programme designed by Lancaster University for SME companies in the UK. Its aim is to support the important sector of the UK economy with training intervention and it has claimed some great results in improving business performance through enhanced leadership competence and employee engagement. Another way for gaining entry was facilitated through recommendation from the Lancaster University Management School (LUMS) Business Engagement Team. They sent an introductory email to a few companies in relation to my study before I contacted them with my introductory letter. This strategy was very useful in getting access to the local companies in the UK because their existing business relationship with Lancaster University facilitated reaching the right person to negotiate the entry for the data collection process.

3.5.5 Unit of Analysis

In line with the nature of the research problem and the proposed research objectives to be achieved at the end of this study, the primary unit of analysis for this study is the inter-dependent relationship between a servitization firm and its customer. The focus is on the contractual relationship within the servitization firm in delivering the servitized offering. In order to understand the contractual relationship between a servitization firm and their customer the case must be seen as a dyadic setting (i.e. servitization firm – customer).

3.5.6 Sources of evidence

Evidence for the case study research can come from different sources such as: documentation, archival records, interviews, direct observations, participant observations and physical artefacts (Yin, 2014). Each of these six sources of evidence has its strengths and weakness as discussed by Yin (2014). Table 3.3 below has been adapted from his book (Yin, 2014, p. 104) and summarised. It is important to point out that none of the methods is superior to another and they should be used in a complementary manner.

Table 3. 3: Six sources of evidence

Source of Evidence	Strengths	Weaknesses
Documentation	▪ Stable: can be reviewed repeatedly ▪ Unobtrusive: not created as a result of the case study ▪ Specific: contains exact names, references, and details of an event ▪ broad coverage: long span of time, many event and many settings.	▪ Irretrievability: difficult to find ▪ Biased selectivity, if collection is incomplete ▪ reporting bias; reflects (unknown) bias of any given document's author ▪ access: may be deliberately withheld.

Archival records	▪ (same as those for documentation) ▪ Precise and usually quantitative	▪ (same as those for documentation) ▪ inaccessibility: privacy issues
Interviews	▪ Targeted: focuses directly on case study topics ▪ Insightful: provides explanations as well as personal views	▪ Bias due to poorly constructed questions ▪ Responses bias ▪ Inaccuracies due to poor recall ▪ Reflexivity: interview give has interviewer wants to hear
Direct observations	▪ Immediacy: covers actions in real time ▪ Contextual : can cover the case's context	▪ Time consuming ▪ Selectivity: broad coverage difficult without a team of observes ▪ Reflexivity: actions may proceed differently because they are being observed ▪ Cost: hours needed by human observers
Participant observation	▪ (same as above for direct observation) ▪ Insightful into interpersonal behaviour and motives	▪ (same as above for direct observations) ▪ Bias due to participant-observer's manipulation of events
Physical artefacts	▪ Insightful into cultural features ▪ Insightful into technical operations	▪ Selectivity ▪ Availability

For my case study research, interviews were chosen to provide the main source of evidence. This is driven by the adoption of social constructionism as philosophical stance in this research, which aims to understand how a servitization firm manages and shapes the specifications of the customer's role and responsibilities in service delivery through contractual mechanism. Furthermore, interviews were also seen as the most appropriate method for collecting the data as they are capable of providing the necessary data to achieve the exploratory purposes of this study. In particular, interviews allow the researcher to

explore the challenges within the servitization firm in managing customer relationship through contractual perspective. Interviews with managers from different functional departments and with different roles have been useful to uncover several issues and challenges related to the contractual mechanism in specifying customer's role and responsibilities. For example, interviews with the Operation Manager provided important insights on how the contract was being used to control and coordinate the customer's roles.

Nonetheless, interviews are not the only sources of information for this study. As suggested by the scholars, interviews are generally used in combination with other sources to achieve the data triangulation (Bryman, 2012; Miles and Huberman, 1994; Yin, 2002). Thus, the second source of evidence for in this study is documentation. Since the objective of this study is to explore how servitization firms manage their inter-dependent relationship with their customers through the contractual mechanism, reviewing the contract documents was deemed necessary to obtain data for the content of the contracts. In particular, the richness of the data from contract documents was able to provide useful insights on how the roles and responsibilities of customers are shaped through the contractual mechanism. I managed to get copies of the contract documents for all the cases in this study.

In addition, data was also gathered from archival records, in the form of email exchanges between buyers and suppliers. This source of evidence provides rich data because it represents 'real time' data from a retrospective event. At the time I went to the site to collect the data all the events (i.e. the contracting process in shaping customer's roles) had already taken place 5-10 years ago. Any attempt to retrieve this information from interviews has two drawbacks. The person who was in charge and involved in the contracting process may no longer be in that company for whatever reason (retired or left). Even if the people

who were involved in the process could be interviewed, the information they provide may be arguable. The recalled process may be inaccurate, or it might be biased (Leonard-Barton, 1990). Thus, the retrospective accounts of evidence from email exchanges are better for providing rich data regarding the negotiation process of contract design as they enable real-time data in the past to be captured.

A summary of the data collected from interviews and reviewing contract documents, email exchanges and other related documents is presented in table 3.4.

Table 3.4: Summary of the data collected

Case studies	Data source: interviews (Average 1.5 hours per-interview)		Data source: Documents reviewed (493 pages of documents and 277 email- exchanges)		
	From supplier-side (Interviewee position)	From customer- side (Interviewee position)	Contract document	Email exchanges	Other documents
Playground Co – Sea Life Co	▪ Operations Sales and Customer service Manager ▪ Managing Director ▪ Operation Manager ▪ Operations Sales and Customer Service Manager ▪ Contract Manager ▪ Customer Service Executive	▪ access restrictions	▪ JCT contract (25 pages) ▪ Inspection and maintenance contract (30 pages)	▪ access restrictions	▪ Condition of sales (2 pages) ▪ Maintenance report (5 pages)
Playground Co – Community Group	▪ Operations Sales and Customer service Manager ▪ Operation Manager ▪ Operations Sales and Customer Service Manager ▪ Contract Manager ▪ Customer Service Executive	▪ access restrictions	▪ Contract agreement (2 pages) ▪ Condition of sales (2 pages)	▪ access restrictions-	▪

Filtration Co – Citric Acid Co	▪ Managing Director ▪ Operation Manager ▪ Service desk executive ▪ Technical Director ▪ Contract Manager ▪ Service Desk Executive ▪ Technical Director ▪ Contract Manager ▪ Contract Manager	▪ access restrictions	▪ Contract agreement (19 pages)	▪ 145 email exchanges	▪ Product information (10 pages)
Excavation Safety Co – Piling Co	▪ Northern Regional Manager ▪ Operation Manager ▪ Customer Service Manager ▪ Production Executive ▪ Northern Regional Manager ▪ National Key Account & Engineering Manager ▪ Project Manager ▪ Project Manager	▪ access restrictions	▪ Contract agreement (3pages)	▪ 80 email exchanges	▪ Project specification (25 pages) ▪ Payment evident (10 invoices) ▪ Quotation (15 pages) ▪ Technical file (120 pages) ▪ Product brochure (80 pages)
Turbine Co – LU	▪ Energy Manager ▪ Energy Manager ▪ Contract Manager ▪ Energy Manager	▪ Operation Manager ▪ Customer Relation Manager ▪ Marketing and Sales Manager	▪ Contract agreement (2 pages) ▪ General condition (22 pages) ▪ Annexes (10 pages)	▪ 52 email exchanges	▪ Product specification (95 pages) ▪ Availability report (6 pages) ▪ Payment evidence (10 pages) ▪ Maintenance instructions (15 pages)

3.5.7 Data analysis

The data analysis process was conducted in parallel with data collection because of its aims to explore the possibility of emerging themes during the data collection process. It also allows for unexpected research dimensions which might emerge (Voss et al., 2002). As shown in Table 3.3, in total, 35 semi-structured interviews lasting over 50 hours were conducted, complemented by 493 pages of contract and non-contract documents and 277 email exchanges. All interviews were recorded, verbatim transcribed and input into a qualitative data analysis software (NVivo 9.0).

For this research, the qualitative data was analysed using the template analysis strategy (King, 2004) which is a form of thematic analysis. Thematic analysis refers to a method of organizing and analysing textual data into patterns or "themes". To start with, the researcher creates a list of codes (templates) representing themes that have been identified in the textual data. A code refers to a label attached to a section in the textual data to index it as relating to a particular theme that has been identified as important to the research (King, 2004). In the process of coding in this research, the techniques suggested by King (2004) were used as guidelines, together with the abductive process of iterating between the knowledge from the extant literature and the emerging insight from the data.

In this study, for the first step, the initial coding process began with developing codes from the interview protocol. These pre-defined codes were informed by reviewing the extant literature and the conceptual framework of this study.

In the second step, the full set of interview transcripts were analysed systematically and thoroughly to identify the section of the text relevant to the research question. It is then

marked with one or more codes from the initial coding template. During this stage, the emerging data may show inadequacies of the codes created in the initial coding template and King (2004) suggested that the template should be revised a few times before it can be considered 'final'.

3.6 Research rigour

Criteria for evaluating the quality and rigour of qualitative case study research have been put forward by many scholars. One of the most widely used set was proposed by Yin (2014) which included the criteria of (i) internal validity, (ii) external validity/transferability, (iii) reliability and (iv) construct validity (see also; Miles et al., 2014; Lincoln and Guba, 1985; Barratt et al., 2011). In brief, the four criteria can be defined as follows:

i. *Construct validity*: measures the quality of the research design seeking to establish the correctness of operational measures for the study constructs. It also refers to the extent of credibility of the collected data.

ii. *Internal validity*: seeks to establish a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships.

iii. *External validity*: is concerned with the extent to which the research findings can be applied to other situations (Lincoln and Guba, 1985; Miles et al., 2014). In addressing this, researchers provide sufficient details of the research context in order to enable the assessment of its similarity with other contexts and to determine whether the findings can be applied to the other settings (Shenton, 2004).

iv. *Reliability:* seeks to demonstrate that the operations of a study, such as the data collection procedures, can be repeated with the same results.

However, these criteria proposed by Yin (2003) have been argued to be inappropriate for judging the quality of case studies (Scapens, 2004). The criteria of external validity and reliability appear to be strictly using the positivist approach which are unsuitable for case study research. Numagami (1998) had also criticised the inappropriateness and irrelevance of using external validity and reliability as criteria in management research and their unfeasibility in social sciences. This study will therefore use the three alternative criteria proposed by Scapens (2004) to evaluate the quality of this case study research.

To test the trustworthiness of case study research, Scapens (2004) proposed the criteria of procedural reliability, contextual validity and transferability as ways to assess the rigour of the case study.

Procedural reliability is concerned with the appropriate and reliable research method and procedure that are used by the researcher in conducting case study research. The characteristics of a good case study research design should consist of a research design that is able to clearly address the research question, a comprehensive research plan, well documented and recorded evidence and case analysis. The term “audit trail” used in the accounting fields, can track the reliability aspect of the case research by allowing follow-up and examination of what has been done. In this study, procedural reliability was achieved through multiple ways:

- Having an explicit set of case selection criteria (e.g. select the manufacturing companies based on Tukker’s typology of servitization ; POS, UOS, ROS);
- Developing an interview guide/ case study protocol

- Having a list of interviewees with their positions in the companies;
- Recording all the evidence, both from interviews and documentary sources in databases (NVivo software).

Contextual validity is proposed by Scapens (2004) as an alternative to internal validity for measuring the credibility of the case study evidence. This is usually addressed through various techniques such as triangulation of data sources, selection of multiple interviewees from both the buyer and supplier side and incorporation of feedback from participants about the research's interpretation of phenomena. This has been achieved in this research through the following's actions:

- Triangulation of data sources: interview data, email exchanges and organisational documents including contract;
- Multiple interviewees from different functional departments: contract manager from legal department, operation manager from operational department and sales and customer service manager from marketing department;
- Interviewing both buyer and supplier: In practice this was only possible for Turbine Co and LU; however, in the other cases, the buyer's voice was captured through email exchanges and contract documents;
- Retrospective data complemented by contemporaneous data: The data collected from email-exchanges represent useful insight to capture the retrospective side of contract formation and are complemented with interviews data, which offer real-time investigations.

Transferability refers to the extent to which the findings can be applied to other contexts which broadly refers to analytical generalizability issues (Dyer and Wilkins, 1991; Mitchell, 1983). In this sense, the findings from this study are generally transferable to the subset of servitization literature, particularly in the contractual related issue.

Chapter 4

Description of the case studies

4.1 Introduction

This chapter provides a detailed account of the empirical evidence gathered from the five case studies that were carried out during the data collection process, which took place from March 2017 to June 2018; approximately 15 months. As mentioned in Chapter 3, these five cases were initially selected using purposive sampling, to represent the three types of servitization: product-oriented services (POS), use-oriented services (UOS), and result-oriented services (ROS). These five case studies involved four servitization firms: (given the fictional name as Playground Co, Excavation Safety Co, Filtration Co and Turbine Co.) and five customers (hereinafter referred to as Sea Life Co, Community Group, Piling Co, Citric Acid Co and Bay University – hereinafter referred as BU). Table 4.1 shows these case studies in within the categories of servitization.

To differentiate the three different sources/types of data, they are presented in different forms. The interview data are presented in italic text, the contract document data are shown in grey boxes and the email threads were documented in green layout boxes. It is important to note that the interview data and email exchanges are transcribed and quoted verbatim and some of them may contain original language errors. This chapter will serve only to describe the cases and does not provide any detailed analysis.

Section 4.2 provides the description case of Playground Co – Sea Life Co. It have included a brief background of the Playground Co as supplier, services offered by them and background of the customer (Sea Life Co). It is then followed by the contracting process. In

Section 4.3, having the same supplier (Playground Co) the description of the case only explains the brief background of the customer which is Community Group and the contracting process. Section 4.4 provides the description case of the Excavation Safety Co – Pilling Co, then section 4.5 present the case of Filtration Co – Citric Acid Co. Lastly, section 4.6 provides the description of the case of Turbine Co – BU.

Table 4.1: The case studies

Product-oriented services	Case 1	Playground Co – Sea Life Co
	Case 2	Playground Co – Community Group
Use-oriented services	Case 3	Excavation Safety Co – Piling Co
Result-oriented services	Case 4	Filtration Co – Citric Acid Co
	Case 5	Turbine Co – BU

4.2 The Case of Playground Co – Sea Life Co

This section provides the background of the supplier, which is Playground Co, the service that they offered, and the brief background of the customer. It also presents the contracting process between Playground Co and Sea Life Co.

4.2.1 Background of Playground Co

Playground Co is an international business, which manufactures playground equipment. The evidence provided here derives from initial interviews with the Managing Director, Operations Sales and Customer Service personnel, company official website and internal documents such as company brochure and product catalogue.

This company was established in 1978 and has gone through many changes to their business since then having progressed from a cooper, and timber merchant, to an international playground equipment manufacturing company today. The main activities of this company are to design, manufacture and install children's playground equipment worldwide. The company employs 110 people and is based in the North West of England. Playground Co have created and installed over 20,000 play areas in 47 countries across the world.

In terms of market segmentation, Playground Co's customers range from community groups, local authorities, schools and nurseries, leisure operators, architects and developers to last but not least, home and garden. True to the company motto "We pride ourselves on providing an "experience", not just playground, from Initial design through to Aftersales care, we are here to look after you" (Company website), Playground Co offers a wide range of services to their customers starting with free playground design and consultancy services to help the customer choose the right product.

When a customer contacts the Playground Co, the Area Manager arranges a meeting at the site to discuss issues about the project, timescales and budget constraints. The Area Manager advises on the product and makes recommendations for what could work for the customer's play area. A free site survey is then carried out by measuring the potential play area site and recording exact measurements and details. Playground Co also provides delivery and installation services by in-house fully trained Playground Installation teams to ensure that the playground will be installed according to the standard which complies with the requirement of the Health and Safety Act.

4.2.2 The Services Offered by Playground Co

As a servitized playground manufacturer Playground Co has developed a wide range of services to offer to their customer starting from pre-sales services where Playground Co offers free playground consultancy and design to their customers as quoted from their website:

> "*Our playground designers and consultants will help you to rise to the challenge of taking on a new playground and buying equipment. Getting your ideas together and seeing them come alive is an exciting part of the journey. We want to work with you to create the playground of your dreams".*

At this stage, Playground Co offers the services to discuss about the project, timescales and budgets constraint. The Area Manager visits the site and conducts the site survey to get the measurements and details of the project. When the site survey is done, the results are passed to the designer team in Playground Head Office, which then creates a combination of scaled plans, 2D illustrations, picture sheets and 3D walkthroughs to bring the ideas of the project to life.

At the next stage, when the customer has agreed on the quotation and signed the contract, Playground Co offers service of delivery and installation of the playground equipment at the customer site. Playground Co realised that to strengthen the relationship with customers, their services should not end after the completion of the playground installation. Quoted from their website:

> "*Your experience with Playground Co does not stop with the completion of the installation*".

They therefore continue to provide support services after the completion of the installation. These include inspections and maintenance services such as a thorough non-dismantling inspection to the current European safety standard (BS EN 1176). In addition, they also provide a full written report with risk assessment on any noncompliant items and a quotation as appropriate, and all inspections including minor works are carried out onsite. Table 4.2 shows the service offered by Playground Co, from the pre to post- installation phase.

Table 4.2: Services offered by Playground Co

Services offered	Pre -installation	Post - installation
Designing the plan	✓	
Manufacturing the product	✓	
Delivering the product	✓	
Installing the product	✓	
Maintaining the product		✓

4.2.3 Background of Sea Life Co

Sea Life Co is an operator for the 14-acre indoor and outdoor attraction for children and families located in West Midland of England. The park has a display of over 1000 marine creatures in the aquarium. One of the major attractions of Sea Life Co is the “Caribbean Cove - Dorset's Greatest Adventure Playground”, which was designed, built and installed by Playground Co.

This project with Sea Life Co is the biggest project that Playground Co has undertaken to date. The Customer Service Manager of Playground Co recalled:

"With Sea Life Co, it was a very different installation for us…because the size of it… there aren't many clients who have that type of money to spend on a playground".

4.2.4 The Contracting Process

This section focuses on the contracting process between Playground Co and Sea Life Co. The data for this section were gathered from multiple data sources from Playground Co including interviews with personnel including Operational Sales and Customer Service Manager, Contract Manager, Managing Director, Operation Manager and Customer Service Executive, organisational documents and contract agreements. It should be noted that in this case I could not get access to interview the customer due to confidentiality and restriction by the top management of Playground Co in facilitating access to their customer. Nonetheless, I managed to capture the insight from the customer perspective through the documentation and the contract agreement.

4.2.4.1 Sea Life Co Contract

Stage 1: On receipt of Invitation to Tender

The process of contracting between Playground Co and Sea Life Co started when Sea Life Co sent the invitation to tender (ITT) to Playground Co for the large unit of playground equipment for the recreation centre in the West Midlands. On receipt of the ITT from Sea Life Co, Playground Co met with their sales team, which was made up of the designers and area manager, to develop a proposal for the ITT. The interviews had revealed that the first step was to carry out a site visit to the client's play area. According to the Operational Sales and Customer Service Manager of Playground Co, a few competitors had also been invited to send their proposal and bid for the tender. She described the early process as:

"…With Sea Life Co, there was a number of people.... (Competitors) invited to bid. We then had to... (Site visit), so we went. We measure the site, meet with the client, got the brief, we then put together our proposal, so we have a video walk through, 3D plan, quotation… and along with that, we take with us the certificate, the guarantee, all those types of things at that point as well ."

Stage 2: Responding to the ITT meeting

When all the information needed from the site visit such as a measurement of the play area, 3D design plan and a video walk through had been gathered, an attractive proposal was developed which included the plan, design of the outdoor equipment that they offered and the price quotations sent to Sea Life Co.

Stage 3: Presentation

After a period of time (approximately a month), a call from Sea Life Co was received requesting for a presentation and discussion of the proposal. The presentation was delivered by the area sales manager who brought with him some samples to show at the presentation of the proposal to convince Sea Life Co of the quality of the product. The Customer Service Manager of Playground said:

"…our areas sales manager has the sample bag, which includes a lot of these pieces [pointing to the samples of wood, bolt, net] you can see there. So the clients can touch the equipment. See what it's made from... get the quality of it. And that's part of the presentation given to the client."

Stage 4: Negotiation/ Modifying the Proposal

During the first few meetings with the top management of Sea Life Co, aspects of the proposal offered by Playground Co were discussed such as the plan, the size of the playground, and the layout of the playground. The top management of Sea Life Co then asked Playground Co to revise the proposal to suit their needs. According to the Customer Service Manager at Playground Co, that is the usual process that they had to go through with the customers during the early stage of the contracting process. She said:

> *"…So on the back of that, we make couple of changes to the plan which is as the client requested. So we make a few changes according to their needs. So we went back, we showed them what our proposal was, and they asked for a couple of changes, which is common. A lot of our clients do ask for that. We were then changed the plan and the quote. Go back to them again to make sure that is correct…"*

Stage 5: Contract Awarded

After submitting the final proposal to Sea Life Co, Playground Co had to wait for the decision. After about two months, Playground received a favourable reply from Sea Life Co with the information that the tender had been successful and they were awarded the contract for designing and installing the sets of outdoor playgrounds at the Sea Life Co play area.

Stage 6: Drafting the contract agreement

The process of drafting this contract lasted for a month and the formal contract signed with Sea Life Co agreed on 5 years' service maintenance by Playground Co.

Figure 4.1: Set of outdoor playgrounds installed at Sea Life Co.

4.3 The Case of Playground Co – Community Group

Since this case has the same supplier, which is the Playground Co, the background of the supplier and the service offered are the same as presented in previous section 4.2.1 and 4.2.2. Below is the brief background of the customer, which is Community Group and the contracting process.

4.3.1 Background of Community Group

The community group is a group of organisations that work for the public's benefit. It is set up to organise a series of activities at the community level aimed at bringing about desired improvement in the social well-being of individuals, groups and neighbourhoods. For this study, one community group (hereinafter referred as Community Group) in the

Northwest of England was chosen as it had bought a set of playground equipment from Playground Co. This case study represents a small sized project that Playground Co has dealt with.

4.3.2 Community Group Contract

This section describes the contracting process between Playground Co and Community Group. Two main data sources are used here: interviews with Operational Sales and Customer Service Manager and Contract Manager, and reviews of contract documents.

Stage 1: Customer request for a quotation

According to the interviewees, Community Group did not go through a formal process initially. There is no formal Invitation to Tender (ITT) involved and Playground Co was contacted directly by Community Group for a quotation for a small number of outdoor playground equipment that suits their budget.

Stage 2: Develop the proposal/ quotation

As this project was relatively small in terms of quantity of the playground equipment and a tight budget from Community Group, Playground Co conducted the site visit and after a discussion with them came up with a proposal which met their needs.

Stage 3: Customer places an order and signs the contract

The proposal and quotation given by Playground Co was accepted by Community Group and they decided to purchase a set of playground equipment from Playground Co. According to the interviewees, there was less negotiation involved in this case and the customer just filled the order form and signed at the bottom of the order form.

4.4 The Case of Excavation Safety Co – Piling Co

In this section, the background of Excavation Safety Co, as the supplier and their customer, Piling Co are provided. It also includes the service offered by Excavation Safety Co and the contracting process.

4.4.1 Background of Excavation Safety Co

Founded in 1981, Excavation Safety Co is a company that specialises in manufacturing and supplying excavation safety equipment to the construction industry in the UK. The equipment includes a wide range of excavation shoring and safety equipment with ancillary, confined space entry, and pipe stopper products. As an independent business, which operates wholly on an in-house basis, Excavation Safety Co's main operation is to design, develop and manufacture the entire range of shoring equipment in-house. As Excavation Safety Co have vast experience and in-depth product knowledge in the excavation safety industry, their objective is to offer flexibility to meet the unique demands of the customer, having the ability to undertake bespoke products to meet their customer requirements.

Excavation Safety Co started their operation in their depot in Astley, Greater Manchester before expanding across the North West and Midlands. In 2003, the company continued to expand as their hire fleet grew and they opened a new dedicated manufacturing facility depot in Wigan to give better service to all operational depots throughout England.

4.4.2 Background of customer: Piling Co

The customer that was chosen for this case study is one of the leading piling companies in the UK. Piling Co's main operation is to offer design, supply and installation services for all forms of driven piling installation, sheet piling installation, geotechnical services and foundation engineering solutions. In this case study, Piling Co was working on a project of building the Ecostore Rail Unload Building at one of the Power Stations in the UK. Piling Co used the excavation support service from Excavation Safety Co to help them in this project.

4.4.3 The Services Offered by Excavation Safety Co

The services offered by Excavation Safety Co are customisation of solutions to customers in such areas as the production of bespoke excavation safety equipment to the construction industry. They offer two choices to the customer: a renting scheme for their steel equipment, which is an excavation safety solution related product, for the customer's short-term use; and for bespoke equipment, a buyback option, in which the product is bought back at a reduced price.

Another core service that they offer is the installation of the equipment at the customer's site. This is crucial as installation involves heavy and bulky steel, which is classified high risk if not handled by trained and skilled workers. This service also includes delivery to the site and dismantling and return service when the project is over. Table 4.3 shows the services offered by Excavation Safety Co from pre to post installation phase.

Table 4.3: Services offered by Excavation Safety Co

Services offered	Pre - installation	Post - installation
Designing bespoke equipment	✓	
Manufacturing	✓	
Delivering the equipment	✓	
Installing the equipment	✓	
Maintaining and providing support		✓
Dismantling the equipment		✓

4.4.4 The Contracting Process

This section describes the contracting process between the Excavation Safety Co and their customer, Piling Co in relation to the renting of the excavation safety equipment and modular piping for the construction site. It should be noted that in this particular case, it was not possible to collect data from the Piling Co's side. This is due to the fact that the project was over a few years ago. The empirical evidence presented here derived from interviews with the personnel from Excavation Safety Co who were involved in this project, contract documents and other organisational documents related to the project such as minutes of meeting, quotations and email exchanges.

4.4.4.1 Piling Co Contract

The project in this case is that at Drax Power Station where the Principal Contractor was ABC Construction Co and Piling Co was the sub-contractor. Excavation Safety Co had developed a satisfactory relationship with Piling Co in previous years when they supplied the excavation safety solutions to Piling Co. The Drax Power project is interesting because it is considered the biggest project that Excavation Co ever had with Piling Co in terms of the value

of the project and the complexity of the equipment involved in the project. The National Key Account and Engineering Manager of Excavation Co (who was in-charge of this project) said:

> *" Drax Power Station is the biggest project that we had with Piling Co… so what happens is, we have the relationship with Piling Co. Like we've done other work with them before. So we built the relationship from previous work…"*

Stage 1: Develop the proposal by Excavation Safety Co

As Piling Co had built a good business relationship with Excavation Safety Co, they contacted them when they were awarded the contract for piling work on the ABC Construction project at Drax Power Station. At the initial conversation between Piling Co and Excavation Safety Co, they discussed the project specifications and Excavation Safety Co were asked to submit their proposal with the quotation for the project. An email from the Senior Estimator of Piling Co stated:

From: Mr. X

Sent: 10 February 2012; 08:10

To:mrR@excavationsafety.uk

Hello Mr. R

As discussed yesterday we would be interested in appointing Excavation Safety Co to develop our preliminary design for the permanent works sheets piling and propping systems for the new rail off-load building at Drax Power Station. I will forward the relevant information for your review ahead of the meeting.

Regards

Mr. X
Senior Estimator, Piling Co

The process of discussing the specifications of the project and developing the proposal by Excavation Co to meet the needs of Piling Co took about three months. The Project Manager of Excavation Safety Co recalled:

> *"…it took about three months, because it's quite a big excavation, quite deep, some of the loading was up sail loading which is quite high, so it was a bit different… there was a lot of activities going on…we need to ensure that we understand the whole process, the construction and the sequence of the construction process as well."*

When the Excavation Safety Co team had thoroughly understood the requirements of the customer, they began work on the proposal. The completed proposal was then sent to Piling Co after which they had several meetings to discuss the specifications of the project modifying them as it became clearer what was wanted.

Stage 2: Negotiate the proposal

When the Excavation Safety Co presented the proposal to Piling Co, some areas had to be negotiated such as the design and the operational elements of the proposal. In terms of the design of the equipment, Excavation Safety Co found that there were slight differences from the previous specifications provided by Piling Co. In addition, the size of equipment provided by Excavation Safety Co was the biggest piece of equipment involved in the project and they had to take into consideration the other construction work that was running concurrently with the piling work. The Technical Manager of the Project (Excavation Safety Co) recalled:

> *"…when the decision was made that they are going to be using us, the design was changed slightly from what we had look at it initially…our equipment is the biggest*

section, it's about 10 meters, we need to dropping in (as the upper section already done) as we did the lowest section (of the piling project)… a lot of activities going on and we need to ensure that we understood what machine they had on site…"

In addition, in terms of the operational elements of the proposal such as the logistics issue to transporting the equipment from Excavation Safety depot to the project site had also to be negotiated. Since very big equipment was involved, both parties were concerned about the process of loading and unloading the equipment and its installation. In addition, the delivery schedules were discussed as the equipment had to be installed according to the progress of the project. The Technical Manager of Excavation Safety explained:

"We gonna deliver the equipment, so we had…we send them a quote, they give us the order number…because it's a lot of equipment for this job, and then we need to look at their schedule… what happens is each frame will get delivered at separate times…so what we do is…kind of excavate from the top and go down…so you put one equipment in one week. Two week later, have this one (another frame)…."

Stage 3: Sign the contract

When the specifications of the frame and the schedule of the delivery had been agreed upon by both parties it was time for signing of the contract agreement. According to the interview with Excavation Safety Co, they did not enter into a formal process for drafting the contract. Instead Excavation Safety Co used the standard contract documents provided by CPA and it was attached together with the order form. When the customers sign the order form, it is understood that they agree with the terms and condition stipulated in the CPA contract. This contract document is regulated by CPA and it covers all the relevant information of the project such as price, the length of time of hiring and the general terms and conditions.

Figure 4.2 show the process of installing the excavation safety equipment at the power station plant.

Figure 4.2: The process of installing the excavation safety equipment

4.5 The Case of Filtration Co – Citric Acid Co

This section will provide details of the backgrounds of the two companies: Filtration Co, the supplier and their customer, Citric Acid Co. It also includes the service offered by Filtration Co and the contracting process with Citric Acid Co.

4.5.1 Background of Filtration Co

Founded in 1993, Filtration Co is an international company that specialises in the design and manufacture of bespoke solid and liquid separation parts, which constitute filtration process equipment. The evidence provided here derives from initial interviews with the Managing Director of the company, their company official website and internal documents such as company profile and brochures. Filtration Co is a global provider of

bespoke capital plant equipment to the processing industry, be it food, pharmaceuticals, chemical, water or biofuels. The core business of Filtration Co is provision of the rotary drum vacuum filter (RDVF) from the supply of new equipment to the maintenance of existing machinery. The motto of the company is *"Clarity through Engineering"* and Filtration Co offer to their customer bespoke solutions for the customer's specific environment, as it is rare for a customer to be able to accommodate a standard machine in their site.

Basically, Filtration Co designs and manufactures the filtration units to achieve both requirement of filtration performance and fit into the customer's premises. Apart from selling the unit of filtration equipment, Filtration Co also provides a full and complete service for the correct operation and maintenance of a range of filtration equipment including the supply of spares and consumables, process optimisation, operator training, equipment servicing, process troubleshooting and machine overhauls.

4.5.2 Background of customer: Citric Acid Co

The customer that was chosen for this case was a Belgian biotech company, hereinafter referred to as Citric Acid Co. This company is one of the biggest producers of citric acid in Europe producing about 100,000 tonnes of citric acid per year. Founded in 1929 as a joint Belgian and Italian venture Citric Acid Co started with the fermentation of molasses, which was a product of the local sugar refinery. In 1977, Citric Acid Co became a member of the Swiss pharmaceutical group and changed its focus to producing citric acid. The company expanded production to over 112,000 tonnes/year and today, Citric Acid Co has become one of the largest and most efficient citric acid producers in the world (company website).

4.5.3 The Services Offered by Filtration Co

Filtration Co offer two stages of service to their customers. In the pre-sales stage, a problem-solving service is offered in the form of customization of the filtration equipment according to the unique needs of the customer. The Technical Director of Filtration Co explained this as:

> *"Every single unit of our filtration equipment is bespoke…because they are so different and diverse…it is tailored to the unique need of our diverse customers"*

In the post-sales stage Filtration Co offer a service maintenance contract to their customer in which they provide routine inspection for the filtration equipment supplied. This includes maintenance work such as lubricant changes, replacement of wear plate and filter media of the filtration units. In addition, Filtration Co also offer process consultancy and training to help customers improve and optimise filter performance. Table 4.4 shows the service offered by Filtration Co from pre to post – installation phase.

Table 4.4: Services offered by Filtration Co

Services offered	Pre - installation	Post - installation
Building the proto-type	✓	
Manufacturing bespoke product	✓	
Delivering the product	✓	
Installing the product	✓	
Training and consulting		✓
Maintaining the product		✓

4.5.4 The Contracting Process

This section describes the contracting process between Filtration Co and their customer, Citric Acid Co. The information provided in this section was gathered from multiple data sources including interviews with the manufacturer, email exchanges and contract documents. I did not have an opportunity to interview the customer due to restricted access. Nonetheless, insights from the customer perspective were obtained through an archive of email exchanges and other related documents such as minutes of meetings and contract documents.

4.5.4.1 The Citric Acid Co Contract

The process of contracting in this case is different from that of Playground Co. This is because the nature of the product and service offerings are different. Filtration Co offers a bespoke filtration machine, which is a unique product, tailored to the needs of their customer. In this particular case with Citric Acid Co, the process began when Citric Acid Co contacted Filtration Co to build three units of the filtration machine for filtering citric acid. Responding to that inquiry, Filtration Co requested Citric Acid Co to send a sample of the citric acid that was to be filtered. This is an important step at the beginning of the process because Filtration Co has to carefully examine and run tests on the sample to discover the attribute of the sample, how it can be filtered and the types of filter that would have to be used in the process. Technical director of Filtration Co explained this initial process:

> *"First of all, we got an inquiry from the customer, and the customer was sending the sample of the materials that needed to be filtered. They send us a sample because they*

don't know whether this material can be filtered; we don't know whether it will filter, because every application is different".

In the next stage, Filtration Co run tests on the sample in a small filter machine and collect the relevant results such as how much of it can be separated into liquid and solid and the time needed for filtering. Filtration Co then send the filtered sample with the results to the customer for comments and feedback. Technical Director of Filtration Co stated this as:

"…if that works (the testing process of filtering), and looks good, what we do then, we collect the sample and we send it back to the client. Because we don't know whether it meets their needs, so we send the pieces back to them...so we send back piece of filter cake and the sample of the filtered liquid that was filtrated… if they are happy with it, then we can take it to the next stage..."

When the customer is satisfied with the results of the test, Filtration Co begin the process of building the proto-type machine, which will be used in a trial process in the production line. Technical Director of Filtration Co said:

"*…next stage will be normally to prove it as a continuous process. So then we used something like this, which is large-scale unit, the little version of that (large size of filtration units), and then we can actually now process several buckets of materials through that. Client might want to do that just to verify."*

Sometimes, the customers would like to skip this trial process to speed up the production process. He explained:

"They might skip this stage, and they might want to go straight to process trials, at which point they won't use that (small filtration unit), go straight to one of those (large

size of filtration units). And then that will be sent to the client, to his process, it will be connected up, and then we will run their product straight through the filter as a live production.

When the trial filtration machine is ready it is sent to the customer who is asked to run the test to filter the material on their site to check the performance of the machine. The Technical Director of Filtration Co described this as:

"…what we don't know is how long it will work for, what kind of throughput you gonna see, how consistent is their feed, how consistent is their performance. So we send out to the client, they will connect it up and they will run it for maybe two to three weeks at their place. We don't do anything now. We kind of step back, because they need to see it operating, they need to control it; they need to adjust it to make sure it does what they need.

According to the Technical Director of Filtration Co, during the process of testing the filtration machine at the customer site, which might take up to four weeks, Filtration Co provide technical support as needed to familiarise the customer with the machine. Modifications on the machine are also included if required or requested by the customer. Once the customer is satisfied with the performance of the filtration machine, they are asked to validate the process and to verify that the performance of the machine meets their needs.

In the next stage, Filtration Co and Citric Acid Co will have a meeting to discuss the final specifications of the filtration machine such as the size of the rotary drum, the diameter of the filter and types of discharge. After the meeting, Filtration Co is ready to design the final filtration machine based on the specifications given.

After about three weeks, Filtration Co sends the quotation to Citric Acid Co with the updated design of the filtration machine. At this stage, a negotiation process takes place between Filtration Co and Citric Acid Co, where they will come to an agreement on such issues as the payment terms and the service maintenance contract. Figure 4.3 shows the three units of the bespoke filtration machine at Filtration Co factory, ready to be delivered to the Citric Acid Co.

Figure 4.3: Three units of the bespoke filtration machine ready to be delivered to the customer

4.6 The Case of Turbine Co - BU

This section will provide a detailed account of the background of Turbine Co, as a supplier and their customer, BU. It also includes the service offered by Turbine Co and the contracting process with their customer.

4.6.1 Background of Turbine Co

Founded in 1984, Turbine Co is the fourth largest wind turbine manufacturer in the world and has been the market leader in Germany since the mid-nineties. As of December 2017, Turbine Co has installed more than 26,300 units of wind turbines across the world. The evidence provided here derives from initial interviews with the Customer Relation Coordinator of Turbine Co, their company official website and internal documents.

Turbine Co offers new technology in their wind turbine, characterised by their ground-breaking gearless drive concept, which removes the need for the gearbox and serves to underline the unique power of their innovation. In addition, all the wind turbine components are subject to ongoing and systematic development, which enables Turbine Co to maintain their technological edge over their competitors.

Turbine Co caters to a wide market range, from supplying the single unit of wind turbine to farmers to supplying it to the larger utility's companies across the world. The Customer Relation Coordinator of Turbine Co stated:

> "*…we have the motto for the company which is "Energy for the World", and that is because we won't discriminate, whether it was just a big wind farm or big utilities. You could get a farmer or a land owner who wants a piece of turbine…so we are quite unique as we supply single turbine to farmers, land owners, cooperative groups… but also do large wind farm to a larger utilities companies and wind farm developers, etc…*

Turbine Co not only sells the wind turbine but also provides after-sales services to their customers. This will be elaborated under Section 4.6.3, which details the services offered by Turbine Co.

4.6.2 Background of customer: BU

The customer that was chosen for this case is Bay University, a Higher Education Institution in the UK. BU bought one unit of the wind turbine from Turbine Co several years ago.

4.6.3 The Services Offered by Turbine Co

With the company motto "*Energy to the World*", Turbine Co offers a wide range of services to their customers. Turbine Co knows that preparation of a wind energy project required huge effort and needs help from experts. As Turbine Co has extensive expertise and many years of experience in the field of project development, they are able to offer comprehensive support to their customers during the entire project planning stage. This includes providing customers with the information and advice on request on possible operating company structures, preparation of leases and allocation formulas as well as project organisation ahead of a new wind turbine project.

In addition, in the early stage of project development, Turbine Co also provides the services such as the creation of the wind farm layout, access road plan, design of the grid connection and substation. It also includes the access roads, crane platforms, creation of risk evaluation reports, turbulence analysis, stability analysis, and profitability forecasts.

In the next stage, after the customer has bought the units of wind turbine from Turbine Co, they offer maintenance packages called TPK (Turbine Co Partner Konzept). This TPK Maintenance Package includes regular maintenance services where the technical engineers from Turbine Co will inspect the wind turbine on a regular basis. It also covers the repairs and change spare parts if necessary. Turbine Co does not charge for spare-parts or main components if they fall within standard machinery breakdown and downtime insurance covers general remaining risks. The customer has peace of mind since they do not need to make financial provisions for larger repairs for the wind turbine unit. Table 4.5 shows the service offered by Turbine Co from pre to post – installation phase.

Table 4.5: Services offered by Turbine Co

Services offered	Pre - installation	Post - installation
Designing layout	✓	
Manufacturing the product	✓	
Delivering the product	✓	
Installing the product	✓	
Training and consulting		✓
Maintaining the product		✓

4.6.4 The Contracting Process

This section describes the process of contracting that Turbine Co, as a manufacturer, and BU as a customer, went through in relation to the contract agreement of buying one unit of wind energy converter (WEC) and the service maintenance package. Interview data from the both Turbine Co and BU, contract documents (with the complete annexes) and multiple

organisational documents including email exchanges were used to put together the description for the process of contracting.

4.6.4.1 The BU Contract

The initial steps in this case was started when the Executive Board of BU (specifically under Renewable Energy Division) had a meeting and came to a decision to acquire one unit of wind energy converter, (referred to hereinafter as Wind Turbine) for the organisation. This is because they wanted to generate renewable energy sources and support a green and sustainable environment by reducing carbon emission.

According to the Energy Manager of BU they had conducted a thorough preliminary research before they started looking for potential suppliers for the Wind Turbine. The research was vital for BU to find out important information such as the possible location to locate the wind turbine, how it will be connected up to the main power supply, how to maintain as well as the overall cost that will incur. The Energy Manager of BU recalled the process:

> *"In terms of history of this particular contract and this particular relationship, University need to reduce carbon emissions and reduce energy costs. So having the wind turbine is the good way of doing that. So it sort of went through the process whereby we (the board of the Director of Renewable Energy Division) constructed the details design of the wind turbine…such as where it will be located, how it will connect electronically, how we control… and we went up to tender.."*

After about six months preliminary research BU moved to the next stage of searching for a few potential suppliers of wind turbines specifically in the UK and Europe. For this stage,

BU prepared the Invitation to Tender (ITT) documents in which were drafted all the requirement and specifications of the wind turbine that they were looking for. This document was then sent to potential suppliers across the UK and Europe and who were invited to submit their proposal and bid for the tender. According to the Energy Manager of BU, five proposals were received in response to the ITT.

BU reviewed and evaluated each of the proposals and shortlisted three potential suppliers who were invited to present their proposals in detail at a meeting with the Board of Directors of Renewable Energy Division.

At the interview with the personnel from Turbine Co, the current manufacturer who got the tender eight year ago recalled the important elements in the presentation of the proposal to the BU that time, he pointed out:

> *"...from our perspective as a manufacturer, we need to, one, make sure that the price is competitive compared to other manufacturers. But in terms of our technology, we need to make sure that we can demonstrate how efficient it is, how reliable the backup and the support of our financial strength. We have minus AA credit… so again you know in terms of financial standing that hopefully will give the purchase reassurance… customer reassurance dealing with the big, experience… manufacturer that would be in business."*

After the selection process, Turbine Co was chosen as the supplier of the Wind Turbine for BU. Before the contract was awarded, a few elements were negotiated such as the price, the payment term and the contract maintenance service.

At the end of the process, BU and Turbine Co representatives sat down together and to draft the contract agreement. The Sales and Marketing Manager of Turbine Co said:

"…so we will have someone like myself from Sales, and someone from Turbine Co Legal Team, and they will have BU, their technical engineer and their lawyers. The lawyers will look at the legal aspect of the contract, on what they like and they don't like… the technical engineer will be looking at the service requirement or issues with getting to the site.."

Figure 4.4: The wind turbine blades delivered at the BU site

Chapter 5

Analysis

5.1 Introduction

The aims of this chapter are to address the two research questions as stated in Chapter 2. Section 5.2 presents the evidence from the case studies with regard to the first research question: “How does the contract shape the specifications of the customer’s role and responsibilities in service delivery?”. Section 5.3 provides the evidence from the case studies pertaining to the second research question: “How is service delivery in a servitization context co-produced with the customer after contract stipulation?”.

5.2 Contractual governance in shaping customer roles

Section 5.2.1 analyses the specifications of the customer’s role and responsibilities in service delivery. In addressing this issue, it is important to uncover three related areas of inquiry: contract functions in shaping customer roles (Section 5.2.2), lack of contractual capability (Section 5.2.3) and identifying the customer in the service delivery phase (section 5.2.4).

5.2.1 Specification of customer roles and responsibilities in service delivery

The case study evidence and analysis of the data of how contractual governance shape the roles and responsibilities of the customer in the service delivery phase is presented here. As described in chapter 4, the service delivery phases are those of (i) pre-installation services including designing, manufacturing the bespoke product and delivering the product to the

customer site and (ii) post–installation services including training and consulting, trouble shooting and preventive maintenance services. Empirical evidence from interviews, contract documents and email exchanges are used.

5.2.1.1 Playground Co – Sea Life Co

Based on interviews with Playground Co's managers and the review of the contract documents, the responsibility of the customer (Sea Life Co) during pre- installation process is to ensure that the access to the site is permitted without any disruption. Even though the responsibility for allowing the access appears to be an easy job for the customer, this was highlighted as an important element by the Customer Service Manager of Playground Co during the interviews. The reason behind this is Playground Co relies on the customer's input (i.e. allowing access to the site) in order to complete the installation of the playground within the agreed time. To strengthen this point, two clauses are stipulated in the contract to safeguard Playground Co in the event that the installation work is delayed because of the interruption at the customer's site. The contract document states:

> In the event that the start of the work is delayed or the work is disrupted by interruptions or any other cause whatsoever, or by the Customer's instruction or lack of instructions, the Company shall be entitled to charge a reasonable amount for any extra cost incurred.
>
> Contract documents Playground Co – Sea Life Co

Another clause that was stipulated in the contract to highlight the consequences of any delays to installation because of the customer is quoted as follows:

> We reserve the right to make an increased charge in the event that the completion of delivery and installations is delayed by reason of the customer's instructions or any other reason…
>
> Contract documents Playground Co-Sea Life Co

As Playground Co admitted that the co-production roles played by the customer is important to ensure they can complete the installation within the agreed time, they also took into consideration any working restriction at the customer site during the contract negotiation process. This is to ensure that their technical team have unobstructed access to the site to install the product. According to Playground Co's Customer Service Manager:

> *"we also discuss with our clients any working restriction beforehand, so they (customer) may say 'you can't be on site before 8 o'clock in the morning and you must be off the site by 4pm'"*

In the post installation phase, particularly during the preventive maintenance service, the certified inspectors from Playground Co visit the customer's site to conduct the annual inspection of the playground equipment. Similar to the pre-installation phase, but not written specifically in the contract, the customer obligation is to ensure they can provide full access to the inspectors to carry out a thorough non-dismantling inspection in compliance with European safety standards. In so doing, the customer will be given early notice to help them with the planning because they might need to close their operation for the public in order to give proper access to the inspectors. According to the Customer Service Manager of Playground Co:

"the client will be contacted, to let them know when our inspectors [are] expected to be on site, which day we expect to be there, how long we expect to be on site".

Secondly, customer obligations in the post-installation phase (i.e. during the maintenance service) stipulated in the contract to be present on site to meet the engineers and inspectors. This is necessary as the inspectors will provide the hints and tips for routine inspections, such as tightening of loose bolts and fastenings, rounding off sharp or splintered edges, and untangling of swing chains and seats.

5.2.1.2 Playground Co – Community Group

Similar to the case of Sea Life Co, Community Group also carry out the same roles and responsibilities during the pre-installation phase. Firstly, they have to ensure that the installation team from Playground Co are able to gain the proper access to the site in order to install the playground equipment within the agreed time.

Secondly, as the playground equipment is going to be installed in a public area, Community Group also need to apply for the working permit, if needed by the local council, and put up the appropriate signage near the site. This is important to ensure that the engineer and the staff from Playground Co have wide access for unloading the materials and the machine for digging the area before installing the playground parts in the ground. These two roles of the customer are found in the formal contract documents.

Since, in this case, Community Group does not buy the maintenance packages from Playground Co, there is no roles and responsibilities stipulated in the contract for post-installation service.

5.2.1.3 Excavation Safety Co – Piling Co

On reviewing and analysing the contents of the formal contract agreement in this case, it was found that there were specific sections or clauses dedicated to shaping the customer's roles and responsibilities during the pre and post - installation service delivery.

Firstly, in the pre-installation phase, the customer's obligation regarding unloading and loading equipment at the site is specified. As mentioned in the previous chapter, the size of the equipment involved in this project is big and heavy steel. Hence, the co-production roles and responsibilities of the customer is crucial to ensure the equipment can be loaded and unloaded at the site safely. Furthermore, as Piling Co is one of the sub-contractors involved in this project, there are many other activities by other contractors, which run simultaneously. The Technical Manager of this project has highlighted this:

> *"our equipment is the biggest section, it's about 10 meters, we need to drop it in (as the upper section is already there)…we did the lowest section of the piling job…a lot of activities are going on".*

One specific section in the contract document specifies the customer's obligation during loading and unloading the equipment at the site:

> Unloading and Loading
> The Hirer shall be responsible for the unobstructed access and egress…for unloading and loading of the Plant at the site; and any personnel supplied by the Owner for such unloading and /or loading shall be deemed to be under the direction of control of the Hirer.
>
> Contract document: Excavation Safety Co – Piling Co

Secondly, in the post - installation phase, as this case falls under the category of use-oriented services, one section has been written in the contract to specify customer obligation during the renting period. This is to emphasize that the customer should be responsible for any loss or damage of the equipment throughout the renting period. This part is important to safeguard the supplier because the equipment tends to get damaged as it involves a lot of other jobs around the piling sheets. The specific section in the contract that specified this obligation states:

> Hirer's responsibilities for loss and damages
>
> For the duration of the Hire Period (which for the avoidance of doubt, includes the time Plant is left on site during a Holiday Period), the Hirer shall…make good to the Owner all loss of or damage to the Plant from whatever cause…fair wear and tear accepted.
>
> In the event of loss of or damage to the Plant, hire charges shall be continued…until the settlement has been agreed.
>
> Contract document: Excavation Safety Co – Piling Co

According to the interview with Excavation Safety Co's Project Manager, this clause is vital because there was an issue at the end of the hire period, when the equipment was returned to the depot in a damaged condition, which was beyond the accepted level of wear and tear. He said,

> "*sometimes it can be bit drawn out…if they damage it but they don't tell us, we need to look at what's going on, we do report and sometimes they…not be honest with you".*

Thirdly, the customer's obligation has also been captured in the contract regarding their roles and responsibilities to immediately report to the supplier if there is any accident

involving the plant at the customer's site. This is important for the supplier to ensure that if in the case the customer does not have a contractual obligation to compensate for losses to the supplier, they have to get the consent from the supplier before proceeding with further related action. The clause in the contract is as follows:

> Notice of Accidents
> If the Plant is involved in any accident resulting in injury to persons or damage to property, immediate notification must be given by the Hirer to the Owner by telephone and confirmed in writing to the Owner no later than 24 hours…In relation to any claim in respect of which the Hirer is not bound to fully indemnify the Owner, no admission of liability, offer, promise of payment of indemnity shall be made by the Hirer without the Owner's prior written permission.
>
> Contract document: Excavation Safety Co – Piling Co

5.2.1.4 Filtration Co – Citric Acid Co

In this case, the supplier has designed and manufactured the customized filtration machine to allow the customer to filter their citric acid. There are two main responsibilities of the customer that they need to carry out during the pre-installation phase. Firstly, in the beginning of the process, the customer needs to send their sample of citric acid to the supplier, to ensure the supplier can design the filter machine according to their specific need. The details of this process of this stage have been discussed in section 4.5.4.1. Secondly, in the delivering process, as this filtration machine has been manufactured in the UK and needs to be delivered at the customer site in Belgium, the customer is responsible to make sure they are ready to receive the equipment as scheduled. This includes providing adequate

access to the building and assisting the process of unloading the equipment to the site. This point is since crucial large and heavy equipment is involved. Surprisingly, these two main responsibilities of the Citric Acid Co do not feature in the final contract document. The data from interviews and email exchanges reveal that this part of customer roles and responsibilities was only discussed at the meeting and both parties had decided to treat it informally through trust when delivering the services. Similarly, no specific clause was to be found in the formal contract that specified the roles and responsibilities of the customer in the post-installation services.

5.2.1.5 Turbine Co – BU

In the case of Turbine Co and BU, customer obligations have been captured in the formal contract for both phases; pre and the post -installation of the wind turbine . Turbine Co's managers emphasize that the customer has important roles to play from the beginning of the pre- installation of the wind turbine until the end of the contract agreement. Thus, the evidence found from the contract agreement shows that one sub-section in the contract called "The Employer" was created to specify the customer's obligations during the pre-installation and the whole period of the service contract, that is 25 years.

Firstly, during the pre - installation process, it has been stipulated in the contract that the customer is required to provide proper access for the service provider to carry out the necessary task of installing the turbine. In addition, the customer also has to provide necessary equipment such as crane hardstands and other related equipment that comply with the standards stated by the supplier. This obligation has been clearly stipulated in the contract, as follows:

From the beginning of the installation Period until the end of the Operation Period of the Contract, the Employer (BU) shall safeguard at his own cost, risk and expense that all site roads, crane hardstands and other working areas have an adequate carrying-capacity and breadth and comply with the Contractor's (Turbine Co) road and crane requirements in order to ensure that the Contractor has unimpeded access to the site…

Contract document Turbine Co - BU

The installation process of the wind turbine is considered complicated compared to the case of Playground Co. Furthermore, the customer's obligation is just not merely allowing the access for the contractor to the site, but also carrying out important roles in providing crane hardstand and other equipment during the installation. It was also highlighted in the interviews that the service provider was relying on the customer's input (by fulfilling the entire specified obligations in the contract) in order to make the wind turbine fully operational as they promised.

> *"…we are relying on that aspect for the turbine to be fully operational…the site road, so from the field entrance up to where the turbine will be installed is reliant on the customer…they have to provide that, the crane hard standing, they have to provide that, if that substance that when we turn up and the crane fall off, is their fault, not our fault…" (Turbine Co's Operation Manager).*

Secondly, in the post – installation phase when the contractors are conducting a scheduled service maintenance on the turbine, the customer is also responsible in ensuring that the service technician team are able to get access to the site. In the event that the service

technician had hindered access to the turbine, the customer is liable for the consequences of that failure:

> *"if we can't get access to the site and there is a stopped turbine, and there is too much snow on the road, and we can't get in, the service technician can't get in to repair it and that … until the road is get clear by the customer, we classified that time…so that time doesn't affect our availability because it is a part of the contract…the customer has to maintain access to the turbine"* (Turbine Co's Operation Manager).

The evidence from the contract also shows that there is one sub-section written in the formal contract to capture the event where the customer fails to provide proper access to the site and there is disruption to the service delivery. It is stipulated that:

> if in respect of the access roads and crane hardstands, the Employer (BU) fails to comply with its obligations…The Contractor (Turbine Co) if he would fall behind schedule with the services due to the default, may undertake all necessary measures to rectify such default instead of the Employer, and any cost incurred by the Contractor in connection therewith, including any delay damage suffered by the Contractor, shall be for the account of the Employer.
>
> Contract document Turbine Co - BU

When the scheduled service maintenance is due, the Turbine Co technician team will contact the customer to notify that they will be on site to conduct the inspection and regular services; hence, the customer has to allow the access to the site. One of the emails sent to the customer to notify the maintenance visit, states:

Dear Customer,

We will be attending your windfarm to carry out the task below:

Windfarm Name: Bay University, Wind Turbine

Planned task: Rectifier fault

Date and Time: 17/17/ 2017

If you require any further information, please contact Customer Relations.

Kind regards
Mr. T
Service Administrator, Turbine Co.

Apart from that, the contract also stipulated that the customer is responsible to provide a system called SCADA (Supervisory Control and Data Acquisition) which is a control system architecture that uses computers and networked data for the high-level process of supervisory management. This is required for the service provider to monitor the performance of the turbine and provide related service maintenance.

5.2.2 Contract functions in shaping customer role

This section discusses and analyses the findings from the case studies pertaining to the contract functions in shaping the customer roles and responsibilities in service delivery. Apart from the interviews, the rich data from the full set of contract documents across all the case studies were used. The comparisons between the cases were made based on the Tukker typology (Tukker, 2004) (i.e. product-oriented service, use-oriented service and result-oriented service) to explore the function of the contracts in shaping the specifications of the customer's roles and responsibilities in the service delivery across the servitization categories. The operationalisation process of categorising the function of the contract, whether it categories as a safeguarding or coordination tools, are based on the prior literature (see

Mayer and Argyres, 2004; Selviaridis, 2016). For example, the clauses that describe the incentives as a remedy for the performance failure or risk are associated with the safeguarding function, whereas the clauses that outline the roles of customer in synchronisation and integration of service activities is classified as coordination function. It also examines the differences in contract structure depending on the level of services offered. The analysis of the contract documents focuses on the specific clauses and terms that specify the roles and responsibilities of the customer during the pre- and post–installation stages of service delivery.

5.2.2.1 Product-oriented service (POS)

The next section presents the evidence from the two case studies that are representative of product-oriented services (POS): Playground Co with Sea Life Co and Playground Co with Community Group.

5.2.2.1.1 Playground Co – Sea Life Co

The analysis of the contract document for Playground Co – Sea Life Co reveals that two functions of the contract were used in stipulating the roles and responsibilities of Sea Life Co during pre-installation phase. The first function of the contract is safeguarding where it stipulated the responsibilities of Sea Life Co to ensure access to the site is unobstructed. The safeguarding functions of the contract can be seen when the contracts stipulates that if there is any work delay or disruption because of the customer's lack of instruction (i.e. failure to provide necessary access for Playground Co during the installation process), the service provider shall be entitled to charge a reasonable amount for any extra cost incurred as a result of the delay. In addition to that, the contract also clearly stipulated the consequences of the

delivery and installations is delayed because of the customer, Playground Co reserve the right to make an increased charge for the total cost of the project.

Further analysing the contract document for the Playground Co – Sea Life Co case, it has also found that the safeguarding functions of the contracts in the event of late delivery or delay in the installation stage. A clause in the contract had stated that Playground Co would not be liable (should not be penalised) for any failure to meet the dateline of the project as seen below:

> Any date quoted for commencement or completion of installation is an estimate only. The Company shall not be liable for any failure to meet any such estimation nor for any loss, whether financial or otherwise resulting directly or indirectly therefrom. The time for completion of installation shall not be of the essence.
>
> (Source: Contract documents Playground Co-Community Group)

Furthermore, there is also another safeguarding function of the contract through the clause that highlights the responsibilities of the Sea Life Co for examining the product delivered and installed by the service provider and for notifying the service provider of any defects or shortages within five days of delivery. If the Sea Life Co fails to do this, Playground Co will not be responsible for any loss or damage to the equipment.

The formal contract provision also provided the arrangement between Playground Co and Sea Life Co to discuss the for any working restriction beforehand. This is important to ensure both parties have an adequate information about the site project before starting the process of delivering and installing playground equipment.

In terms of the number of clauses to safeguard and coordinate the process of service delivery, it was found that there are four clauses featured in the formal contract for this case, which is in pre – installation stage.

5.2.2.1.2 Playground Co – Community Group

A similar pattern of the contract structure is to be found in the case of Playground Co – Community Group where there are four items in the contract that specify the roles and responsibilities of the customer during the delivery and installation process of the playground equipment. Even though two different contracts were used in the two cases the clauses highlighting the customer's roles and responsibilities are similar. This is mainly to safeguard Playground Co against possible future contingencies because of the failure from the customer's side.

The analysis of the contract documents of both these case studies under this category shows that there is no clause specifying the roles and responsibilities of the customer during the maintenance service process. It also shows that apart from describing the payment terms and other related items, the contract was mainly used to stipulate and shape the roles and responsibilities of the customer during the installation phase.

5.2.2.2 Use-oriented service (UOS)

The next section is the evidence of the case study of Excavation Safety Co and Piling Co under the category of use – oriented services.

5.2.2.2.1 Excavation Safety Co – Piling Co

The case of Excavation Safety Co – Piling Co represents the category of use-oriented service where the equipment remains owned by the service provider, while the customer

pays for the use of it. Thus, as service provider, Excavation Safety Co are responsible for the maintenance, repair and control of the equipment and make sure that the equipment is functioning well.

The analysis of the contract document for this case reveals that there are three clauses that stipulate Piling Co roles and responsibilities during pre - installation process of the equipment. As discussed previously, Excavation Safety Co have limited knowledge and information on how things work at the customer site, therefore they rely on the Piling Co for information (i.e. providing input) during the installation process. This has been clearly written into the contract as:

> The Hirer (Piling Co) is deemed to have knowledge of the site or the property or land where the Plant is to be delivered and the Hirer warrants that the condition of the site or place of delivery of the Plant is suitable for the use of such Plant.
>
> Source: Contract document Excavation Safety Co – Piling Co

This specific clause stipulated in the contract document under the sub-section 'Unloading and Loading' specifies the roles of the Piling Co in assisting the Excavation Safety Co. This clause was written to highlight the fact that the customer is responsible for giving instructions and controlling the process of unloading and loading the Plant at the site project. This clause is stated in the formal contract to coordinate the process of service delivery, highlighting the need of working together between Excavation Safety Co and Piling Co.

A further clause in the contract document highlights a similar coordination function which stated that Piling Co needs to guide the Excavation Safety Co in handling of the Plant. It states:

When a driver or operator or any person is supplied by the Owner (Excavation Safety Co) with the Plant, … such person shall be under the direction and control of the Hirer (Piling Co). Such drivers or operators or persons shall be regarded as the servants or agents of the Hirer (Piling Co).

Source: Contract document Excavation Safety Co – Piling Co

After the equipment or plant has been installed, several clauses are stipulated in the contract regarding the roles and responsibilities of the Piling Co in the post – installation phase. Seven items were written in the contract under the sub-heading "Hirer's responsibility of loss and damage" which served as safeguarding functions for Excavation Safety Co. These clauses were stipulated to ensure that if there were any damages to the equipment during the renting period the customer would be responsible.

5.2.2.3 Result-oriented service (ROS)

The two case studies that represent the category of result-oriented service (ROS) are Filtration Co – Citric Acid Co and Turbine Co – BU. This section begins with the analysis of the contract design of Filtration Co and their customer Citric Acid Co. ,followed by the case of Turbine Co – BU.

5.2.2.3.1 Filtration Co – Citric Acid Co

In the case of Filtration Co and Citric Acid Co, the analysis of the contract document surprisingly revealed that no specific clauses were used to stipulate the roles and responsibilities of the customer during the process of service delivery. The only part that highlighted customer's responsibilities was under the section 'Payment Term' where it was

specified that the Citric Acid Co must make the payment to the Filtration Co within a certain number of days according to what was agreed upon.

Interestingly, the contract had dedicated quite a long list pertaining to the responsibilities of the Filtration Co regarding the function of the filtration machine. Among the responsibilities are:

> The Contractor (Filtration Co) guarantees that the delivered, installed and commissioned equipment has full conformity with the terms of the contract and has been realised according to the highest standards and quality. He (Filtration Co) further guarantees that the equipment is free of defaults due to design, manufacturing, erection or commissioning services failure.
>
> Source: Contract document Filtration Co – Citric Acid Co

According to the interviews with the Managing Director of Filtration Co, one of the reasons that the contract design has been heavily focussed on Contractor responsibilities rather than customer responsibilities is the fact that the contract had been prepared by the customer. Even though the content is subject to discussion and agreement between the two parties, Filtration Co did not add any section on highlighting the roles and responsibilities of the Citric Acid Co but only reviewed the contract that was given to them. Managing Director of Filtration Co mentioned this as:

> *"They send the contract through to us… They sent through [the] contract file, and there are certain terms and conditions in there where we will either agree or disagree… and there will be some period of discussion".*

5.2.2.3.2 Turbine Co – BU

In this case, Turbine Co had provided the availability warranty (i.e. performance-based guarantee) where they assured the customer that the wind turbine would be able to produce certain amounts of output (e.g. X amount of KwH of electricity in X amount of time). This is in line with Tukker's (2004) definition of result-oriented service where the service provider agrees with the client for the delivery of a predetermined result. According to the interview with the personnel from the customer's firm, it was mentioned that what the supplier offered to them in term of availability warranty was:

> *"the turbine generates Kw/h of energy (electricity), and for every Kw/h energy generated, we pay…a rate of so many pence (£) to Contractor (Turbine Co). They warrant an average availability of (xx%) per wind turbine, if they don't meet that (breach of the availability of warranty) they will pay us"* (Energy Manager of BU)

This important element of the result-oriented service also had been clearly stipulated in the contract and quoted in the contract documents under availability warranty as:

> The Contractor shall plan and conduct the Services in order to ensure that during the Operation Period the Wind Farm meets the availability figure defined in the Particular Conditions, based on a period of time of one Operation Year
>
> If the Availability of the Wind Farm within one Operational Year neither meets nor exceeds the warranted Availability; compensation shall be due to the Employer for the loss of energy resulting from such shortfall (hereinafter "Compensation").
>
> Source: Contract document Turbine Co – BU

The analysis of the provision in the contract document had looked closely at the roles and responsibilities of BU during the service delivery process in order to ensure the Turbine Co were able to deliver the 'guaranteed result' as stated in the contract. Three clauses which stipulated the roles of the customer during the installation phases were found. These included: provide unimpeded access to the site, safe working areas with adequate carrying-capacity and breadth which comply with the Contractor's road and crane requirement and providing the specific permits for the transport of wind turbine and materials on roads. This is mainly to safeguard Turbine Co for any possible failure by specifying what customer should do during the process of service delivery.

Interestingly there were eleven clauses and terms in the contract that stipulated the role and responsibilities of the customer in post – installation phase (i.e. throughout 25 years of service maintenance contract) in order to safeguard the Turbine Co. This clearly shows that Turbine Co need the customer to do their jobs as they supposed to, to ensure the process of service delivery and guarantee successful delivery. As quoted in the contract highlighting customer obligations:

> During the term of the Contract, the Employer (BU) shall…operate the Wind Farm in compliance with the manufacturer's operating instructions and within the design limits applicable for each Wind Farm…comply with all statutory and legal requirements necessary for the operation of the Wind Farm.
>
> Source: Contract document Turbine Co – BU.

Among the roles and responsibilities of the customer stated in the contract were that during the term of the contract the connection from the wind turbine to the main power

supply (grid connection) must always be available. Other terms included: maintain a permanent telephone line or broadband connection to the central building for the exclusive use of remote monitoring and control of the wind turbine by the Turbine Co; cooperate with the Turbine Co to the extent reasonably required for the performance of any obligation under the Contract. The analysis of the contract documents reveals that the distribution of the clauses and terms in the contract that specify the roles of the customer were heavy on the post – installation phase (i.e. maintenance services throughout the term of the contract).

As the contracts contain lengthy wording in the light of legal terminologies and language, it is deemed useful to quantify the contract structures through the number of clauses allocated in the contracts. In other words, it aims to show a higher number of contractual arrangements in the form of a longer and more detailed contract, consisting of more clauses to safeguard the supplier. Table 5.1 summarises the number of clauses in the contract provision which specify customer roles and responsibilities in two phases: pre and post installation. Table 5.2 provide the summary of the key findings related to the contract functions in shaping customer roles in service delivery phase.

Table 5.1: Distribution of the customer roles in contract provision

Types of servitization	**Case studies**	**Pre-installation**	**Post-installation**
Product-oriented	Playground Co-Sea Life Co	4 clauses	No clause
	Playground Co - Community Group	4 clauses	No clause
Use-oriented	Excavation Safety Co - Piling Co	3 clauses	7 clauses
Result-oriented	Filtration Safety Co – Citric Acid Co	No clause	No clause
	Turbine Co - BU	3 clauses	11 clauses

Table 5.2: Summary of the contract functions in shaping customer roles.

Service delivery stage	Product – oriented	Use – oriented	Result– oriented
Pre – installation	▪ Safeguarding	▪ Coordination	▪ Safeguarding
Post – installation	▪ Coordination	▪ Safeguarding	▪ Coordination

5.2.3 Lack of contractual capability

This section discusses the issue pertaining to a lack of contracting capability in the servitization firm in specifying customer roles in the service delivery phase which resulted in tension in the relationship with the customer. Empirical evidence from the case of Filtration Co with their customer Citric Acid Co is presented. It is important to highlight that this issue was not set up to be investigated in the original plan of this research; however, as data collection progressed I found that the failure of the contractual mechanism, related to lack of capability of manufacturers to clearly specify the roles and responsibilities of the customer, was interesting and important to discuss. The next section provides the evidence for this issue.

5.2.3.1 Filtration Co – Citric Acid Co

Based on the empirical evidence gathered, both parties had agreed and signed the contract agreement in mid-June 2011. Two months later, in early August, Filtration Co notified Citric Acid Co that the filtration machine was ready for shipment to their site in Belgium. By the end of August, all the three units of filtration machine had been installed at their final location at the Citric Acid Co site.

However, something went wrong one month after the installation. In early October, Citric Acid Co contacted Filtration Co and reported that the filtration machine had failed to produce

the output as promised in the contract. As such, they would withhold payment to Filtration Co. The Technical Director of Filtration Co recalled this issue during the interview as:

> *"... when we first installed the filters, they didn't work…there was the problem with the… the throughput was very very low. It was supposed to do… and we did all the test... it was supposed to do about 47 tons an hour through the machine. And when they were installed, they only give about 30 - 35 tons an hour which is much much lower than the design capacity. And one of their directors threatened me not to pay the final invoice which was about 20% of the total contract, which has basically wiped out our profit of it...".*

An email from the Managing Director of Citric Acid Co to Filtration Co also expressed dissatisfaction about the failure of the vacuum drum filter units:

"…when we ordered the filters from your company, one of the factors driving our decision has been the fact that your company has some experience in the citric acid business. Unfortunately, it did not serve us until now. I got to the conclusion that the equipment you delivered is not suitable to do the job that has been described in our quote for offers. … Because there seems to be no reliable plan in place how to solve this problem, I will consider to replace the filters by an alternative solution and to give back the filter back to you. We should discuss then how and when you can reimburse the cost, we had so far…".

Source: Email from Managing Director, Citric Acid Co

This issue created tension in the relationship between the Filtration Co and Citric Acid Co. Filtration Co then conducted a thorough investigation into the possible causes for the

filtration machine underperforming just one month after the installation. The problem came as a shock for the Filtration Co because during the installation process the machine had gone through a trial production and had produced a favourable result. This was stated in the email thread to the customer:

> The filter has achieved 55m3/hr, and this has been confirmed by your colleagues at Citric Acid Co both verbally and via email. The throughput for each filter is a target value of 47m3/hr". It has been clearly demonstrated that the filter run at design capacity and has, in fact, run in excess of design capacity. The fact that you are currently running below design capacity has nothing to do with the filter.
>
> Source: Email from Technical Director of Filtration Co

Since the throughput had dropped significantly from 52m3/hour to 35m3/hour just one month after the installation, Technical Director of Filtration Co suspected that there might be something wrong with the feeding material. Surprisingly, the Manager of Technical Department of Citric Acid Co provided the information regarding the cause of failure, as quoted in the email thread below:

> "….at greater than 0.5rpm the cake thickness reduced thereby making discharge more difficult".
>
> Source: Email from Manager Technical Department, Citric Acid Co

After finding out the cause of the failure, the Technical Director of Filtration Co made a clear justification to the customer on this issue. An email below was sent to the customer.

"…if the filter cake is thin and difficult to filter then this is yet another clear indication that the feed material has changed – possibly particle size distribution or solids concentration or both… you clearly have issues with the consistency of your feed suspension and this is what has been apparent to us since the filter was commissioned. We have no control over your feed material, and this is a matter you need to address yourselves".

Source: Email from Technical Director of Filtration Co

An in-depth analysis of the provision of the contract documents was made to find out what the main causes for this were. From the perspective of the Citric Acid Co, they had done nothing that could have led to the failure of the machine and laid the blame on the manufacturer for failure to design the vacuum filter according to their needs. However, from the perspective of Filtration Co, they could not be blamed if the customer did not use the machine as it should be used thus causing its failure.

Nonetheless, the analysis of the provision in the contract documents clearly showed that it did not specify clearly the roles and responsibility of the customer in managing the input during the use of the machine. The customer had changed the input to increase productivity and this was causing the failure of the machine. After a thorough discussion, the Filtration Co admitted that no specific volumetric rate was stated in the final contract. Even though the requirement for a process guarantee was discussed during the negotiation of the contract it had not been included in the final contract documents.

This empirical evidence has revealed that Filtration Co failed to clearly specify customer roles and responsibilities in the post-installation phase, particularly that of using

the filter machine in accordance with the design capacity. It was also found that the process of specifying customer roles took placed in the pre-installation phase with individuals from Citric Acid during the contract negotiation but the input from the meeting failed to be communicated to the personnel who would be directly involved in the operation of the machine in the post – installation phase. This clearly indicates that there are multiple customers from a customer firm who are involved in the process of service delivery. The next section continues to explore this issue of identifying multiple customers in the service delivery phase.

5.2.4 Identifying the customers in the service delivery phase

In the previous analysis, it was shown how the formal contract provision is used to specify the roles and responsibility of the customer in the service delivery phases and its function in shaping those roles. However, it is still unclear who is the individual within customer's firm that interact with the service provider during the service delivery phase. It is argued that by shedding light into the process of identifying who the individual customer is within the customer's firm who interacts with the service provider in providing input at different stages and how they are interdependent is crucial for effective service delivery.

Furthermore, it is noticeable that the literature has discussed the components of the Unified Service Theory (UST) (i.e. inputs, customer and production process) from the perspective of a simple and straight-forward service delivery process, particularly in the B2C setting. The service contexts are limited to simple daily life activities such as hairdressing services, fixing the car at the garage or having treatment at the hospital. In this setting, the process of service delivery is relatively simple because it only involves one individual as a

customer. For instance, an individual goes to the dental clinic for a teeth scaling service. He or she is the main customer who provides the input (i.e. himself/ herself) and later makes the decision whether the service provider shall be compensated for production (Sampson and Froehle, 2006). Figure 5.1 illustrates the process of service delivery in this simple B2C setting involving only one customer.

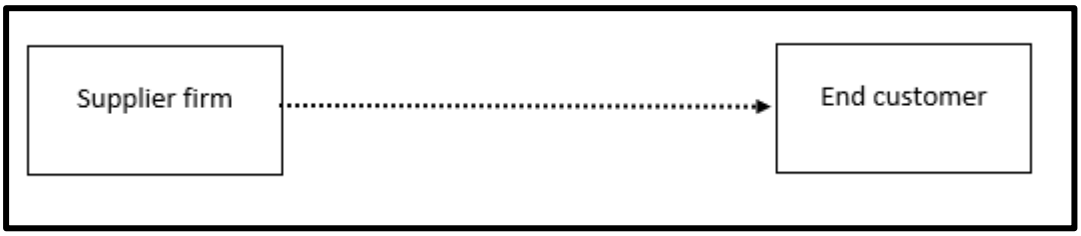

Figure 5.1: Process of service delivery in B2C setting

However, the production of services and the service delivery process are more complicated and complex in the B2B setting, particularly in servitization setting. Therefore, this section presents the empirical evidence of the cases and the analysis pertaining to the process of identifying the individual customer in service delivery phase in the light of UST framework.

5.2.2.1 Playground Co – Sea Life Co

In this case, a few individuals from various departments in Sea Life Co were involved during pre -installation service phase, particularly in purchasing activities such as in the tendering process, shortlisting the potential supplier and in the contract awarding process. At the beginning of the tendering process the top management from Sea Life Co including the Managing Director, Head of Sales and Marketing department, Finance Manager, Contract Manager and Project Manager were involved in providing the inputs to develop the invitation to tender (ITT). This group of people were also directly involved in the selection process of

the potential suppliers until the contract was awarded to the Playground Co. Thus, each of these individuals from Sea Life Co can be considered a customer who is providing input in the pre – installation service delivery phase.

Later on, in the next process of pre – installation phase (i.e. manufacturing activities) only one person from Sea Life Co interacted with the supplier - the Project Manager. During this interaction the design and layout of the playground was confirmed to have been according to the specifications that had been agreed upon. The project completion time was also checked to be in line with the dateline that had been set up by Sea Life Co. Hence, at this stage the Project Manager is the customer who has to be satisfied with the work progress of Playground Co.

As the process of service delivery moved along, Playground Co delivered and installed the playground equipment at the Sea Life site and had a direct interaction was with a few individuals/direct customers. This stage began with the scheduling of the delivery with the site supervisor, who had to make sure access to the site was permitted without any obstruction. The Project Manager of Sea Life Co then also got involved through monitoring the progress of the installation process to ensure it ran according to the actual plan. Once the installation was completed, the next stage in post – installation was preventive maintenance services where Playground Co sent their inspector to conduct periodic service maintenance at the Sea Life Co site. At this stage, the individual who acts as customer for Sea Life Co is an Engineer in the Health and Safety Department who interacted directly with the maintenance team from Playground Co during their visit to the site. This interaction with the inspectors involved checking all the playground equipment and guiding the customer to have their own weekly checks to ensure that the safety aspect was adhered to.

5.2.2.2 Playground Co – Community Group

In the case of Playground Co – Community Group, fewer individuals than the above case acted as customers in providing the inputs. This is because the size of the Community Group, a volunteer organisation, is relatively small. At the beginning of the service delivery in pre – installation phase, the process of making the purchasing decision involved three people in the organisation: The President, Treasury and Secretary of the Community Group. They were responsible for providing the inputs in terms of the design of the playground, financial information on budget constraints, and location.

During the production process, there was no involvement by Community Group since Playground Co produces standardised equipment. There was also no specific individual who was appointed as the project manager on behalf of the Community Group.

Next, when the Playground Co went to install the playground at the customer site, a few individuals from Community Group who worked as volunteers for this organisation need to be present at the site to ensure that access to the site was clear and unobstructed. There was no service maintenance involved after the installation of the playground due to the choice made by Community Group to save costs.

5.2.2.3 Excavation Safety Co – Piling Co

In the case of Excavation Safety Co – Piling Co, quite a few individuals were involved in making the purchasing decision and contributing inputs into the production process. Firstly, at pre – installation of service delivery phase, where the process of designing the product took place, the designer, engineer, estimator and project manager of Piling Co were involved as customers in contributing the inputs in the form of the specifications for the project, the

duration of the project and the financial information regarding budget constraints. For example, the engineer and designer from Piling Co met with the sales team from Excavation Safety Co to provide the details of the excavation safety frame that they required. As mentioned previously, Piling Co was one of the sub-contractors in this project who also provided detailed information about other concurrent activities which would take place simultaneously at the site. This was important to ensure that Excavation Co had a clear picture of the situation when planning to deliver and assemble the equipment at the Piling Co site.

Secondly, when the production of the equipment took place, the individuals from Piling Co including the engineer and project manager were involved to ensure the product had been made according to their specifications. Excavation Safety Co as a supplier needs to satisfy these individuals who act as customers representing Piling Co before they can deliver the services at the next stage.

Thirdly, in the next service delivery process, various people from Piling Co were needed to contribute the inputs (i.e. allowing the access, assisting in the installing process) to make sure the process of delivering and installation of the equipment can be done successfully. This began with scheduling the day and time for the delivery which was crucial because the site workers, engineers and Project Manager from Piling Co had to be ready at the site to receive the equipment. According to the interview with the Operation Manager of Excavation Safety Co, they did not know how things worked at the site and relied on Piling Co to help them unload and install the equipment. Furthermore, as mentioned previously, there were other on-going activities at the site.

5.2.2.4 Filtration Co – Citric Acid Co

The pre – installation phase of service delivery in this case required significant inputs from the Citric Acid Co because the supplier Filtration Co, design bespoke filtration machines tailored to the unique needs of their customers. The detailed account of this process has been explained in section (4.5.4.1). At this stage, the individuals from Citric Acid Co responsible for providing inputs and interacting directly with the supplier firm were the Managing Director, Manager of Technical Department and Technical Engineer. These front-line people initiated the purchasing decision to buy three units of filtration machine for filtering their citric acid and can be identified as the customers at this stage.

The next phase is the production for the three units of bespoke filtration machine, where it took place in the supplier's factory in the UK. During this process the Managing Director and the Manager of Technical Department of Citric Acid Co interacted with the Filtration Co to monitor the progress of the production process. Apart from checking the progress of the production they acted as customers to make sure the design and specifications of the machine were being made according to their needs. This was revealed through the series of discussion email exchanges between the Manager of Technical Department of Citric Acid Co and the Managing Director of Filtration Co who also mentioned that he sent the photos and videos of the progress of the production to the customer. In addition, the important customer from Citric Acid Co who determined the compensation of the supplier for production was the Manager of Finance and Controlling. This aspect is important because payments were agreed in the contract based on the rate of working progress.

Once the manufacturing activities for the filtration machine were completed, the next step in the process was to deliver and install the machine at the Citric Acid Co site in Belgium. As this involved big and heavy equipment, both organisations had to plan well to ensure the equipment could be delivered without any obstruction. Thus, the individuals who played important roles in providing the inputs (i.e. allowing the access) were the Technical Engineers, Plant Supervisor and site workers of Citric Acid Co. According to the interview with the Technical Director of Filtration Co who was directly involved in delivering and installing the filtration machine to the customer's site, this process was very complicated and challenging for both parties.

> *"the problem was, how do we get the filter in there (in the building). It's not an easy problem, that's why it takes a long time because even knowing where you want to get the filter, but how you get it in the building. Some client will have to take the roof off and lowered it down from the top, some client needs to take the entire wall off to bring it in, it is not an easy job to do…"* (Technical Director of Filtration Co)

Thus, the inputs and the roles and responsibilities of Citric Acid Co are not only to contribute to the purchasing decision and determining whether Filtration Co shall be compensated, but also involve the direct interaction and co-production activities of various members of their organisation who act as the customers, in ensuring the production of service delivery can be delivered successfully.

5.2.2.5 Turbine Co – BU

In the case of Turbine Co – BU, this involved quite a lengthy process at the pre – installation of service delivery, specifically at the purchasing process because this was the

first time that BU was buying a unit of the wind turbine for their organisation. According to the interviews with the Energy Manager of BU, the beginning process of planning, identifying the appropriate location to install the turbine and developing an invitation to tender took approximately six months. The individuals who were directly involved in making the purchasing decision were the members of the BU Executive Board, Energy Manager, Engineer and Legal Advisor (acting as contract manager). There was no direct involvement from BU during the process of manufacturing the wind turbine at the Turbine Co factory in Germany. This was because the unit of the wind turbine that was purchased by BU was a standardised product without any special modifications on the design. However, the Energy Manager was the main contact from BU for receiving updated information on the manufacturing progress and the overall project completion time for installing the wind turbine.

At the stage of delivering and installing the wind turbine at the BU site, quite a few individuals from BU were needed to provide their inputs and interact directly with Turbine Co. These included the people from the Security Office who were responsible for controlling the traffic because the delivery of the piece of wind turbine involved moving a huge. This is an important step at this stage to ensure that the wind turbine was delivered to the site without any obstruction. The Engineer Manager and the team from Turbine Co then took over and were responsible for carrying out the task of providing and installing the crane hardstand for digging the hole to install the base of the wind turbine. This was considered a highly important input that the customer must provide to ensure the crane did not fall over during the process of installation. As mentioned previously, a clause had been stipulated in the contract regarding the role and responsibility of BU during the installation process. After the wind turbine had been installed, the individuals who acted as customers for BU were the Electrical Engineer and the team. They were responsible for providing the input necessary to

assist the Turbine Co in connecting the energy generated from the wind turbine to the grid power supply system of the BU.

As service delivery would continue for 25 years and the Turbine Co had been awarded the preventive maintenance contract to conduct the periodical maintenance activities on the wind turbine, the individual who acts as customer in providing input (i.e. access to the site) and interact directly with the technician from Turbine Co is the Energy Manager who also makes the decision whether or not Turbine Co shall be compensated for the service production. (i.e. for maintenance services). Table 5.3 summarises the customers in pre and post - installation of service delivery for the five cases studies.

Table 5.3: The customers in pre and post - installation phases of service delivery

Case studies	Pre-installation	Post-installation
Playground Co – Sea Life Co	▪ Managing Director ▪ Head of Sales & Marketing dept. ▪ Finance Marketing ▪ Contract Manager ▪ Project Manager	▪ Site supervisor ▪ Project Manager ▪ Engineer of Health & Safety dept.
Playground Co – Community Group	▪ President ▪ Treasury ▪ Secretary	▪ Volunteers
Excavation Safety Co – Piling Co	▪ Designer ▪ Engineer ▪ Estimator ▪ Project Manager	▪ Site workers ▪ Engineers ▪ Project Manager
Filtration Co – Citric Acid Co	▪ Managing Director ▪ Manager of Technical dept. ▪ Technical Engineer ▪ Manager of Finance and Controlling	▪ Technical Engineer ▪ Plant supervisor ▪ Site workers
Turbine Co – BU	▪ Members of Board Executive LU ▪ Energy Manager ▪ Engineer ▪ Legal Advisor	▪ Security and traffic control team ▪ Engineer Manager ▪ Electrical Engineer ▪ Energy Manager

5.3 Co-production in service delivery

This section answers Research Question 2: *"How is service delivery in a servitization context co-produced with the customer after contract stipulation?".* In addressing this research question, it is important to uncover two related of areas of inquiry: customer co-production roles in service delivery (Section 5.3.2) and the process mapping service delivery activities using the PCN diagram (Section 5.3.3).

5.3.1 Process of co-production

This section presents case study evidence and analysis of the co-production process in service delivery. Apart from interview data, documentary data sources including contract documents and email exchanges were used to provide rich description and analysis of the case studies. Whereas the involvement and participation of the customer at the stage of designing the service offering have been thoroughly researched in the servitization literature (e.g. Ruiz-Alba et. al., 2019; Santamaria et al., 2012; Schaarschmidt et al., 2017) little attention has been paid to customer participation (in the co-production process) at the stage of service delivery.

5.3.1.1 Playground Co-Sea Life Co

In the case of Playground Co and Sea Life Co, the process of service delivery starts from the pre – installation (i.e. pre-sales services stage) where Playground Co offers consultancy and design services to their customer during the initial site visit at the customer site. At this stage, co-production activities with the customer take place when the Area Manager from Playground Co sat together with Project Manager of Sea Life to discuss and get necessary information such as the size of the playground site, the number of units of

equipment needed, the sort of design and theme ,and the customer budget. The Customer Service Manager explained:

> *"so, we went to the site, we measured the size of it and got the brief (i.e. size of playground, numbers of playground equipment, design and the theme) from the client…"*

This input/information from the Sea Life Co is very important in order for Playground Co to come out with a sound proposal. The information gathered during the site visit is then passed on to the designer team at the Playground Co Head Office to create scaled plans, 2D illustrations and 3D walkthroughs as part of the proposal for the customer. This evidence clearly shows Playground Co rely on the information provided by the customer through co-production process to deliver these pre-sales services successfully.

Once the proposal has been accepted and the tender is awarded to Playground Co, the next stage of service delivery is to install the set of playground equipment at the Sea Life Co site. At this stage, the co-production activities are in the form of customer supplying crucial information to ensure the process of installation runs smoothly without disruption. Hence, Sea Life Co has to observe their roles and responsibilities for allowing easy access to the contractors and engineers from Playground Co during the process of the installation. As mentioned in the previous section, this co-production activities from the customer point of view may look easy but, in some instances, some of the delay in the project completion time is due to restricted access to the customer site. This is an important reason for a specific clause to be included in the contract document to formalise this co-production process in the service delivery of installation of the playground equipment.

Later on, at the post - installation phase, the co-production process with the customer starts when the inspectors from Playground Co visit the playground site to conduct routine inspection on the equipment. Apart from allowing the inspectors and maintenance team access to the site, the co-production activities here require the customer and inspectors from Playground Co to be present at the site. This is pre-requisite for the process of inspection as mentioned by Customer Service Manager:

> *"…when our inspectors visit the clients, we need them to be around so that we can inspect the items and show the customers what item needs to be replaced and …(also) show them what they need to do for their own routine inspections"*

5.3.1.2 Playground Co – Community Group

In the case of Playground Co and Community Group, the co – production process in pre – installation phase is quite similar to the Sea Life Co case above. The only difference is that in this case, the co – production process during the installation of the playground in the Community Group's site is quite complicated. This is because the process of installation is done in the public area where the customer (Community Group) need to play their co-production roles effectively to ensure the process of installation runs smoothly. The co – production process includes ensuring the area is accessible to the contractors and putting necessary signage at the site to keep children and the public safely away while work is in progress. This is because the site for the installation of the equipment is in the local community area. There is no co – production process in the post – installation phase as Community Group did not buy the service maintenance package.

5.3.1.3 Excavation Safety Co – Piling Co

In the case of Excavation Safety Co and Piling Co, the evidence from the case study shows several co – production process where manufacturers rely on customer input to deliver the services. The co-production process of service delivery started at the pre- installation phase (i.e. pre – sale services) where Piling Co provides the input in the form of specification of the product, design, budgeting and project deadline. As being explain in the description of the case in Chapter 4, Excavation Safety Co produce bespoke product for Piling Co for this project, therefore the co-production process is in the form of building the "solution" which is considered as a crucial process. This is to ensure that Excavation Safety Co were able to design, manufacture and deliver the product as requested by Piling Co.

The co-production process with the customer continues when the manufacturer delivered the equipment at the construction site. As the Piling Co was involved directly with the construction activities at the site, Excavation Safety Co relied on Piling Co completely to provide them with information and assistance with unloading the equipment at the site. This co -production process includes the process of loading the equipment at the site, which requires employees from Piling Co to provide the access to the site, guiding the process and assisting the process of loading and unloading the equipment .

Moreover, the co – production process with the customer also happened during the process of installing the product (piling sheet) on the ground. This process required Piling Co to assist by providing specifications of the project and working collaboratively with the employees from Excavation Safety Co at the site.

5.3.1.4 Filtration Co – Citric Acid Co

In the case of Filtration Co and Citric Acid Co, the co-production activities with the customer begins at the pre-sales service when Filtration Co provides the service of customisation of the filtration equipment according to the unique needs of their customers. At this stage, the co – production process takes in the form of customer providing the sample of the liquid citric acid to the Filtration Co to build the proto-type of the filtration machine. This process is very important because the manufacturer relies on this input to design the bespoke filtration machine that will be suitable for the sample given by the customer.

Later on, in delivering the services of installation of the equipment at the customer premises, the manufacturer relies on the co – production process with the customer to provide necessary access to their site. According to the Technical Director of Filtration Co, the process of delivering and installing the equipment for Citric Acid Co is very difficult and complicated. This is for two main reasons. Firstly, it involves three units of filtration equipment big in size and made of heavy steel, and secondly, the equipment has to be transported from the UK to the customer site in Belgium. In addition to these two reasons, the process of unloading the equipment at the customer site is extremely difficult because of space constraint (i.e. a narrow entrance). The evidence from the interviews with the Technical Director of Filtration Co reveals that the input from the customer in terms of providing information and working together to install the equipment is very crucial for them to deliver this service.

The next stage of co-production process takes place at the post – installation stage when the Filtration Co conducting maintenance and routine inspection after the equipment has been installed. The co – production activities with the customer here includes providing

access to the filter machine and having scheduled temporary shutdown of a production plant to allow the maintenance service work to be done.

5.3.1.5 Turbine Co – BU

In the case of Turbine Co and BU, a few co–production processes with the customer took place. Firstly, in the pre – installation phase (i.e. pre – sale stage) , the co – production process takes place in the form of the customer was providing information regarding the specifications of the wind turbine that they wanted, grid connection of the wind turbine and the specific place to install the turbine. At this pre-sale stage, the information provided by the customer is essential for Turbine Co as it will affect the price of the quotation offers and the maintenance package offered to the customer.

Co-production with the customer also occurred during the stage of installation of the wind turbine at the customer's site. This is the most critical part of co – production process where the manufacturer totally relies on customer input to ensure they can install the turbine successfully. An important input that was needed from the customer in the form of crane hardstand and other related equipment. Operation Manager of Turbine Co highlights this:

> *"…they have to provide crane hardstand. If we turn up (to install the turbine) and the crane falls off, that is their fault"*

Finally, the co – production process takes place at the post – installation phase (i.e. service maintenance stage). At this stage, BU need to play their roles to make sure the site is accessible when the technician and maintenance team from Turbine Co come to conduct regular services or change the part of the turbine. This is a crucial co-production process because if there is restriction to the site for any reason the manufacturers will be hindered when they turn up to inspect and service on a regular basis. Consequently, if there is any

interruption to the turbine and the performance available is not achieved, the manufacturer cannot be held responsible and should not be penalised by the customer. The Sales and Services Manager of Turbine Co give an example of this issue as he said:

> *", if there was a group of cattle around the turbine and we can't get to the turbine to conduct the services, then if the turbine is not working and not achieving the performance guarantee, we should not be penalised because it is not our fault".*

Table 5.4 provide the summary of the co–production process for all the case studies.

Table 5.4 : Co–production process in service delivery

Case studies	Co – production process	
	Pre – installation	**Post – installation**
Playground Co – Sea Life Co	▪ Designing the playground ▪ Allowing the access to site	▪ Allowing the access to site ▪ Be present during inspection
Playground Co – Community Group	▪ Designing the playground ▪ Allowing the access to site	
Excavation Safety Co – Pilling Co	▪ Designing the bespoke equipment ▪ Assisting the delivery process	
Filtration Co – Citric Acid Co	▪ Designing the bespoke filter machine ▪ Allowing the access to site ▪ Assisting the delivery process	▪ Allowing the access to site
Turbine Co – BU	▪ Developing proposal & maintenance package ▪ Assisting in delivery and installation	▪ Allowing the access to site

5.3.2 Customer's co-production roles

The extant servitization literature has been dominated by research that focused on the single organization perspective which viewed servitization in a unilateral manner where the manufacturers play the key role in delivering servitized offerings (Bastl et al., 2012; Ruiz-Alba et al., 2019). This stream of literature has paid less attention to the customer's role. Acknowledging the importance of the customer's roles in providing servitized offerings, this

section aims to present and analyse the evidence of the case studies pertaining to customer's co–production roles in the servitization context.

In order to examine the customer's co- production role in servitization context, the Unified Service Theory (UST) proposed by Sampson and Froehle (2006) has been adopted. According to the UST, the service production process relies on customer input because the customer acts as the main supplier for the service process. The literature has suggested three common types of customer inputs: the customer's self, his belongings and his information (Wemmerlov 1990). This categorization will be used here to analyse the co-production roles of the customer in the service delivery phases in a servitization context.

In addition, in discussing the three common types of customer inputs, it is noticeable that the literature has put more focus on the simple and daily service operation in B2C context. The analysis from this section aims to extend the customer's co – production role in providing inputs (i.e. customer's self, tangible belongings and information) in a more complex B2B setting, particularly in a different servitization context.

5.3.2.1 Customer's self

The first type of customer input that is essential in the service execution process is input on the customer's self. This involves the physical presence of the customer in the co-production process in the service delivery. Sampson and Froehle (2006) drew an example from the pure service context as in the health care services where the service provider cannot execute the actual service process (i.e. give the treatment) until necessary customer-self inputs are present. Similarly, the hair salon workers cannot start the service process of hair cutting unless the customer is present in the shop. This is the most common example of the

situation where the customer has to present themselves to the service provider for the process of service intervention to be started.

However, these examples have a very narrow focus in service offering in a B2C setting and there is little in the literature that looks at 'customer's self-input' in the more sophisticated and complex B2B setting, particularly in servitization setting. It is deemed important to shed light on this issue because providing the 'customer's self-input' in the B2B context does not entail personal services as illustrated in the B2C examples above. It is argued that by focussing on this, a clearer picture of how the customer can play their co-production roles in a servitization context can emerge. The next section provides insight into how customers play their co–production roles of providing 'customer's self-input'.

5.3.2.1.1 Providing access and facilitating service process

In all the cases, the co-production role of the customer in providing 'customer's self -input' into the service process being performed is that of by being present at the site during the process of delivering, installing and maintaining the equipment at their premises to allow access. For example, in the case of Playground Co and two of their customers (Sea Life Co and Community Group), it is stated clearly in the contract document that the customer must ensure that there is no obstruction to the site during the service delivery process. Thus, the customer needs to assign their staff to be present at the site at certain agreed times to ensure access to the site.

Similarly, in the case of Excavation Safety Co – Piling Co, the customer needs to provide their 'customer's self -input' (i.e. their workers at the power station plant) to receive and guide the process of loading and unloading the excavation equipment at the site. The evidence from the case also shows that the process of service delivery will be hindered if the

Piling Co's people are absent from the site because the Excavation Safety Co people did not have any idea about the work that going on in the power station plant.

In another two cases (Filtration Co – Citric Acid Co and Turbine Co – BU), the 'customer's self-input' is crucial because the service delivery in this case is much more complicated. The reason is the size of equipment in these cases which is not only big and heavy but the process of delivering and installing the product relies heavily on the co-production activities with the customer. For instance, Filtration Co was having difficulties installing the three units of filtration machine at the customer's premises due to the space constraint. However, with the presence of the customer providing the access and facilitating the service process, Filtration Co managed to install the equipment successfully. As for the Turbine Co, the process of delivering the part of the wind turbine to the customer's site was complicated and needed assistance from the customer to control the traffic and provide a wide access to the site.

The evidence from all the cases shows that customers perform their co-production roles in providing 'customer's self-input' by someone being present at the site to provide access and facilitate the service process. Importantly, the service delivery cannot be executed unless the customer is present to allow the access and assist the service process.

5.3.2.2 Tangible belongings

The second type of customer input that is crucial in the service execution process is the customer's tangible belongings. This refers to the property and physical objects that belong to the customer (Sampson and Froehle, 2006). In the B2C context, this category of input has been illustrated with the customer's car as an essential input for the garage in order

to deliver the repair services, and in another example, the customer's clothing is a prerequisite input to the dry-cleaning service process (Sampson and Froehle, 2006).

One of the most noticeable patterns in the example of B2C context given in the literature is the process of providing the input of tangible belongings by the customer bringing their property to the service provider to get the service. As mentioned in the example above, the customer brings the car to the garage for repair or clothes to the laundry shop for dry cleaning services.

However, the findings from the case studies offer an interesting insight since the case studies represent three different types of servitization. This has an impact on the tangible belongings input because in product-oriented services (POS), the ownership of the product is transferred to the customer at the moment when the customer pays. However, in the use-oriented services (UOS) and result oriented services (ROS), the ownership of the equipment remains with the service provider (Tukker, 2004). The next section discusses the impact of this difference on the provision of "tangible belongings".

5.3.2.2.1 Product-oriented services (POS)

In the two cases in this category, the service provider transferred the ownership of the playground equipment to the customer at the moment when the customer pays. Thus, the process of providing the tangible belongings' input (i.e. playground equipment) for the service execution process is by allowing access to the playground site at all times because the equipment is located at the customer's premises. This is particularly true in the case of Playground Co with Sea Life Co when the service provider needs to conduct periodic preventing service maintenance on the playground equipment for five years after the installation.

5.3.2.2.2 Use-oriented services (UOS)

In the case of Excavation Safety Co and Piling Co the tangible belongings for the excavation safety equipment remains under the ownership of the service provider, Excavation Safety Co. This has an impact on what providing tangible belongings input means. The findings from this case show that instead of the customer providing inputs by bringing their belongings to the service process, they assist the service provider by giving the information about the site (i.e. loading and unloading activities). This role is discussed in the next section under information input.

5.3.2.2.3 Result-oriented services (ROS)

Two cases that represent the category of result-oriented services (ROS) are Filtration Co – Citric Acid Co and Turbine Co – LU. Interesting insights in these two cases expand the definition of result-oriented services provided by Tukker (2004) where "the client and provider in principle agree on a result, and there is no pre-determined product involved" (Tukker, 2004, p.248). Tukker (2004) gives an example of pay per service scheme as the user no longer buys the product, only the *output* of the product according to the level of use (Tukker, 2004, p.249). However, in the case of Filtration Co – Citric Acid Co, the customer has bought three units of filtration machine and the ownership of this product has been transferred at the moment when customer pays. Similarly, Turbine Co sells the wind turbine to BU and provides the availability warranty in the service maintenance packages. Quoting the Sales Manager of Turbine Co in highlighting this service package:

> *"So this package…what it does is that they (the customer) pay the service fee each year based on how much they produce in the previous year. So they pay a rate based on how much turbine produce…if they are have really good windy year, the turbine will*

generated more, they will get more electricity, they will make more income. The service package costs are production (kWh) based and thus predictable. A turbine performing badly means costs for Turbine Co, but not for the owner as availability warranty is given and underperformance is financially compensated."

Another interesting insight is into how customers provide the tangible belongings input to enable the service execution process. The findings from both cases show that the customer roles are those for allowing proper access to the service maintenance team to the site to conduct regular preventive service maintenance. This is because the product is located in the customer's site and providing access to the site is prerequisite to the service process.

Also, in the case of the Turbine Co – BU, as mentioned in the previous chapter, the co-production roles of the customer in providing tangible belongings include the provision of crane hardstands during the installation of the wind turbine. This is considered as a tangible belonging input provided by the customer to assist the service provider to deliver the installation services.

5.3.2.3 Customer-provided information

The third type of input needed in the service production process is customer- provided information. Sampson and Froehle (2006) illustrate this in the example in a B2C setting; the service of preparing for a tax return requires the customer to provide their financial information to enable the services process. The findings from the case studies though have shown that the process of providing the information is more complex and important even at the earlier stages of designing the service offering.

Evidence from the case studies shows that the manufacturers rely on the information provided by the customer to design their servitized offerings. For instance, in the case of Filtration Co – Citric Acid Co, the manufacturers offer the "solutions" by customizing the filtration machine according to the customer's specifications. In order to deliver this service to the customer, the manufacturer relies on the customer to provide them with basic information about the materials by sending the sample of the materials to be tested. The manufacturer cannot execute the service process (i.e. build the customized filtration unit) until they have received the necessary information and sample of citric acid from the customer.

Similarly, for Excavation Safety Co – Piling Co, the manufacturer relies on input from the customer (i.e. information on the specifications of the project), to deliver the "solution". As mentioned, Excavation Safety Co had provided design services, installation guidance, supply of equipment and aftercare for the bespoke fabricated safety frame to Piling Co in their power station project. Thus, at the beginning of the service-offering the customer has to provide the necessary information and specifications of their project to enable the manufacturer to design the bespoke frame accordingly. In addition, at the later stage when the equipment is delivered to the site, information from the customer to specify the dates and times of delivery and installation of the equipment will be required. This is a crucial stage in the process because there are lots of other construction works running simultaneously on the site and the equipment involved is big and heavy. Without precise information from the customer, the service delivery process may be disrupted.

Evidence from Turbine Co-BU shows that the customer is responsible for providing information to the supplier via the SCADA (Supervisory Control and Data Acquisition) system.

In order for the service provider to deliver the maintenance services, input from the customer is needed. The interview with Turbine Co's Sales Manager highlights that if there are issues of inconsistent connection or lack of data through this system the service maintenance process may be hindered.

In addition, the findings from the case studies also reveal that the customer also plays a significant role in providing information during the service maintenance phase. This includes providing necessary information to the service maintenance team for conducting the diagnosis for machine breakdown. This is seen in the case of Filtration Co with their customer, Citric Acid Co when there was an issue with their underperforming filtration machine. As discussed in the previous section the cause of the problem was found after the investigation when the customer had provided all the necessary information for the diagnosis. Table 5.5 summarises the customer co-production roles in providing inputs in the service processes.

Table 5.5: Summary of customer co–production roles in providing inputs in the service processes

	Playground Co - Sea Life Co	Playground Co – Community Group	Filtration Co – Citric Acid Co	Excavation Safety Co- Citric Acid Co	Turbine Co- BU
Customer-self inputs	• Be present during inspection services	• Be present in assisting the installation process	• Be present in collaborating with supplier in delivery and installation services	• Be present in supporting the process of loading & unloading materials at the site	• Be present in assisting traffic control during delivery & installation services
Tangible belongings	• Provide access to the installation & service maintenance team	• Provide access to the installation team	• Provide access to the installation team	• Provide access to the installation team	• Provide access to the installation & service maintenance team • Provide crane hardstand • Provide SCADA systems
Information	• Supply information about the design of the playground	• Supply information about the allocated budget for buying the playground unit	• Supply information and sample for customized production • Supply information regarding the delivery arrangement	• Supply information for bespoke unit of excavation frame • Supply information regarding the delivery arrangement at the site.	• Supply information for the maintenance service through SCADA system.

5.3.3 Mapping service delivery process using the Process Chain Network (PCN) diagram.

This section illustrates the process of service delivery in servitization settings using the Process Chain Network (PCN) diagram which enables the visualisation of the participation of the customer throughout the process of service delivery. As proposed by Sampson (2012), customers may interact with the supplier in two ways: providing input that is essential for the service process, and directly participating in the actual execution of the service process. Section 5.3.3.1 shows the analysis of customer interaction for the category of product-oriented services (POS) which consisted of the case of Playground Co and two of their customers - Sea Life Co and Community Group. Section 5.3.3.2 discusses and analyses the category of use–oriented services (UOS) presenting the case of Excavation Safety Co – Piling Co, and lastly Section 5.3.3.3 provides the evidence from the category of result–oriented services (ROS) in the case of Filtration Co – Citric Acid Co and Turbine Co – BU.

5.3.3.1: Product-oriented services (POS)

5.3.3.1.1 Playground Co – Sea Life Co

The PCN diagram in figure 5.2 shows the service delivery process for the case of Playground Co and Sea Life Co. On the left side of the diagram, the process starts in the independent processing regions of the customer site when Sea Life Co (customer) plan to buy a set of outdoor playground equipment for their theme park. They then prepare an Invitation to tender (ITT) document to be sent to a few potential suppliers that had been identified. The process of contacting the suppliers in order to communicate the ITT occurs in the direct interaction region where the interaction between customer and supplier takes place through email exchanges and telephone conversations.

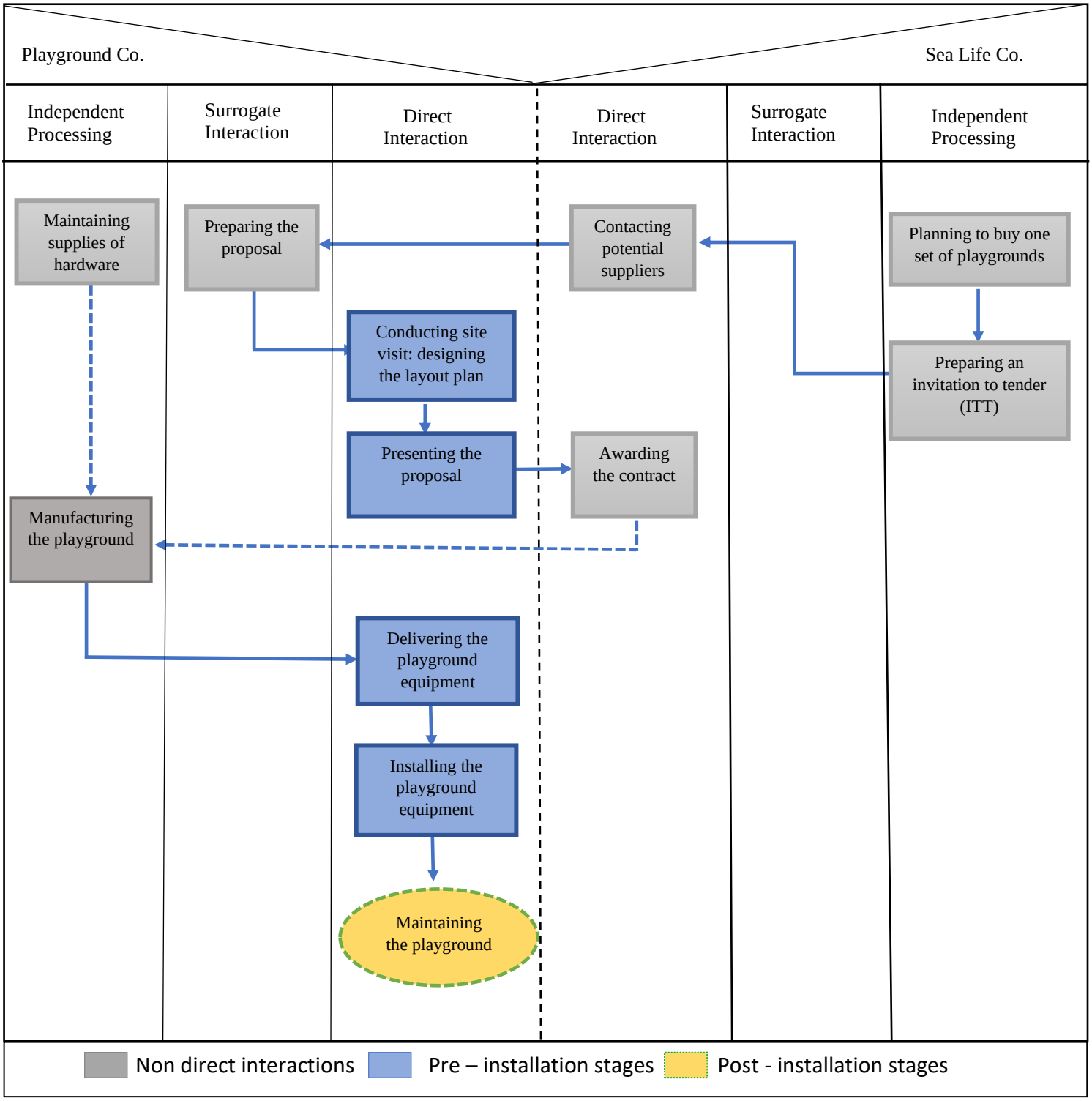

Figure 5.2: PCN diagram for service delivery process in Playground Co -Sea Life Co

The next steps involve the surrogate processing region on the right-hand side of the diagram, when Playground Co (the service provider) prepares the quotation. The process of developing the proposal uses information provided by the customer through ITT. Two service processes in this pre – installation phase involve direct contact with the customer ; the process of conducting a site visit to design the layout of the playground and presenting the proposal.

After that, once the contract has been awarded to the supplier, the process of manufacturing takes place in the surrogate processing region as this activity involves a bespoke design for the playground, to be manufactured based on specific requirements of customer preferences. It then progresses to the next three service activities include the process of delivering the playground to the customer's site and installing them on the ground. Lastly, at the post – installation phase, the process of service delivery occurred in the direct interaction region where the inspectors from Playground Co provides preventive periodical service maintenance for the playground equipment.

It is important to point out that unlike all the other activities in the diagram which are presented in rectangular boxes, the maintenance services use a circle with dashed lines. This is to differentiate the one-off activities from this repetitive activity which requires direct contact with the customer each time service maintenance takes places over the 5 years as in the maintenance contract.

5.3.3.1.2 Playground Co – Community Group

As seen in figure 5.3 (PCN diagram for the service delivery process of Playground Co and Community Group), there are three activities in the direct interaction region. As was mentioned in Chapter 4, the Community group project is relatively small and there was no

formal tendering process. When the Community Group members had decided to buy one small unit of playground equipment to be installed in their neighbourhood area, they contacted Playground Co directly to ask for a quotation.

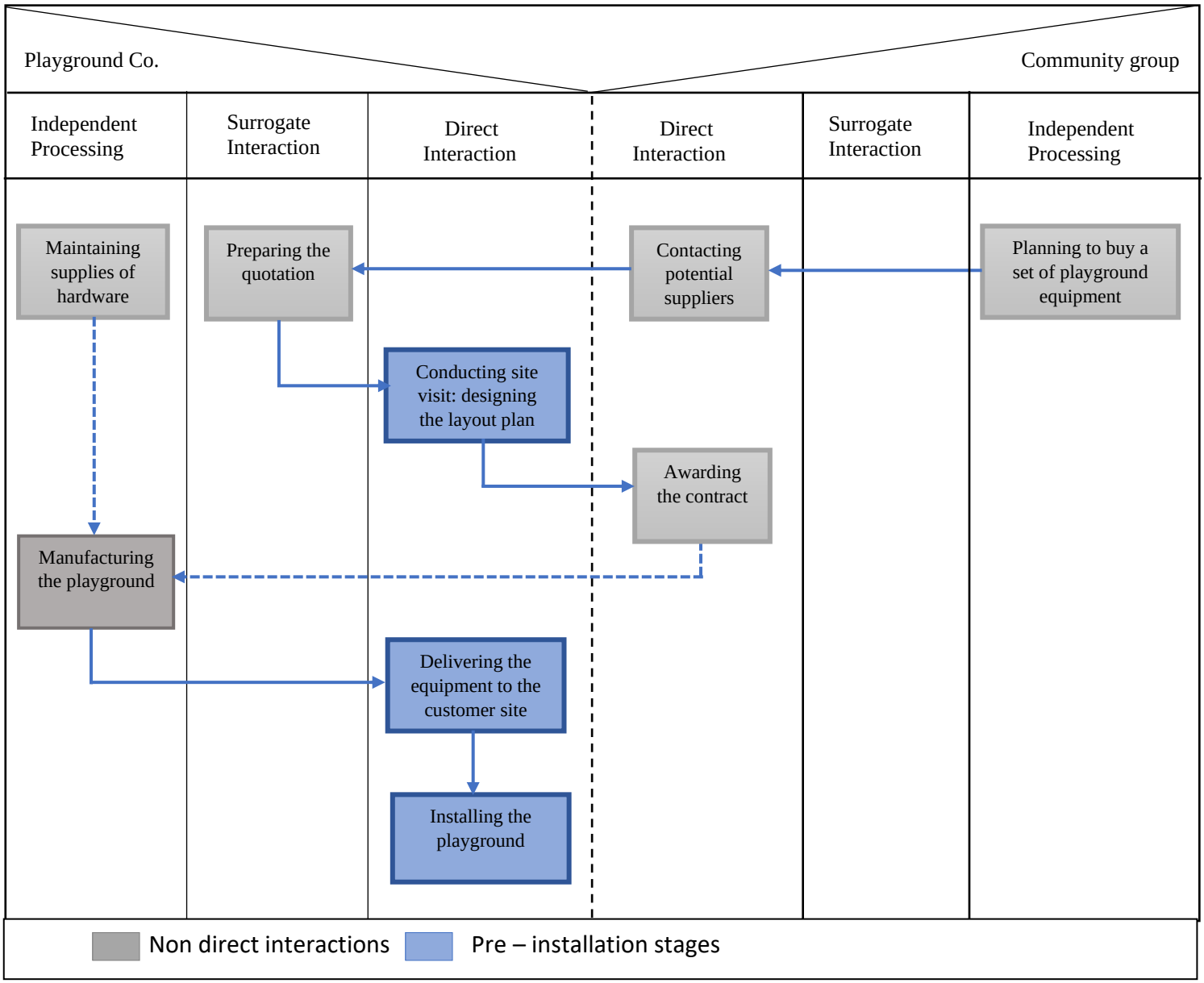

Figure 5.3: PCN diagram for the service delivery process of Playground Co -Community Group

The process starts in the direct interaction region as shown in the diagram with the conducting site visit to design the playground according to the Community Group budget. The next step occurs in the surrogate processing region where the Playground Co prepares the quotation based on the information gathered during the site visit. Once the customer has agreed on the proposal and signed the contract, the next stage in the diagram is the manufacturing activities stage which takes place in the independent processing region as they involve standardised production which Sampson (2001) referred to as 'make-to-stock'.

This brings the process to next stage of service delivery which includes the process of delivering the playground equipment to the customer site and installing it. These two activities require direct involvement from the customer, and they had to be present to provide the necessary input into the service process as described in the previous section.

5.3.3.2 Use – oriented services (UOS)

5.3.3.2.1 Excavation Safety Co – Piling Co

Figure 5.4 above shows the PCN diagram for mapping out the service delivery process in the case of Excavation Safety Co and Piling Co. The first service process provided by Excavation Safety Co is developing the proposal by designing the 3D plan for the bespoke excavation safety equipment for the special project at the power station of their customer, Piling Co. This is displayed in the surrogate interaction region because it involves nonhuman resources (i.e. the information provided by the customer). The next stage is the manufacturing of the bespoke filtration machine. The reason this activity is mapped out in the surrogate interaction region is because it involves the customer's input for a bespoke design. This is in line with what Sampson (2012) called 'make-to-order production'.

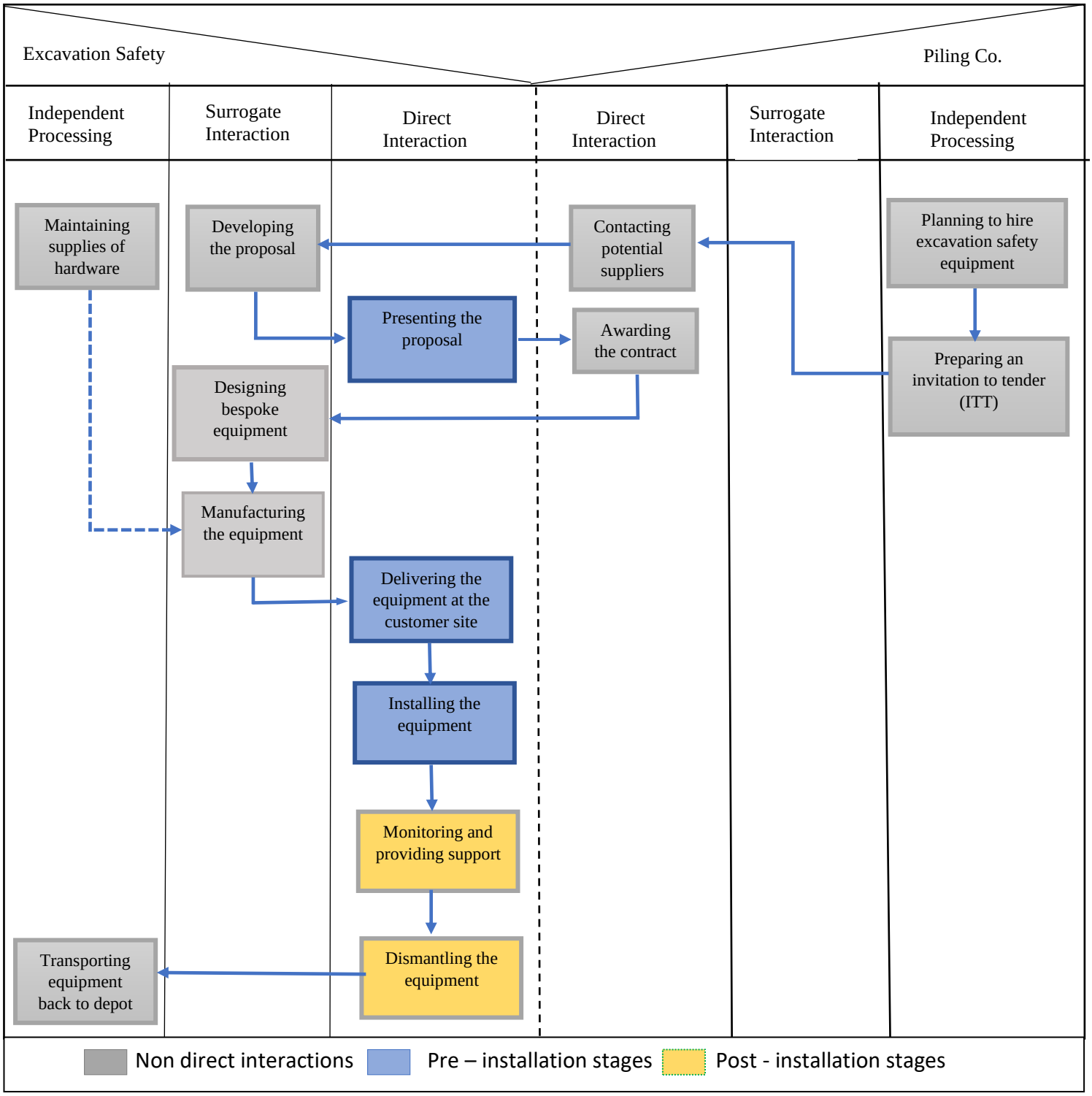

Figure 5.4: PCN diagram for service delivery process in Excavation Safety Co – Piling Co

Progressing from the manufacturing activities, there are four service activities provided by Excavation Safety Co which occur in the direct interaction regions. These service activities require direct contact with the customer as suggested by Wemmerlov (1990) and entail not only the presence of the customer at the site when the service is delivered but also the provision of significant inputs into the service process. The four activities as shown in the diagram include the process of delivering equipment to the site, installing it at the plant, providing support throughout the renting period and dismantling the part once the project is over. Active customer participation in assisting the service supplier is required for these activities. In the diagram two of these activities are in orange boxes, representing post – installation activities.

5.3.3.3 Result – oriented services (ROS)

5.3.3.3.1 Filtration Co - Citric Acid Co

The process of service delivery in this case starts when the customer sends an invitation to tender (ITT) document to Filtration Co for buying three units of filtration machine. When Filtration Co receive the ITT, the proposal preparation starts. As this does not involve direct interaction with the customer, it occurs in the surrogate region in the PCN Diagram of Figure 5.5. In the proposal preparation stage, the customer is asked to send a sample of their material (i.e. citric acid) to Filtration Co for running a test and to build a prototype machine, a smaller version of the filter machine. At this stage, Filtration Co does not know if they would win the tender as this part of the quotation and proposal serves only to convince the customer that they are capable to produce the bespoke filtration machine that meets the customer's requirement. Building the prototype involves direct interaction between customer and supplier to ensure both parties are agreed on the output that is

produced by the filter machine. Once Citric Acid Co is satisfied with the prototype, they agree to award the tender to Filtration Co to supply three units of filtration machine.

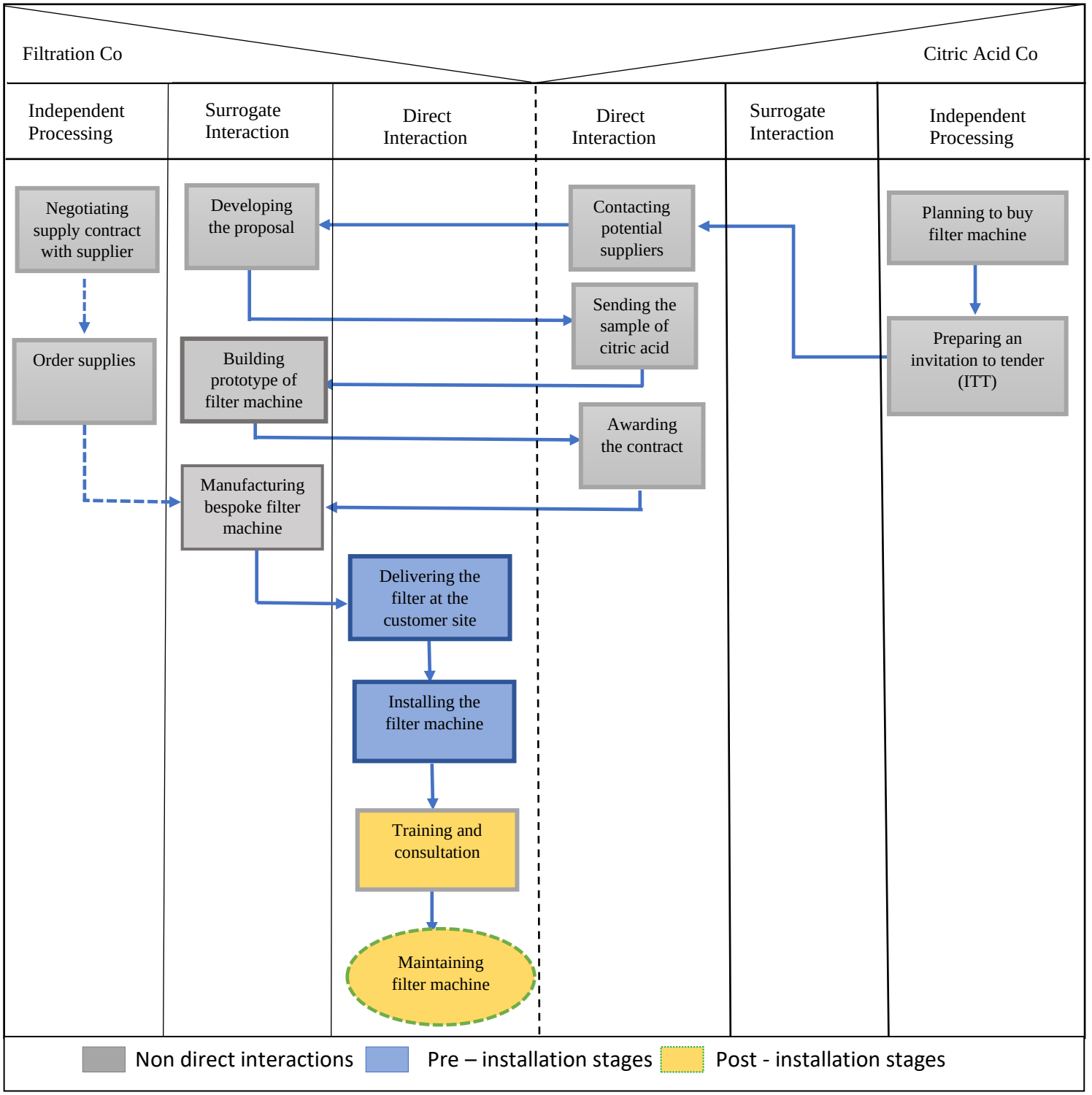

Figure 5.5: PCN diagram for the service delivery process of Filtration Co – Citric Acid Co

The next steps in the service process take place in the surrogate regions where Filtration Co begins the manufacture of the three units of the filtration machine based on the specifications given to them for the prototype. This part of the service process does not require the customer to be present physically or interact with the process because the service provider is manufacturing the machine based on the details for the prototype which acts as surrogate for the customer's presence. For the following four stages the customer's direct involvement is essential because these four service processes require active customer participation in the service process.

The first one is to deliver the filtration machine to the Citric Acid Co site in Belgium. As discussed, earlier, the customer has to support this by making sure wide access is granted and there is no obstruction. Direct interaction with the customer is also required for the installation of the filtration machine in their factory. After the installation the next stage is to train the customer in the workings of the machine and what they need to know and do to operate it as per standard operation procedure setup by the service provider.

Lastly, the round symbol with dashed lines is used in the diagram to show the repetitive service of maintaining the filtration machine to ensure the filter machine is in a good running condition. This is in the five years' service contract when the service provider is responsible for conducting periodical maintenance services on the filter machine. This stage involves direct interaction with the customer as they not only need to be present at the site during the service maintenance but also have to provide essential information during the diagnostic process, such as if they were experiencing any issue while operating the machine. This information is important for the service provider to keep the machine performing well.

5.3.3.3.2 Turbine Co – BU

As depicted in figure 5.6 (PCN diagram for service process of Turbine Co and BU), the service process chain begins in the independent processing region when the customer (BU) makes plans to buy a single unit of wind turbine for their organisation. This process occurs independently without the involvement of any suppliers when the committee of BU's Energy Department meet to make this decision.

In the next steps, communicating the invitation to tender (ITT) involves direct interaction with a few potential suppliers. Suppliers bid for the tender and some suppliers contacted BU to ask for further information and details about project specifications not in the ITT. The supplier, (Turbine Co) starts to prepare a quotation based on the ITT document which only involves surrogate interaction with the customer (i.e. using information and specifications) provided by BU in the ITT. After that, the next step is vital because it involves direct interaction with BU with the presentation of the proposal. BU evaluates the proposal, asking questions before they make the decision to choose the best supplier to supply the wind turbine for their organisation.

After the selection process, the tender is awarded to Turbine Co and this involves direct interaction between both organisations prior to signing the contract. The process then moves on and Turbine Co begins the process of designing the layout for grid connection from the wind turbine. During this stage it has to work closely with BU (as depicted in the direct interaction region in the PCN diagram) because they have limited knowledge about the power supply systems at BU's premises. BU must provide adequate information to the supplier at this stage for the design of the layout of the electrical connections from the wind turbine to their building of use.

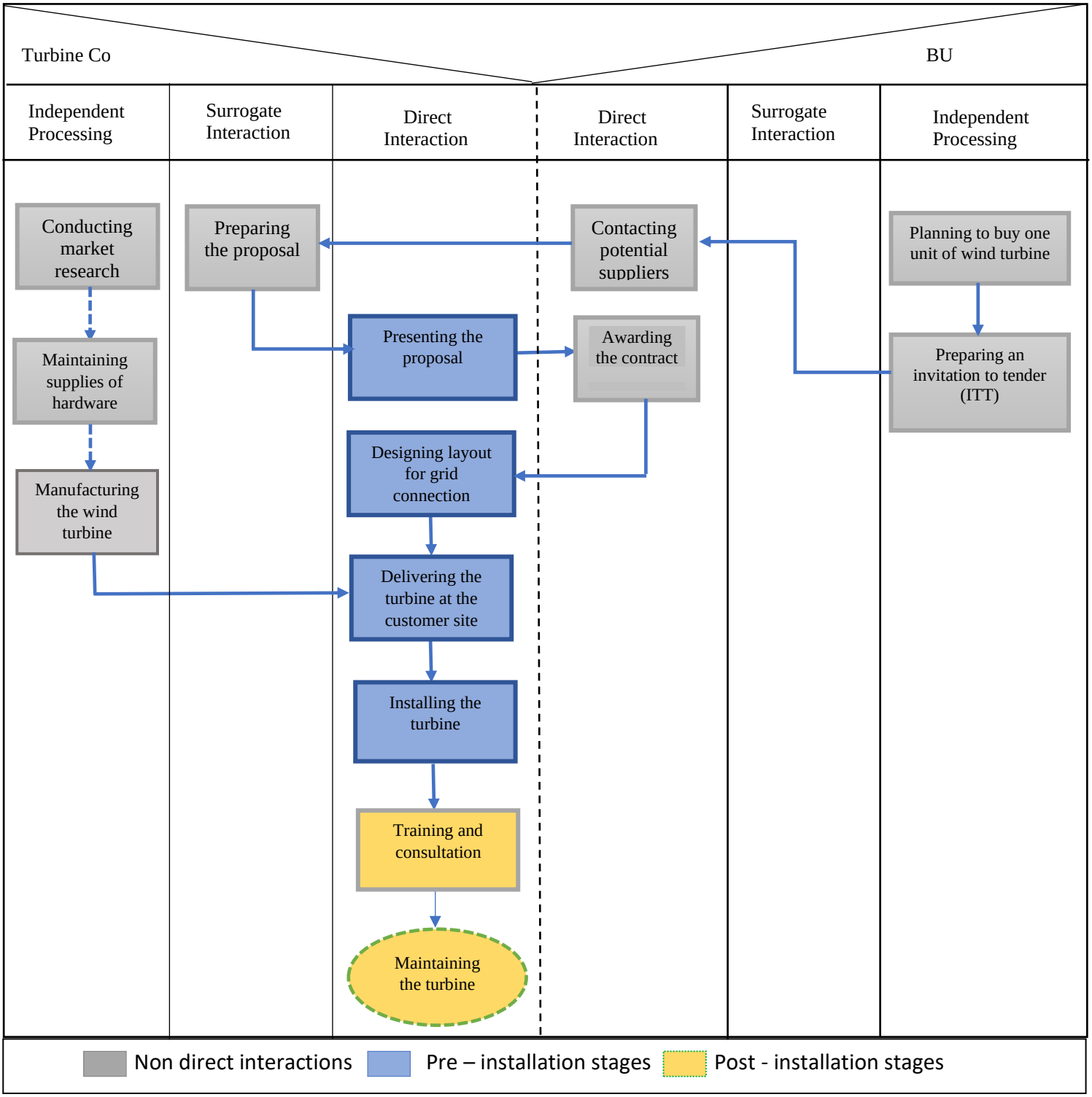

Figure 5.6: PCN diagram for service delivery process in Turbine Co - BU

Once both parties have agreed on the layout of the grid connection for the wind turbine, manufacturing activities take place in the independent processing regions of supplier. This is indicated in the diagram with the dashed lines to show these activities are not

dependent on any previous activities. The process of manufacturing can start earlier on as Turbine Co produces a range of standardized wind turbine.

The next four stages in the service process provided by Turbine Co require direct interaction with the customer. BU is needed to play their co-production roles significantly during this period as Turbine Co relies on them not only to be present at the site, but to provide important resources such as the crane hardstand, traffic control assistance, permits for vehicles and access to the site during these processes.

Once the wind turbine has been installed, the next step involves direct interaction between BU and Turbine Co who deliver training and consultation services to show BU the basic operations such as how the wind turbine works and what they should do to comply with the requirements of 'result-oriented package' provided by them. The last stage in the PCN diagram is the periodical service maintenance provided by Turbine Co. The yellow circle with the dashed lines shows this service is continuous for 25 years as stated in the service maintenance contract.

Chapter 6

Discussion

6.1 Introduction

This chapter discusses the findings of the study in relation to the extant servitization literature. In particular, it serves to synthesise the relevant literature in the field and the emerging findings from the case studies, highlighting their novel contributions to the existing body of knowledge.

6.2 Contractual governance in shaping customer's roles and responsibilities

In this section the answer to Research Question 1: "How does the contract shape the specifications of the customer's role and responsibilities in service delivery? " is discussed. Two related areas of inquiry are also considered in the light of the servitization literature. In so doing, the emerging findings are compared and contrasted with respect to the extant literature.

6.2.1 The impact of different types of servitization on contractual governance

As discussed in Chapter 2 (Section 2.2.2.2) scholars in servitization literature generally classify service offerings into three categories as highlighted by Tukker (2004): product–oriented, use–oriented and service-oriented. In the light of this categorization, the empirical findings from this study provide insights into how these different service offerings influence contractual governance in shaping the specifications of the customer roles and responsibilities. This section discusses the findings and analysis in Table 5.2 (chapter 5) in the context of servitization literature and focuses on the density or extensiveness of the contract

agreement in specifying customer roles. It is important to highlight that the measurement of density or extensiveness of the contract is quantified based on the number of contractual arrangements in terms of the length, number of paragraphs and number of clauses stipulated in the contract agreement pertaining to customer roles.

Firstly, in the category of product-oriented services in the case of Playground Co with two of their customers (Sea Life Co and Community Group), the analysis of the findings shows that the formal contract has allocated four clauses pertaining to customer's roles and responsibilities in service delivery. These four clauses specifically address the roles of the customers in the pre–installation stage. Secondly, in the category of use–oriented services the formal contract stipulated the customer roles in 10 clauses, three in the pre–installation phase and seven in the post–installation phase. Thirdly, in the category of result–oriented services, specifically in the case of Turbine Co – BU, the analysis of the contract shows 14 clauses with lengthy paragraphs in specifying customer roles and responsibilities during service delivery. Three of the clauses are focussed on the customer role pre–installation and 11 clauses at the post – installation phase.

The density spread of the contracts shows that the level of services offered and the complexity of the services impact on the contractual governance, more specifically on the contract design. This is contrary to Kreye et al, (2015) who suggested that service complexity did not impact on contractual governance. Moreover, insight from this study is in line with the notion of servitization where the level of services offered increases from product-oriented to use–oriented and service–oriented services (Tukker, 2004). Therefore, it is argued that the higher the level of service offered; the higher will be the level of interaction through

co–production activities with the customer. Therefore, more details in contractual governance are required to specify the customer roles and responsibilities.

In addition, the analysis of the findings also reveals three patterns of contract design when specifying customer roles and responsibilities in pre- and post-installation of service delivery. Firstly, in the first two cases representing product-oriented service, the allocation of the clauses in the formal contract that were used to specify the roles of the customer is only at the pre-installation phase. The logic behind this pattern is consistent with the nature of the service offered in this category. Tukker (2004) emphasised that the focus in this category is towards the sales and functionality of the product. Thus, the findings from the case studies (Playground Co with two of their customers: Sea Life Co and Community Group) have empirically confirmed that the formal contractual governance mechanism was used to strengthen the element of this service offered in this category. This is because the main value in product-oriented service is towards the sale of the product (playground equipment) even though some extra services may be added including preventive maintenance services as in the case of Sea Life Co. Therefore, the service provider using the contractual governance mechanism, allocated four clauses of customer roles to ensure the customer does what they are supposed to do during the installation process of the playground equipment. This is a crucial element during the service delivery phase to make sure the playground equipment can be installed successfully.

Secondly, in the case of use-oriented service (UOS), the findings from the case of Excavation Safety Co – Piling Co show that the roles and responsibilities of the customer were stipulated in the contract by three clauses in the pre-installation phase and seven clauses in the post–installation phase. The logic behind this distribution of clauses in contract design is

in line with the notion of servitization (Tukker, 2004; Oliva and Kallenberg, 2003) where the main focus in use-oriented services is on the use of the product and the service provider is responsible for the functioning of the product throughout the rental period. As the ownership of the product remains with the service provider, the contract is heavily weighted on clear stipulations on the roles and responsibilities of the customer to ensure the product is returned to the supplier in a good condition. The service provider uses the contract to safeguard against any damages to the product during the rental period.

Lastly, in the case of Filtration Co – Citric Acid, result–oriented services (ROS), there were no clauses in the formal contract mentioning the roles of the customer either in the pre- or post–installation phases. This will be discussed in the next section (Section 6.2.3) under lack of contractual capabilities of servitized manufacturer. Nonetheless, the case of Turbine Co with LU shows an interesting finding for the category of result–oriented service (ROS). The analysis reveals that the contract heavily specified the roles and responsibilities of the customer in the post-installation phase by 11 clauses to 3 clauses in the pre-installation phase. This pattern provides empirical evidence to support the arguments of Tukker(2004) for result-oriented services when contractual governance is heavily used in the post- installation phase because the service provider really needs the customer to do what they are supposed to do in order for them to be able to deliver the performance guarantee as promised in the contract. This is also in line with Ng et al., (2009) who suggested that the input from the customer has a significant influence on the performance of the service provider for providing result-oriented services.

Next, the emerging multiple contract functions in shaping customer roles are discussed in the light of the extant literature.

6.2.2 Contract functions in shaping customer roles

The functions of formal contracts in the servitization context are not well researched. Existing studies largely emphasise the role of formal contractual provision in performance based contracting context for example, in aligning contract structure with operations strategy (Datta and Roy, 2011) and measuring the impact on supplier performance (Zou et al., 2019). However, these studies offer limited insights into how multiple contract functions are used to shape the roles and responsibilities of the customer in the service delivery phase. Thus, this study advances our understanding by examining multiple functions of the contract in shaping customer roles in three different types of servitization context.

In product–oriented services, formal contract provisions have the two functions of safeguarding and coordination in the pre–installation phase of service delivery. The safeguarding function in the contract provision concerns project completion time, where the clauses in the contract clearly state that if there are any delays during the installation process due to the customer's lack of instruction (e.g. failure to allow access to the site), the service provider shall be entitled to charge a reasonable amount for any extra cost incurred as a result of the delay. In addition, the safeguarding function also features in the contract provision that if the service provider fails to comply with the estimated completion time, they would not be liable (should not be penalised). This is in line with the literature where the safeguarding function of the contract is protecting parties against potential opportunism and financial risks (Argyres and Mayer 2007). Later in the post–installation phase, the analysed contract provision shows the coordination function in aligning the service delivery process (i.e. periodical service maintenance) when it coordinates the co-production activities which require the customer to be present during the maintenance visits. This support the

coordination function discussed in the literature as it establishes formal routines for both parties (Argyres and Mayer 2007; Poppo and Zenger 2002).

In use–oriented services, an interesting insight from the case study was that the coordination function featured in the pre–installation phase of service delivery, rather than the safeguarding one as in the previous case. This is in line with the notion that the value of this service offering is the value derived from the use of the product (Tukker, 2004) and it is thus argued that the process of coordinating co–production activities is more crucial in this instance. The evidence from the case of Excavation Safety Co - Piling Co shows several clauses stipulated in the contract provision regarding coordination functions such as loading and unloading equipment at the site, guiding the driver or operator from Excavation Safety Co in assembling the equipment. It is argued that the service delivery process in this case will be hindered if the co–production activities with the customer are poorly coordinated. In addition, at the post–installation phase, where the customer returns the equipment to the service provider at the end of the renting period, the contract provision emphasis is on the safeguarding function. This is to protect Excavation Safety Co from buyer opportunism behaviour (Williamson 1985) by ensuring the buyer is responsible if there are any damages to the equipment.

Lastly, in the case of result–oriented services, a similar safeguarding function in the contract provision in the pre–installation phase is seen as in the product-oriented case. This is because, during this phase, the service provider is more concerned about protecting themselves from customer opportunistic behaviour which may lead to failure in installing the equipment. For example, the contract provision stipulated the customer's obligation to provide the crane hardstand during the process of installing the wind turbine and if there is

an accident due to failure to comply with its obligation, the delay and damage suffered by the Turbine Co shall be accounted for by the BU. This is in line with the literature where the safeguarding function is intended to protect the supplier against financial and operational uncertainties (Kern and Willcocks 2000; Williamson 1985). Later in the post–installation phase, the formal contract provision features more of the coordination function and this is again in line with the notion of result–oriented services (Tukker, 2004). In the ROS category, the interaction and co–production activities between service provider and customer is crucial particularly in the post–installation phase as they enable the service provider to deliver the "performance guarantee" as specified in the contract.

The next section discusses the lack of contracting capability in a servitized manufacturer.

6.2.3 Lack of contractual capability

The extant servitization literature has suggested that the adoption of the servitization strategy requires an organisation to acquire new capabilities that would enable it to compete in a new service orientation (Reinartz and Ulaga, 2008). One of the crucial capabilities that are related to the process of delivering servitized offering is contractual capabilities. Martinez et al., (2010) argues that unclear contract definitions on how service offerings will be delivered to the customer may lead to misunderstandings between provider and the customer.

The insight from the case of Filtration Co – Citric Acid Co confirms this argument in the literature, stressing the importance of being capable in designing contract structure in order to deliver the service effectively (Selviaridis and Spring, 2010; Van Der Valk and van Iwaarden, 2011; Martinez et al., 2010). The evidence from the case of Filtration Co and Citric Acid Co showed that the "grey area" in the final contract regarding the performance guarantee had

caused a misunderstanding between service provider and the customer. The in-depth analysis of the formal contract shows the surprising finding that there was no clause specifying the roles and responsibilities of the customer in the post-installation of service delivery process (i.e. the usage phase). It was revealed that the roles and responsibilities of the customer was discussed during the pre-installation phase (i.e. in the process of designing the machine and negotiating the contract) but failed to feature in the final contract. The problem arose when the individuals who operated the filtration machine misused the equipment by changing the feeding material of the machine. This shows that the misunderstanding had arisen because the people in the firm who negotiated the contract were different from those who used the equipment in the day to day operation of the equipment. This is in line with Datta and Roy (2011) who argue that there is a big knowledge gap between those individuals who negotiate the contract, referred to as the 'commercial customer' and the individuals who use the equipment, referred as the 'operational customer'. This then leads to the next area of interest for this research which was to understand the impact of multiple customers on contractual governance.

6.2.4 The impact of multiple customers on contractual governance

Before focusing on the impact of multiple customers on contractual governance, it is important to highlight that the empirical evidence in this study has expanded the definition of customer in the UST framework from the simple B2C setting to a larger and more complex B2B setting. In particular, it has enhanced our awareness that multiple customers are involved in the service delivery process for servitization. Moreover, this is an important insight as it is in line with the servitization literature that has urged manufacturers to identify and

understand the key stakeholders in the customer organisations in order for their needs to be fulfilled efficiently (Kowalkowski, 2011).

The literature has also suggested that one of the challenges for the servitization firm is to manage the variability of the inputs from different people within the customer's firm (e.g. Datta and Roy, 2011; Ng et al., 2009). As illustrated in the previous section regarding the lack of contractual capability in specifying customer's role and responsibilities, having multiple customers as key stakeholders can lead to confusion when delivering the service. To this end, the finding from the case of Filtration Co – Citric Acid Co has empirically confirmed what has been reported by Datta and Roy (2011) in their study: the individual from the customer's firm who negotiates the contract may have different views and understanding from the operational customer in the day to day operations of the machine.

As seen in the analysis of the process of identifying customers that are involved in providing input to the service process, different people may be involved at the different stages of process. This is in line with the literature which argues that the customers in a customer's organisation can play different roles such as buyers, payers or users (Michel et al., 2008; Sheth and Mittal, 2004). In addition, the findings of this study are also in line with Michel et al., (2008) who argued that the different roles of the customer could be performed by different individuals within the customer's organisation. Therefore, based on the empirical evidence, it is proposed that the formal contract provision should clearly specify the key stakeholders in the customer organisation and should clearly define their respective roles and responsibilities at the various stages. This is crucial for the manufacturers not only to define the customer's roles but also to understand the roles of the customer within a customer's organisation to fulfil the customer's needs accordingly (Raja et al., 2013). In addition, the

finding of this study also corroborates Raddats et al., (2017) in highlighting the co-production and interaction between customer and manufacturer in delivering the service offering in servitization. Thus, it is proposed that manufacturers and customers need to work collaboratively during the service delivery phase to enable satisfactory service offerings (Raddats et al., 2017).

6.3: Co – production in the service delivery

This part focuses on answering Research Question 2: How is service delivery in a servitization context co–produced with the customer after contract stipulation in the context of the servitization literature. Section 6.3.1 provides the discussion on the co–production process, Section 6.3.2 discusses customer co–production roles and Section 6.3.3 explains the implications of adopting the PCN diagram in a servitization setting. Lastly Section 6.4 provides the discussion on analytic generalization for this study.

6.3.1 Co – production process

Previous studies within the servitization context have still not fully looked at the topic of transformation from pure manufacturer towards servitization using co–production as the enabler (Bustinza et al., 2017). This study advances our understanding of this phenomenon by exploring the co–production process that is involved in the direct interaction between servitized manufacturer and the customers. In particular, this part of the discussion extends the insight provided in previous studies (e.g. Ruiz- Alba et al., 2019; Santamaría et al., 2012; Schaarschmidt et. al., 2017) which only looked at co–production as an enabler in the context of designing the service offering. Their studies refer to co–production (or co-creation as is used interchangeably in the literature) as the process of creative cooperation and interaction

between servitized manufacturer and customers at the designing stage of the service offering. This study, however, looks at co–production as an enabler in both the phases of designing and delivering the services to the customer.

The empirical evidence has shown that the process of co–production begins in the pre–installation stage where servitized manufacturer and customer are working together interdependently. For example, in all the cases, the process of designing the product involves input from the customer (i.e. in the form of information). The co – production at this stage is crucial to ensure that the servitized manufacturer is able to build the product and service offering according to the customer's needs. This is in line with the extant servitization literature which states that understanding customer needs is fundamental to the provision of servitized offerings (Tuli et al., 2007; Vargo and Lusch, 2004). Manufacturers must therefore understand their customers' requirements in order to effectively deliver their offerings (Kowalkowski, 2011).

Once the product and service offering have been designed and manufactured, the next phase of the co–production process is to deliver these offerings to the customer. The evidence has shown that in all the cases, allowing access to the sites is a pre-requisite of the co–production process as the service provider relies on the customer to deliver and install the product at the site. If access to the site is impeded, the process of delivering the services to the customer will be hindered. In the case of use-oriented and result-oriented services, the co-production process is more than just allowing access to the site; the customer is required to work together with the service supplier in assisting the process of service delivery. This is supported by Sampson (2012) who argues that the process of co–production may take place when the customer interacts with the supplier in providing input that is essential for the

service process and by directly participating in the actual execution of the service process. For example, in the case of Excavation Safety Co – Piling Co, the customer has to assist the employees from Excavation Safety Co in assembling the fabricated safety frame at the site because they have more knowledge about the construction site than the supplier. Similarly, in the case of Turbine Co – BU, the customer has to be present at the site to provide the crane hardstand and other related equipment during the process of installing the wind turbine. These co–production activities are vital to ensure the service offering can be delivered successfully. This is in line with Kowalkowski et al. (2012) who argue that servitization strategies can only be successful if companies engage in co – production during both the designing and the delivering service offering phases.

6.3.2 Customer co-production roles

In the servitization context where the manufacturer's strategies are to prolong the relationship by providing servitized offerings (i.e. service maintenance contracts), significant inputs from the customer are required whether they be customer's self, tangible belongings or information (Sampson, 2012). All the case studies have shown that in both the phases of pre- and post- installation, the process of service execution relies on the customer input.

The empirical finding from this study has enhanced our understanding of how customers play their roles in providing the input into the service process. The findings show that in the B2B context, specifically in servitization setting, the roles of the customer in providing the input is more complex than what have been illustrated in the B2C context in the extant literature (e.g. Sampson, 2012). This is because the customer does not just hand over the input to the service provider like a customer bringing his clothes to the laundry shop, but more active participation during the process of service delivery is required. In the first

category of customer input (i.e. customer's self), the findings show that customers play this role by allowing access to the site and by being present when service maintenance is taking place. Contrasted with the B2C setting where the customer is present to receive the service execution process on themselves (e.g. getting a haircut or teeth scaling), the case study provides evidence that in a B2B setting, the customer being present and allowing access facilitates the process of service delivery.

In the second category of customer's input (i.e. tangible belongings) the evidence shows different ways in which customers play their roles in different servitization settings as compared to what has been shown in B2C setting in the literature. In product-oriented services, as the ownership of the product is transferred at the moment the customer pays, the customer plays a role in providing tangible belongings (i.e. playground equipment) by allowing access to the site during a service maintenance visit. In the category of use–oriented services, the customer does not hold the ownership of the product (e.g. tangible belongings), thus the co–production role in this case is providing information regarding the production site so that the service delivery process can be executed. In the case of result–oriented services, the empirical findings have extended the Tukker (2004) typology by providing empirical evidence that the ownership of the product is actually transferred at the moment customer pays for the product. But the service provider offers performance-based service contract in the service maintenance period. Thus, it shows that customer's co–production role in providing their tangibles belongings is through providing access to the site so that service provider can conduct routine inspections on their product (i.e. wind turbine or filtration machine).

In the third category the customer roles in providing input is through giving necessary information that is essential for the execution of the service process. The finding has shown that customer co–production roles in providing information take place in the two stages of designing the product and service offering, and during the process of installing the product and service maintenance on the product. This is in line with the servitization literature (Ruiz-Alba et al., 2019; Kowalkowski, 2012) that argue that customer input, specifically information in the two phases of designing and delivering service offerings is of paramount importance for effective provision of servitization.

6.3.3 Implication of adapting PCN diagram in servitization setting

The application of the Process Chain Network (PCN) diagram for visualising the service delivery process involving co–production activities between manufacturer and customer reveals a new insight to the servitization literature. As illustrated in Section 5.3.3 (in chapter 5), the PCN diagram seems to suggest that the transition from pure manufacturing firm towards servitization involves a shift in the process domain. As suggested by Sampson (2012), process domain is the set of activities or processes that are initiated, led and performed by the process entity, (i.e. manufacturer or the customer).

In the pure manufacturing setting, the process domain of manufacturing firms is largely in the independent processing region in the PCN diagram, where less interaction with the customer is needed. However, as they shift to offer servitized offerings, more interaction with customers is needed and this creates more activities in the direct interaction region (Sampson, 2012). This is explained by the empirical evidence from the case studies which show there are six main co–production activities that involve direct interaction between service provider and the customers. These activities include designing the servitized offering,

presenting the proposal, delivering and installing the product, maintaining and providing training and support. These activities are referred to as “super service” by Campbell et al., (2011).These activities previously performed by the customer, shifted to be performed by the service provider in a servitization setting. This is in line with the notion of servitization as being a transition from ‘transactional to relationship’ (Oliva and Kallenberg ,2003). This is the first known study that visualises the service delivery process in servitization using the PCN diagram.

Furthermore, the application of the PCN diagram in visualising the service delivery process in servitization has enhanced our understanding of the notion of co–production by clearly illustrating what and where (in the service delivery stage) the co–production activities are needed for direct interaction between service provider and customer. Therefore, it is argued that this would be insightful information for both parties in designing more effective formal contract documents. As highlighted above, there are six important service elements throughout the service delivery stage that require significant customer input (whether it be in the form of customer’s self, tangible belongings or information). Therefore, it is important that formal contractual governance emphasises the defining of the roles and responsibilities of the customer in these elements of service.

In addition, the application of the PCN diagram for a service delivery activity in a servitization context has extended this tool by adding a new feature into the PCN diagram. The PCN diagram in the literature has been previously used in a simple B2C context involving short term and one-off activities throughout the process service chain such as when a customer places an order for a pizza (Sampson, 2012). However, its application in the servitization context in analysing the case studies reveals that there are service maintenance

activities that require continuous and repetitive interactions between service provider and the customer. These direct interaction activities need both parties to work interdependently for longer lengths of time, depending on the service maintenance offered by the service provider. For example, in the case of Turbine Co – BU, it involved the repetitive cycle of maintenance activities for 25 years. Theoretically, this new feature of the PCN diagram adds knowledge that helps both parties to improve efficiency in delivering the services, as it offers the opportunity to learn and accumulate experiences. It will also potentially help in developing trust and relational norms between the parties (Mayer and Argyres, 2004).

Moreover, the application of the PCN diagram for visualising the service delivery process in a more complex B2B context, particularly in a servitization setting, has enhanced our understanding of the interaction and co-production between customer and service provider. In Sampson's (2012) original PCN diagram the service provider in the B2C context was said to reduce the interaction with the customer by creating less activities in the direct interaction region to achieve more efficiency in productivity. In this study the application of the PCN in B2B context is expanded, particularly in servitization settings, by proposing that defining the roles and responsibilities of customers in a more precise way will be of paramount importance, especially for activities in the direct interaction region. This is because it might be the case that a high level of interaction with the customer is a prerequisite for some service delivery activities. The benefits of using the PCN diagram in this study context is that it serves as a tool to help the manufacturer and customer achieve a better understanding of each other's respective roles in the service delivery process and thus provide insightful input for an effective contract design. More specifically, it is suggested that the key element in the service delivery process involving direct interaction with the customer should be clearly stipulated in the contract document.

6.4 Analytic generalization for this study

As mentioned in chapter 3 (Methodology), this study aims for analytic generalization. This section briefly discusses the process of analytic generalisation (also referred to as theory generalization) according to Yin (2010). Yin (2010) suggested that analytic generalization involves a two-step process, of which the first is a conceptual claim by the researcher to show how the case study findings have a bearing on a particular theory. This first step was achieved in Chapter Two (Literature Review) and Chapter Five (Data Analysis).The literature review process shows how the theory of UST (customer involvement in the service process) had been used as a theoretical lens to investigate the customer and supplier interaction.

The second step is to apply the same theory to another situation. This was achieved in this study when the UST was applied in a more complex B2B context, specifically in a servitization setting. Yin (2010) has further suggested that the findings of the study should demonstrate how the theory or argument either challenged or supported the results. He argued that in the case of the findings supporting the theory, a logical and sound argument needs to be made by researchers to show how these findings can be generalised to similar situations. In this study, the empirical findings show that they support the theoretical argument of UST which is that the customer provides significant inputs in the service delivery phase in a servitization setting. The findings have shown clearly that if customers do not play their roles and responsibilities as they are supposed to, the execution of the service process would be hindered. This is linked to the research contribution of Research Question 2 which will be discussed in the next chapter. The finding of this study can therefore be generalised to a similar situation in a servitization context provided the nature of the interaction between

customer and supplier is similar (e.g.: service delivery process that requires the direct interaction of both parties).

Chapter 7

Conclusion

7.1 Introduction

This chapter endeavours to summarize the various conclusions that were reached in this study. Section 7.2 discusses the research contributions of this study. It is followed by the discussion of the transferability of this research by providing the implications for practice in section 7.3. Lastly, the limitations of the study and research avenues for future studies are identified in section 7. 4.

7.2 Research contribution

This study was set up to empirically investigate two main issues as stated in the two formulated Research Questions: 1. How does the contract shape the specifications of the customer's role and responsibilities in service delivery?; and 2. How is service delivery in a servitization context co-produced with the customer after contract stipulation?. These two research questions were identified in the light of the reviewed literature.

In the broadest terms, this research contributes to the literature by providing a more nuanced understanding of how contractual governance works to shape customer roles and responsibilities in three different types of servitization. It also contributes by detailing empirically how the process of co–production in service delivery takes place in the servitization context after the contract stipulation. In particular, the analyses of the findings in relation to the literature are identified below with the contributions in relation to each research question.

Contributions relating to Research Question 1

The analyses of the findings in relation to the extant literature identified five main contributions which are:

i. Reversing the logic of Kreye et al, (2015) who suggested that service complexity did not impact on contractual governance, this study has found that the level of services offered, and the complexity of the services did have an impact on the contractual governance, more specifically in the contract design. The analysis of the density or extensiveness of the contract (i.e. the number of the clauses, more detailed paragraphs in the formal contract provision), showed it was affected by the level of service offered and service complexity in the three different types of servitization in the contract designs. As the service level increased from product-oriented to use–oriented to result-oriented, more clauses and details and paragraphs were stipulated in the contract regarding the customer's roles and responsibilities. This is in line with the notion of moving towards servitization (i.e. Tukker, 2004, Oliva and Kallenberg, 2003) that as the manufacturing firm moves from product–oriented to use–oriented and result –oriented service, the level of service offered in their servitized offering also increases. Therefore, I argue and propose that the higher lev[i]el the service offered and the higher complexity of services, the higher the level of interaction through co–production activities with customer becomes, and therefore more detailed contractual governance is required to specify customer roles and responsibilities.
ii. The empirical findings from this study regarding the contract design in the pre- and post-installation phases provide the theoretical arguments to support the logic behind Tukker's (2004) typology of servitization. It was found that contract design in product–

oriented services heavily stipulated customer's roles in the pre-installation stage. This is in line with Tukker (2004) who emphasised that the focus in this category is towards the sale and functionality of the product and thus it is important to stipulate the customer's roles in the pre–installation phase to ensure the product can be installed and is functioning as it supposed to. Similarly, in the other two categories (use–oriented and result–oriented), the arrangement of clauses in both the pre- and post-installation phases was in line with the nature of the servitized offering (Tukker, 2004). For example, in use-oriented services, where the focus is 'use of the product' and the ownership of the product is retained by the service provider, contract provision dedicated more clauses at the post–installation phase to ensure that the product is returned to the supplier in a good condition. Meanwhile, in result–oriented service, where the main focus is the pre-determined result, the contract provision was heavily weighted on clear stipulations of the roles and responsibilities of the customer in the post–installation phase to ensure the customer does what they are supposed to do to enable the service provider to deliver the performance guarantee as promised.

iii. This study unpacks the multiple functions of the contracts (i.e. safeguarding and coordination) in shaping the customer's roles and responsibilities in service delivery. Extending the insight from previous studies (e.g. Datta and Roy, 2011; Zou et al., 2019) which only explored the functions of the contract in aligning service operation and supplier performance, this study empirically demonstrates how specific clauses in formal contract provision play safeguarding and coordination functions in shaping customer roles in service delivery in the servitization context. Furthermore, the findings also corroborate Datta and Roy (2011) by proposing that there is a big gap between the

'commercial customer' who negotiates the contract and the 'operational customer' who uses the product in day to day operations.

Contributions relating to Research Question 2

The findings relating to Research Question 2 has extended servitization literature by providing empirical evidence on co–production as an enabler for the transition from pure manufacturing firms to servitization. These are detailed below.

i. Extending previous studies in the literature (e.g. Ruiz-Alba et al., 2019; Santamaría et al., 2012; Schaarschmidt et. al., 2017) that focussed only on co–production in the phase of designing servitized offering, this study provides insight into how co-production activities take place in both the phases of designing and delivering servitized offerings after contract stipulation. The findings show the inter-dependent relationship between service provider and the customer in delivering 'super service' elements (Campbell et al. 2011). The findings also highlight the importance of co–production activities in delivering the servitized offering, which is in line with the literature that suggested that the implementation of servitization strategy can only be successful if the manufacturer engages in co–production with the customer (Kowalkowski et al. 2012).

ii. The empirical findings have enhanced our understanding of the customer's roles in the servitization context in several ways. Apart from extending the application of UST and the PCN diagram in the B2B context, they also provide a tool to help manufacturer and customer design a more effective contract provision by visualising the important activities involved in service delivery in a more transparent way. Furthermore, they

also reveal a new feature in the PCN diagram by showing repetitive and continuous interaction between the customer and service provider in the servitization context.

7.3 Implications for Practice

This research showed how contractual governance is used to shape specifications of customer roles and responsibilities in the service delivery. It also reveals how service delivery is co–produced with the customer in the servitization context. The results of the analyses of the case studies provide further insights that could be relevant to servitized manufacturers to consider.

1. The primary insight that is revealed by this study is that the customer's co– production roles are significant during the service delivery process. Thus, the managers need to carefully specify the customer's roles and responsibilities through the formal contract provision. It is important for the manager to stipulate the roles and responsibilities of the customer in great detail using contractual governance to shape the customer's roles and responsibilities.

2. Depending on the level of service offered, managers need to be aware of what and where (in the service delivery stage) co–production activities with the customer are needed. This is important because knowing what service activities require more interaction and co–production with the customer would mean that the contract design emphasises customer's roles in these activities.

3. This study provides an example in the case when conflict arose due to having multiple customers. Care should therefore be taken specifically in contract negotiation and at

the operational level to ensure clarity of communication. The manager needs to ensure that the important elements discussed in the contract negotiation are stipulated in the final contract. In addition, the manager must clearly identify the key stakeholders in the customer's organisation so that their roles and responsibilities can be specified in the contract accordingly.

7.4 Limitations of the study and future research avenue

Like most other research, this study has limitations that should be mentioned. While multiple case studies were employed as a research strategy to collect the data, the companies selected were limited to those using low-level technology in their industry. Therefore, the findings should not be generalized to the wider perspective of servitization companies using different levels of technology as the higher level of technology may affect the ways customer and supplier perform their co–production roles. Further empirical investigation is suggested to explore a wider perspective of the respective roles of customer and supplier in more advanced technology cases.

In addition, this study is heavily reliant on retrospective data, particularly the contracting data and some details in the service delivery data. Hence, future research is suggested to examine the process of contracting and how it influences the roles of customer and supplier in service delivery phase using a longitudinal case study approach. This would potentially offer richer data when capturing the process from the point of contracting to the point of service delivery.

Finally, this study is dependent mainly on data derived from the supplier's side collected through face to face interactions and semi structured interviews. Only in one case, Turbine Co – LU, was it possible to collect the data by interviewing both parties as the other

four cases had access restrictions to their customers. Even though data from the customers were collected through email threads, it would be useful for future research to collect the data by interviewing both parties.

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APPENDICES

Appendix A : Introduction letter

Lancaster University

(This letter will be sent to potential companies as the first phase in negotiating the access. Once they have agree to participate, then the consent form and PIS will be forwarded)

Dear Mr/ Mrs X
Job title & Company name.

How significant is your role as suppliers in delivering good services to your customers?

1. Why is this research important?

- Manufacturing firms can no longer rely on well-designed products as their only source of competitive advantage. Consequently, manufacturing firms have begun to shift their attention towards adding value to their core products by adding services that extend their core offering. In order to provide such services, manufacturing firms have to confront the added challenges of developing and sustaining long-term relationships with their customers, which requires them to learn new skills to interact with their customers as they integrate services.

2. What is the focus of this research?

- This research will explore the roles and practices that need to be played by suppliers when combining services with manufactured products and how these roles shape the relationships between suppliers and their customers.

3. What are the benefits to you of participating?

- This project will provide you a better understanding of your significant roles in building long-term relationships with your customers when you are providing them with integrated services.
- This project will involve a small numbers of manufacturing firms from different industries. This knowledge could provide you with additional insights into current practices taking place outside your industry, but that could potentially be applied within your own.
- In return for your co-operation and participation in this project, you will be provided with a research report specific to your company. Moreover, I would be willing to give a presentation to your colleagues to clarify the outcomes of this project if you wish.
- By participating in this project you will be contributing to new scholarly knowledge that can be used by not only academics and but also practitioners within the manufacturing industry.

Lancaster University

3. What would your contribution be?

- This project will be conducted via an interview. I will only require an hour of your time and the interview will be either conducted through a video call (skype) or face to face (in person). The method is entirely up to you.
- Tentatively, this project is scheduled to take place between February to November 2017. However, I am willing to engage with you at any time that would be convenient for you.

4. Who am I?

- I am a doctoral student within the Management Science department of Lancaster University, and this research project is being developed with the support of academic researchers at the University. I have five years of research and teaching experience within the operations management sector.
- My research project has been reviewed and approved by Faculty of Arts and Social Sciences and Lancaster University Management School's Research Ethics Committee to ensure that it complies with the code of confidentiality and data protection regulations.

5. What's next?

- I would be happy to talk with you and/or meet with you in person regarding this project, and I would also be willing to provide any further information, and clarify the nature of this study before you agree to participate.

6. How can I been contacted?

- Kasmaruddin Che Hussin (Doctoral Researcher)
  Tel: +44(0) 07589700714 / k.chehussin@lancaster.ac.uk

Thank you for your time.

Appendix B : Consent form

Lancaster University

CONSENT FORM

Project Title: The roles and practices of buyers and suppliers when combining services with manufactured products
Name of Researchers: Kasmaruddin Che Hussin
Email: k.chehussin@lancaster.ac.uk

Please tick each box

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time during my participation in this study and within two weeks after I took part in the study, without giving any reason. If I withdraw within two weeks of taking part in the study my data will be removed. ☐
3. I understand that any information given by me may be used in future reports, academic articles, publications or presentations by the researcher/s, but my personal information will not be included and I will not be identifiable. ☐
4. I understand that my name/my organisation's name will not appear in any reports, articles or presentation without my consent. ☐
5. I understand that any interviews will be audio-recorded and transcribed and that data will be protected on encrypted devices and kept secure. ☐
6. I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study. ☐
7. I agree to take part in the above study. ☐

Name of Participant _____ Date _____ Signature _____

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Signature of Researcher /person taking the consent _____ **Date** _____ Day/month/year

One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University

Appendix C: Case study question

A. Company background

- Interviewee details (name, job title, department, job description, years with the company)
- Company information (year of establishment, core business activities, key customers, product and services offered, organisational structure)

B. Customer

- Choose one or two customers to focus on : in past or on-going project
- Background of the customer (business transaction history, size of company)
- Product and services offered to the customer

C. Contracting process

- Overview and phases of the process – (i.e. receiving ITT, contacted by customer)
- Process of developing the proposal or quotation
- Process of presentation of the proposal
- Process of writing the contract
- Process of negotiating the contract (price, length of the service, customise product)
- Process of stipulating the role and responsibilities of the customer
- Process of awarding the tender

D. Service delivery process

- Overview and phases of service delivery
- Pre-installation: site visit, designing, manufacturing
- Post-installation: training, consultation , periodic service maintenance

E. Co-production activities

- Customer role and responsibilities during front-end, middle and back-end of service delivery phase
- Resources or input that customer need to provide

F. Final question

- Relevant organisation documents
- Arranging for the next meeting
- Suggestion for other personnel in the organisation to interviewed