

**Value Creation and the Implementation of Technologies
for Advancing Services: An Investigation in the UK B2B
Retail Sector**

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***The thesis is submitted in partial fulfilment of the requirements for the award of the
degree of Doctor of Philosophy in the University of Portsmouth***

DECLARATION

Whilst registered as a candidate for the degree of PhD at the Portsmouth Business School; I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.

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DISSEMINATION

This research has resulted in numerous publications, abstracts and presentations. As a result, four articles have been developed, which are under review in peer-reviewed journals. Through presenting different stages of this research in different conferences and academic institutions, this study has established a clear potential for future publications. A summary of the papers, presentations and awards is mentioned below:

→ **From momentum to movement: releasing the value creation potentials of technologies for advancing services.** Under review in the *Journal of the Academy of Marketing Science*.

→ **Technology evaluation in new service development: a typology of delivering value in the UK food retailing.** Revised and resubmitted, 3rd round of review in the *Technological Forecasting & Social change*.

→ **Top reasons you're my best friend: capturing the role of technology in service architectures.** Revised and resubmit, in the *Marketing Theory*.

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- - *CINet* 17th International Conference, “Business model innovation through continuous service innovation”, 2016.

- - *CBIM* Annual Conference, “Profiting from technologies in a service-led context - A study of the UK retail industry”, 2016.

- - Cambridge Service Week, Creating Value Through Customer Services by Making the Shift to Services, University of Cambridge, 2015.

ABSTRACT

It is widely recognized that the use of technologies can serve as a critical strategic tool in benefiting from innovation and achieving increased business profitability in the retail sector. Research addressing the role of technologies in the theoretical entity of profiting from technological innovation (PFI) has proliferated in recent years. In parallel, the growing role of technologies within the theory of service-dominant logic (SDL) is thriving. However, firms face the difficult task of applying technologies and releasing the value creation potentials of technologies for advancing services. In this sense, the retail industry has been a recognized context for practices of technologies for innovating services. This research explores the role of technology and its value drivers for innovating services in the UK retail sector.

While the fit between the PFI and SDL frameworks has been overlooked, insight into the importance of technology within this theoretical interface remains unexplored. This research focuses on the implementation stage of the adoption process of technologies. In this stage, retailers identify new technologies, through collaboration with technology suppliers and engage in assessing and operational aspects. In doing so, retailers are increasingly moving towards technologies aimed at innovating their services through improving efficiency and productivity. The research is followed by two phases of data collection. Phase one includes semi-structured qualitative interviews with key informants from the technology suppliers in the UK retail sector. Phase two includes an exploratory stage with nine case studies in the UK retail sector.

Conclusively, this research, first, offers a revised perspective for Teece's works in 1986 and 2006 on how to profit from technological innovation (PFI). Second, it develops an integrative framework through linking the revised-PFI framework with the theoretical foundations of service-dominant logic (SDL). Third, it provides a roadmap for the implementation model of technologies in the UK retail sector. Fourth, it offers a typology of technology spectrum for delivering value by different technologies during the implementation process. The typology consists of nine unique types of technologies in the chosen sector. Fifth, it updates the typology of technology spectrum and presents it in the form of a typology of retail business models, where each group of technologies requires an exclusive business model for the retailer to be adopted.

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ABBREVIATIONS

B2B	Business to Business
B2C	Business to Consumer
BM	Business Model
CAGR	Compound Annual Growth Rate
ERP	Enterprise Resource Planning
FMCG	Fast Moving Consumer Good
IP	Intellectual Property
KI	Key Informant
LA	Lab Accelerator
NPD	New Product Development
NSD	New Service Development
PAP	Product Assortment Planning
PFI	Profiting from Technological Innovation
POS	Point of Sale
R&D	Research and Development
RBM	Retail Business Model
RFI	Request for Information
RFP	Request for Proposal
ROI	Return on Investment
RQ	Research Question
SDL	Service Dominant Logic
SI	Service Innovation
SME	Small and Medium Sized Enterprise
UK	United Kingdom
US	United States of America
VA	Value Appropriation
VC	Value Creation
VCC	Value Co-Creation

CHAPTER 1 INTRODUCTION

1.1 RESEARCH BACKGROUND

Advances in technology are leading to a proliferation of new service offerings while changing how multiple members in a service environment accommodate and interact with each other. The diversity of the service sectors suggests that differences exist not only for the development of various new services but also between how different technologies bring competitive advantage and improve services (Ostrom et al. 2015; Zomerdijk and Voss 2011). In this sense, the retail industry has been a recognized context for practices of technologies within the service domain. Top performing retailers recognize that the delivery of new and advanced services requires their business models to be adaptive and responsive rather than predictive (Pelser et al. 2015; Sorescu et al. 2011).

Meanwhile the variety of the services that retailers offer needs to address the challenges around their operations and activities that support their core business capabilities (Pauwels and Weiss 2008; Weijters et al. 2007). Retailers are increasingly moving towards technologies aiming at improving efficiency and productivity while cutting costs (Raconteur 2016). As a result, technology companies large and small are offering retailers a staggering array of new technologies, from smart payment systems to in-store scanning systems for use by consumers via their smartphones (Herhausen et al. 2015; Westjohn et al. 2009). At the same time, they have been facing fundamental levels of change in the past few years. These include discounters trying to increase market share by cutting the price; growing level of competition from multichannel retailing; and high pressure to

become responsive and adapt to changes using technologies as an enabler (Euromonitor International 2015; Raconteur 2017a). Some have successfully managed multichannel strategies through the introduction of online and convenience stores (Mahar et al. 2014; Pelser et al. 2015), while others have tried to innovate new services through offering new technologies and improving customer experience (Evanschitzky et al. 2015; Vize et al. 2013).

The adoption of new technologies provides retailers with the opportunity to improve their operations and offer new services so long as they can understand customer needs and enhance customer satisfaction (Ngo and O’Cass 2013; Puccinelli et al. 2009). This incorporation not only improves service levels but also lowers labour operational costs (Evanschitzky et al. 2015; Wieland et al. 2017). However, the use of technologies, which are aimed to deliver value for activities, are complicated and unpredictable. The success of new services through the application of technologies highly depends on a firm’s assessment processes and willingness to adopt the technologies widely (Biemans et al. 2016; Storey et al. 2016). Relative to B2C (business to consumer) practices, industrial and B2B practices operate in a culture driven by technology rather than marketing (Lilien 2016; Vargo and Lusch 2011).

The growing importance of advancing technologies and their impact on services is highlighted as a cross-cutting research priority that has the potential to impact multiple dimensions of service (Barrett et al. 2015; Snyder et al. 2016). In studies by Ostrom et al. (2010, 2015) involving researchers associated with service research centres around the world, they have also underlined the importance of technology on services. Further, top journals have dedicated special issues to this matter, including the *Journal of the Academy*

of Marketing Science (2016), *Journal of Business Research* (2011), *Journal of Service Research* (2016), and *Journal of Product Innovation Management* (2017). The connection between cutting-edge technologies, a network of activities and service innovation practices results in sustainable benefits, competitive advantage and innovative contribution to the firm (Storey et al. 2016; Wooder et al. 2012). It also influences the distribution of return among key members and value offering from firm's capabilities (Bettencourt et al. 2014a; Dotzel et al. 2013).

Service innovation can be defined as a new process or service offering that is put into practice by an organization, and is adopted by, and creates value for one or more actors in a service network (Snyder et al. 2016; Witell et al. 2016). Service innovation is often connected to new service development (e.g., Biemans et al. 2016; Menor et al. 2002; Storey et al. 2016). While new service development most frequently has its focus on the actual process of developing a new offering, service innovation focuses on the outcome of the process (Patrício et al. 2018). Further, building on a Schumpeterian approach, service innovation refers to a new service or the outcome of an improved service, which is put into practice and provides benefit for different actors involved with it (Witell et al. 2015, 2016). The benefit is derived from adding and delivering value for different actors (Ostrom et al. 2015). This definition highlights some interesting aspects of service innovation. First, the definition separates the outcome of service innovation from the process of development (e.g., Jaw et al. 2010). Second, for an invention to become an innovation, it must be used and put into practice (e.g., Zomerdijk and Voss 2011). Third, the invention must be new to one of the actors (e.g., Lusch and Nambisan 2015). Fourth, the invention must create value for some actor (Bettencourt et al. 2014a).

Frequently, service innovation and/or new service development have often been referred to a process and an outcome that has similar requirements as for when developing and innovating new products. However, within the increasingly complex digital economy, the steps of developing or innovating services are entirely different from those of products (Gallouj et al. 2015). In general, new service development differs from new product development because of the inherent characteristics of services (Biemans et al. 2016; Papastathopoulou and Hultink 2012). It is overall more profitable to engage with customers when developing services compared to products, and it is especially profitable to engage with them in the later and outcome-focused phases of new service development (Dotzel et al. 2013; Schleimer and Shulman 2011). The underlying logic is that the focus for service is on the experiential components, which in turn generate more value in use (Lusch and Nambisan 2015).

Finally, the interactions between service innovation and business model literature has led to the development of a new concept primarily designed for manufacturing firms, known as servitization. Service business model innovation is the product of a servitization strategy, where a manufacturing firm with a product business model expands its offering into services related to its products and, as a result, shifts from the “product-only” business model to the “service-oriented” model (Cusumano et al. 2015; Visnjic et al. 2016). Servitization has received growing attention within the innovation community over the recent years (Ostrom et al. 2010; Suarez et al. 2013). While often heralded as a move that creates value for the customer, servitization is necessary to create and capture value from product innovation primarily from a manufacturing perspective (Kastalli et al. 2013). To understand the importance of servitization, there is the need for research within a

manufacturing context considering the role of product innovation and the related service business model innovation accordingly. Therefore, while this research takes place within the service sector, exploring the concept of service business model innovation (servitization) considering a manufacturing perspective, will remain beyond the scope of this project in terms of theoretical and practical development.

1.2 RESEARCH GAP

To date, research within service marketing literature has emphasized the significant impact of technologies on different service domains (Ostrom et al. 2015; Wieland et al. 2017); the degree of market readiness for new technologies (Parasuraman 2000; Westjohn et al. 2009); and the vital presence of technologies in service provision for economic exchange (Vargo and Lusch 2004a, 2016, 2017). Also, innovation and/or strategy research has highlighted the role of technological sophistication for successful service innovation (Biemans and Langerak 2015; Storey et al. 2016); how to capture value from it (Dotzel et al. 2013; Jacobides et al. 2006); and how to obtain economic returns from innovative activities (Pisano and Teece 2007; Teece 2006, 2010a).

The service innovation literature has identified different elements affecting the use or adoption of new technologies, which are limited mainly to self-service technologies (Collier and Sherrell 2010; Evanschitzky et al. 2015; Zhu et al. 2013). These elements include customer engagement, customer value management or customer willingness to use the technology consistently in business to consumer context (Ngo and O’Cass 2009; van Doorn et al. 2010; Weijters et al. 2007). While the primary focus of prior research has been identifying factors affecting consumer use or adoption of new technologies

(Evanschitzky et al. 2015; Van Beuningen et al. 2009; Van Riel et al. 2004), the assessment processes and practices leading to the adoption or rejection of such technologies primarily in a retail context, are far less developed (Patel 2014; Vize et al. 2013). There also remains a knowledge gap on which further research on different practices of the diffusion of innovation in different service organizations should be focused (Greenhalgh et al. 2004; Venkatesh et al. 2017).

Furthermore, despite these contributions, essential research gaps remain on how the value creation potential of leveraging technologies can advance services; result in profiting from the core and supplementary resources, and lead to changes in firm's business model and service practices. While the application of technologies for advancing services lays its background on different areas of the business literature, there is a gap within service management literature about a theoretical (and further developed empirical advances) perspective that strains the role of technology and its impact on value through integrating key areas from which, the service domain has been derived. Also, there remains a need for the conceptual association of critical theoretical entities from different areas, which highlight the role of technologies, including "Service-Dominant Logic" (S-D logic) (Vargo and Lusch 2004a, 2008a, 2016, 2017) and how to benefit from technological innovations and available firm resources including "Profiting from Technological Innovation" (PFI) (Teece 1986, 2006, 2010a). Further, little remains known about different practices, in which these seminal theoretical works tie together (e.g., the connection between how to benefit from technologies in PFI and the concepts of creation and co-creation in S-D logic).

1.3 CHOICE OF RESEARCH CONTEXT

Recent technological developments are blurring the traditional boundaries of service provision while providing service firms with a diverse range of opportunities to develop and innovate services (Brynjolfsson et al. 2013). Different service sectors including retail, finance, health care and insurance are benefiting from technological advancements as the application of technologies is essential for successful multi-channel customer management and competitive advantage in long run (Ostrom et al. 2015; Sorescu et al. 2011) (see Table 1.1). Within the increasingly competitive retail sector, technology suppliers are offering a diverse array of technologies that can improve the provision of multiple actors and activities. However, it is particularly difficult for retailers to achieve an accurate single view through bricks-and-mortar stores, in which many customers purchase without providing any identifying information (e.g., they pay cash) and it is costly to match each store purchase to the customer database (Brynjolfsson et al. 2013; Grewal et al. 2017).

Different technologies have been introduced to the retail sector over the past two decades. However, many have failed to remain in the market for a long time particularly since retail is known as a context with a lower rate of diffusion and adoption of innovation compared to its counterpart industries (Racontour 2017a; Venkatesh et al. 2017). This highlights the need to explore the interactions and motives taking place among the key members, who are involved in the assessment of technologies (Brynjolfsson et al. 2013; Evanschitzky et al. 2015). The intense level of competition requires the retailer (as the focal firm) to have a clear understanding of its ongoing activities (i.e., suitable design and

development of business models); and dynamic capabilities (i.e., right use of resources for long-term competitive advantage) to properly adjust them with the technological changes in the market. The challenges and efforts entail the selection of a well-established industry, which involves the participation of different members and activities for short and long-term advantage. Therefore, the retail industry as a recognized sector with regards to the practices of technology for advancing services was chosen for the choice of the research context.

Meanwhile, the main focus of this research is on understanding the impacts of the application of technologies for innovating services, facilitating different operations, and achieving competitive advantage. Although careful consideration of the problem directs the unit of analysis of the research to be a retailer, understanding the joint practices and interactions that lead to the final adoption or rejection of technology calls for out-of-the-box thinking. That is, the key decision makers (i.e., the retailer and its upstream technology supplier) involved in the practices, which happen before the final adoption or rejection of technology, should be studied carefully. Exploring these practices within a particular retailer as the primary source of data collection provides case-specific results. However, studying the motives and interactions using multiple upstream technology suppliers enables the research to understand the problem by real-life data and develop insightful and practical implications. Gathering information and creating perspective in this manner, through employing the technology suppliers as the primary source of data, enables the project to achieve out-of-the-box thinking and discover the interactions deeply. The result is that a multidimensional viewpoint concerning a diverse range of practices and motives will be explored and developed. This will also improve the

generalizability of the frameworks and models developed in this research while offering a comprehensive view of the entire practices, motives, and interactions that happen before the final adoption or rejection of technology and to innovate services.

Table 1.1 provides a classification of different service sectors based on main innovation moderators. As evident in the classification, retail industry is the only service sector that provides distinctive opportunities involving different aspects of each innovation moderator. For instance, the degree of R&D in the retail sector involves both internal development and external partnership. Retailers also tend to focus on the process and the outcome of the new and improved services. Finally, while there is a clear focus on the adoption stage of technologies, retailers emphasize extensively on the processes happening prior to the final adoption or rejection of the technology as well.

Table 1.1 Classification of the service sector based on innovation moderators ¹

Type of service sector	Characteristics of the key innovation moderator		
	<i>Degree of R&D</i>	<i>Extent of advancing services (new service development vs. service innovation)</i>	<i>Management of implementation and adoption process</i>
<i>Finance and Banking</i>	Mainly business oriented with firms competing for first mover advantage by internal development	Based on tacit knowledge ² with extensive focus on the process of developing a new offering	Highly connected and overlapping as the implementation process only starts with the objective of adoption
<i>Healthcare and Insurance</i>	Business and customer oriented with firms competing for intellectual property	Based on tacit and explicit knowledge ³ with extensive focus on the outcome and without rich functionality as consumers demand	Widely focused on the adoption process due to increasingly embracing digital economy and ecosystems
<i>Retail and Distribution</i>	Business and customer oriented with firms benefiting from internal development and external partners to achieve competitive advantage	Based on tacit and explicit knowledge with extensive focus on both the process of developing and outcome of a new offering	Disintegrated with extensive focus on both implementation and adoption process of a diverse range of technologies beside high degree of implementation and low degree of adoption
<i>Tourism and Transport</i>	Customer oriented with increasing focus on outsourcing and involving external partners to cut the cost	Based on explicit knowledge with high focus on the outcome and delivering low cost service innovation	Low adopter sector, which is mainly focused on the long implementation process of a few technologies such as driverless cars with low rate of adoption

¹ Source: (Gallouj et al. 2015; Patrício et al. 2018; Raconteur 2017b, 2018b, 2018c, 2018d; Storey et al. 2016; Venkatesh et al. 2007)

² Tacit Knowledge is primarily delivered with the aid of technology.

³ Explicit knowledge is primarily delivered by interpersonal interactions.

1.4 RESEARCH CONTRIBUTIONS

To better explain the contributions of this project, the contributions are based on the categorization provided by MacInnis (2011) in the *Journal of Marketing*. The key contributions are as follows.

First, the research offers a revised perspective for Teece's seminal work in 1986 and further developed in 2006 on how appropriability regimes profit from innovation and gain competitive advantage known as "Profiting from Technological Innovation" (PFI). Teece (1986, 2006) propose that the emergence of a core technology sits in the centre of appropriability regimes, and if specialized, it is difficult for other firms to replicate while the competition shifts to service instead. The revised perspective in this research proposes the opposite direction, as in retail, although the assets and technologies are specialized, they are more likely to be duplicated by other actors. Unlike Teece, this project observes that the competition in a service ecosystem results in the application of complementary assets as technologies. These applications lead to changes in the distribution of return from service innovation and changes in the business model.

Second, the research develops an integrative framework, which links two fundamental principles together to better explain the value potential of technology application. A fundamental focus of this research is on understanding the role of technology in advancing services. In doing so, understanding the role of technology for services requires a clear establishment of the value network as well as integrating resources and different practices (Barrett et al. 2015; Dotzel et al. 2013; Lusch and Nambisan 2015). Therefore, the conceptual frameworks of this research integrate the revised-PFI framework with the

theoretical foundations known as dominant service logic (S-D logic) (Vargo and Lusch 2004a, 2008a, 2016, 2017). The integration enables the framework to view the creational and co-creational aspect of value by service offering properly. While the two theoretical foundations (S-D logic and PFI) have been well known and theorized, this research converts them into something new and finds a novel and simplified perspective on their interconnections (MacInnis 2011).

Third, the research delineates through providing a roadmap for the implementation of technologies in retail. The delineation enables the understanding of a roadmap or entity through explaining cause and effect relationships (MacInnis 2011; Van de Ven 2007). Roadmap studies are fundamental to gain a rich understanding of assessment processes, organizational adaptation, different operations, and innovation activities (Huber and Van de Ven 1990; Van de Ven and Polley 1992). While previous research has uncovered the importance of adopting new technologies, understanding the practices and processes before the adoption or rejection of technology remains unexplored (Rogers 2003; Venkatesh et al. 2012, 2017). As a result, this research explores the diverse practices, which happen between a retailer and a technology supplier in the UK retail sector. The practices include a series of activities and are parts of a process, which takes place before the final adoption or rejection of technology, known as the implementation process.

Fourth, the research provides a typology of technologies for delivering value as a unique way of building theory. This research argues that a typology of technology spectrum within the service domain in general and the retail sector, in particular, is, in fact, a strong theory for three reasons. The typology shows how different technologies fit into different cells implicitly. Therefore, the typology relates by differentiating and seeing different

pieces and dimensions (MacInnis 2011). It highlights the value creation potential of technology applications and first offers, then combines two sets of pieces for value creation known as value appropriation and value co-creation. The research justifies this typology using a diverse range of technologies in the UK retail sector. The scheme for the selection of technologies reduces irrelevant variation, and it clarifies the domain of findings as service (Eisenhardt 1989).

Fifth, as a result of seeing different pieces, the research delineates through explaining different entities in detail (MacInnis 2011). The typology of technology spectrum is further updated and presented in the form of a typology of retail business models. Through presenting nine ideal types, the typology of retail business models describes properly what the entity under study is (MacInnis and De Mello 2005). Each ideal type represents a unique type of business model for a retailer in the UK retail sector. Further, the typology shows that various groups of technologies require the retailer to adopt different types of business models accordingly. Therefore, this research will revise, integrate, differentiate and delineate.

1.5 RESEARCH AIM, OBJECTIVES, AND QUESTIONS

Technology is considered as the primary source for advancing services and achieving competitive advantage for the service firms in general and the retailers in particular. This project intends to develop an effective response to the challenges currently faced by the retailers in the UK retail sector. Therefore, the aim of the research is to understand the impacts of the application of technologies for innovating services in the chosen context. It is intended that the research finding will contribute to the development process model for

the implementation stage of technologies within the above context. The research project also aims to explore the impacts of the implementation of technologies on innovating services and facilitating activities through the development of business models for retailers. Therefore, these above aims raise the following objectives and research questions:

The key incentives for the development of the conceptual frameworks and the key contributions of this research are explained in detail in sections 1.1, 1.2, and 1.3. As mentioned before retailers in the UK industry are facing an increasing level of change while technology suppliers are offering the retailers a diverse range of technologies to use. This creates a need to understand the role of technology in advancing services for the retailers. Also, there remains the need to identify the role of technology in the retailer's value chain and consider the key value drivers of it. Furthermore, understanding how different technologies impact the retailer's practices and result in the adoption of different business models for the retailer is of fundamental importance. Thus, this study focuses on how technologies are implemented while understanding how different technologies deliver value in multiple forms in the context of the UK retail sector. In doing so, this research follows four key objectives and two critical research questions. While the objectives one and two are linked to the first research question, objectives three and four focus on answering the second research question of this research. As such, the objectives one and two of the research are as follows:

- **Research Objective 1:** To identify different processes and practices, which take place between the retailer and the technology supplier before the final adoption or rejection of the technology in the UK retail sector.

- **Research Objective 2:** To demonstrate the key features and benefits of the implementation process of technologies using case studies of different technologies, which have been implemented/are being implemented before the final adoption stage in the UK retail sector.

To achieve the above research objectives, this research plans to answer the first research question as:

⇒ **Research Question 1:** *What are the processes and practices for the implementation of technologies in the UK retail sector?*

After achieving a clear understanding of different processes and practices for the implementation of technologies, which take place before the final adoption or rejection of the technology, this study aims to explore the importance of technology considering its value drivers in the UK retail sector. Inspired by the research findings from understanding the processes and practices of implementing technologies, this thesis intends to identify and study the various types of technologies and their value drivers. The aim is to provide a classification of technologies in the UK retail sector in the form of a typology of the technology spectrum. Next, the typology is enriched and re-presented in the form of a typology of retail business models, which highlights different integrations of activities and resources by the retailers in the UK retail sector. Therefore, this thesis offers two research objectives to answer the second critical research question. As such, the objectives three and four of this research are as follows:

- **Research Objective 3:** To provide a classification of technologies in the UK retail sector, which highlights how different groups of technologies create value for advancing services in retail.
- **Research Objective 4:** To develop a typology of retail business models in the UK retail sector, which illustrates how different types of technologies require different types of business models to be created and developed depending on the retailer's capabilities and objectives.

To achieve the above research objectives, this research aims to answer the second research question as:

⇒ **Research Question 2:** *How do retailers create value for innovating services during the implementation process of technologies in the UK retail sector?*

1.6 OVERVIEW OF THE RESEARCH APPROACH AND SCOPE OF STUDY

This research aims to provide an in-depth understanding of the implementation process of technologies and their value drivers using qualitative interviews and case studies (Creswell 2013; Huber and Van de Ven 1990; Yin 2014). Process studies are centrally concerned with how change unfolds in the entities or things being studied (Van de Ven 2007). Through exploring the implementation process of technologies, the research aims to examine the research questions primarily dealing with how things change and develop over time. By exploiting differences in the kinds of knowledge that scholars and other stakeholders can bring forth on a problem, research can produce knowledge that is more penetrating and

insightful than when scholars or practitioners work on the problems alone (King and Horrocks 2010; Yin 2014).

The methodology for this research project can be described as following an abductive philosophy. This was appropriate due to the lack of existing theory, and the emphasis on building theory before the development and as opposed to testing it (Dubois and Gadde 2002; Folger and Turillo 1999). As will be discussed in chapter 6 of this research, the abduction form of inference begins by engaging with the world and encountering a problem that is inconsistent with our understanding of theory and starts with a critical practical problem in chosen context (i.e., the retail sector in the UK) (Dubois and Gibbert 2010). As a result of adopting a process theory approach, this research advances fundamental knowledge of a complex phenomenon by following the four steps of a research model proposed by Andrew Van de Ven (2007) in his seminal work "Engaged Scholarship: A guide for organizational and social research". Understanding of the research approach for this thesis follows the four critical steps of process theory design known as problem formulation, theory building and philosophical approach, research design, and problem-solving (Van de Ven 2007; Van de Ven and Polley 1992).

To achieve the research objectives, answer the research questions, and follow the research approach as explained above, this research is followed by two phases of data collection including qualitative interviews with key informants and case study methodology.

Phase 1 will include semi-structured qualitative interviews with key informants from the technology suppliers in the UK retail sector. This also extends the limited empirical

evidence on processes, which happen prior the final adoption or rejection of technology in the UK retail sector. Altogether 25 interviews with managers involved in the implementation process as well as practitioners, who are knowledgeable in the area of understanding the role of technologies from the UK retail sector, were held (e.g., marketing and sales directors, technology managers, retail specialist, innovation managers, marketing managers). The interviews were mostly unstructured but covered the story of the implementation process and motivations behind it. They also included actions taken related to the implementation, the relationship between the technology suppliers and their clients (primarily the retailers), and the impact on the community. With the aims of the project to study a phenomenon that is dynamic and process in nature, this phase aimed to study the processes and practices of the implementation of technologies in the UK retail sector and before the final adoption or rejection of the technology. These processes highlight how different technologies are considered based on their features and key benefits. The key result will be a roadmap for the implementation process of technologies alongside a classification of technologies in the UK retail sector known as the typology of the technology spectrum.

Phase 2, will include an initial exploratory phase including nine main case studies in the UK retail sector as well as using follow-up interviews. During this phase, the classification of technologies (presented as the typology of technology spectrum) will continuously be updated to demonstrate the key features and value drivers of different groups of technologies. Using theoretical and polar sampling methodology, nine main case studies from the UK retail sector were selected to demonstrate the key features and benefits of the implementation process of technologies in the UK retail sector. The case studies were

selected from a diverse and extreme range of samples from very high to shallow performing cases. The selection of the cases enables the observation of the internal and conflicting patterns of the implementation process of technologies in the desired context.

Furthermore, the outcome of both phases of the data collection is presented in the form of a typology of retail business models in chapter 9. The typology includes nine unique types of business models for the retailers in the UK retail sector. Each cell in the typology is called an “ideal type” and represents a retail business model, which highlights the key benefits and requirements of different groups of technologies. As such, nine unique types of retail business models are developed and presented including a precise definition and detailed description for each in chapter 9.

1.7 STRUCTURE OF THE RESEARCH PROJECT

This thesis consists of ten chapters and is structured as follows:

Chapter One, which is the introductory chapter, explains the research background of this project. It provides a summary of the key areas of the literature and explains the main theoretical and practical gaps. Next, it presents the key contributions of this research. The research approach is briefly explained. Finally, the research objectives and their connections to the research questions are reflected.

Chapter Two explains the research context of the thesis in more details. It highlights the importance of technology in the UK retail sector while it explains the changing face of the UK retail market. It provides practical insight for the reader to understand the critical role of technology for the retailers competing in the UK market.

Chapter Three reviews the literature on the importance of technology for innovating services. It explains the concept of service innovation and the key characteristics of it. It also provides insights about the importance of service innovation in a digital market. Then, it discusses the nature of technology and its importance for developing services. Next, the implementation stage of innovation decision-making is explained.

Chapter Four reviews the literature about the importance of technology and service innovation in the retail industry. It reviews the literature of the key theoretical foundations of this research. The key theoretical frameworks, which are known as “Profiting from Technological Innovation” (PFI) and “Service-Dominant Logic” (SDL), are explained. Next, it discusses the concept of value and the importance of delivering value for a retailer. Different types of value delivery including value creation, value appropriation and value co-creation are explored. Then, the role of technology in the retail literature is explored, and a summary of the key literature on this phenomenon is presented. By the end, the key value drivers of technology in the retail are presented and explained.

Chapter Five explains the development of the conceptual frameworks of this research. It presents the integrative framework of the research as a result of incorporating the PFI and SDL frameworks. In doing so, the PFI-informed S-D logic framework is presented. Then a critical argument explaining how a trade-off between appropriation and co-creation of value emerges in the form of service ecosystems is developed. Finally, the importance of the development of the conceptual frameworks as well as the typology of value in this research is explained.

Chapter Six reflects the research methodology and design. It highlights the different stages of process theory design. The abductive philosophical approach of this research is explained. The research methodology is discussed in detail. It follows two phases of data collection including semi-structured qualitative interviews and case study research. Next, the rationale for the selection of the typological case research is presented.

Chapter Seven discusses the results of phase 1 of the data collection process, which includes the semi-structured qualitative interviews with the key informants from technology suppliers in the UK retail sector. It uses the interviews with the key informants and presents a model of technology implementation process. This model consists of nine stages, which are explained in detail.

Chapter Eight presents the result of the case study research. It investigates nine case studies in the UK retail sector. Also, a typology of technology spectrum in the retail sector is presented. Each case study explores a unique type of technology adopted from the typology of the technology spectrum. Finally, by the end of each case, key features and benefits of the technology implementation process are mentioned.

Chapter Nine explains the analysis of both phases of data collection including phase 1 and phase 2. As a result, the typology of technology spectrum in retail is updated and re-presented in the form of a typology of retail business models. Each cell in the typology is introduced as an ideal type and represents a unique type of business model for the retailer.

Chapter Ten reflects the implications and conclusion of this research. It highlights the implementation of the substantive findings and contributions to the literature. It also

discusses the key contributions of the integrative conceptual frameworks presented in this research. Then, it provides insights into the emergence of an interactive model in a B2B marketing context. It revisits and answers the research objectives and the research questions. Next, the theoretical and practical contributions are explained. Finally, the limitations and avenues for future research are presented.

CHAPTER 2 RESEARCH CONTEXT

2.1 INTRODUCTION

This chapter provides an overview of the research context. As stated in chapter one the key focus of this research is on understanding the vital role of technology in delivering value and advancing service in the UK retail sector. While chapter one justified the retail sector as the choice of research context, chapter two explores statistics and provides an overview of the retail industry globally and the UK retail sector in particular. It also provides statistics about the sales, value growth, and future forecast of the key players in the UK retail sector from the past ten to the next five years. This is predominantly important as the retail industry in general and the UK retail sector in particular is facing increasing levels of change. Retail is a notoriously tough industry and the pressure on margins has never been greater. Retailers that proactively figure out how to deliver value through services innovation will be the ones to thrive. As such, there remains a need to shed light on the challenges and latest trends that are undergoing in this sector. Furthermore, studying the fundamental role of technology as a key element causing various challenges and opportunities for achieving competitive advantage remains critical.

2.2 RETAILING IN THE UK

2.2.1 GLOBAL ECONOMIC FORECASTS

The UK economy struggled to achieve significant growth in the year 2016, with many consumers remaining cautious in their spending as a result (Euromonitor International

2017). There was meanwhile further economic uncertainty in 2016 as a result of the Brexit referendum, with the potential repercussions dominating the UK's media in the first half of the year. Table 2.1 provides a comparison and future forecast of the global retail market value from 2007 to 2021 as well as the position of the UK retail sector within this market. Further, Table 2.2 and 2.3 highlight a comparison of the market share for the store and non-store-based retailers in the UK.

Table 2.1 Global retail market value in USD⁴

Region	Units	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Australia	bn USD	197.7	205.1	199.1	230.6	263.8	273.1	263.2	253.7	217.8	223.8	234.9	233.3	222.1	233.4	–
Brazil	bn USD	–	–	330.5	445.1	530.5	526.10	537.59	563.57	410.45	409.26	475.11	482.28	513.90	528.80	552.58
Canada	bn USD	333.4	350.5	324.0	376.3	406.8	409.9	407.0	395.5	341.4	337.1	346.9	366.2	368.7	356.4	383.1
China	bn USD	–	–	1,241.3	1,433.5	1,753.7	2,033.2	2,295.6	2,521.5	2,667.2	2,671.2	2,781.4	2,956.6	2,991.5	3,074.4	–
						0	5	1	5	4	2	1	4	7	2	
Colombia	bn USD	–	–	31.656	39.546	44.891	49.117	49.650	51.474	42.454	42.631	48.390	55.095	58.013	61.991	69.083
				5	1	8	6	1	38	17	92	51	48	32	12	52
France	bn USD	676.6	746.0	679.7	665.3	718.6	677.9	697.6	699.9	595.0	609.4	629.9	669.3	671.0	713.2	741.0
Germany	bn USD	651.0	714.9	650.1	639.7	683.8	643.3	677.5	689.2	591.8	606.4	625.8	671.4	672.4	712.4	–
India	bn USD	363.39	393.31	387.25	463.09	503.72	479.89	489.93	518.31	552.28	593.11	679.22	733.65	744.32	855.68	936.33
		3	4	0	0	0	7	9	7	1	6	1	3	8	7	3
Indonesia	bn USD	89.54	93.73	98.730	131.75	163.21	169.72	170.53	166.02	170.51	187.18	208.82	226.98	245.56	275.32	312.71
Italy	bn USD	–	–	–	–	–	417.92	428.43	430.76	367.13	371.20	381.46	401.81	395.32	413.53	422.28
							32	04	73	73	67	38	15	25	56	46
Japan	bn USD	–	–	–	–	1,695.6	1,723.8	1,423.7	1,334.0	1,130.8	1,286.0	1,250.3	1,297.2	1,339.3	1,380.9	1,448.5
						22	94	08	07	21	98	01	85	62	11	48
Mexico	bn USD	–	–	–	218.26	244.57	257.94	277.73	280.74	259.63	241.93	261.95	269.90	283.34	305.02	340.52
Russia	bn USD	424.90	561.13	459.96	543.69	650.24	693.72	743.90	686.71	451.89	419.58	511.35	533.23	577.31	607.50	652.88
		2	5	2	4	8	6	4	7	4	1	9	2	8	2	2
South Africa	bn USD	–	–	–	–	100.3	96.54	87.63	83.59	76.47	71.906	84.940	90.453	92.051	93.342	95.897
South Korea	bn USD	270.96	244.42	218.97	265.05	302.72	310.61	323.04	343.03	326.46	332.43	355.02	362.08	366.39	377.78	402.96
		38	82	23	39	17	71	91	79	95	67	57	65	70	81	37
Spain	bn USD	–	–	–	–	–	300.0	303.9	302.9	265.6	272.9	285.2	300.8	298.7	322.0	333.3
Turkey	bn USD	–	247.9	195.6	233.9	248.7	261.2	271.1	259.6	222.7	214.7	199.2	207.1	212.9	225.2	236.63
UK	bn USD	612.6	585.9	515.8	509.5	564.4	567.8	573.1	602.6	571.8	518.8	489.2	497.9	491.1	494.8	506.3
US	bn USD	3,995.2	3,935.5	3,612.9	3,818.8	4,102.2	4,302.2	4,459.0	4,636.3	4,708.3	4,862.9	4,970.2	5,211.0	5,472.5	5,670.5	5,898.1
Vietnam	bn USD	35.75	47.57	55.24	65.560	74.372	86.078	95.601	105.54	111.77	118.54	130.72	141.35	150.55	162.69	177.02

⁴ Source: (Euromonitor Global Forecast 2017; Mintel 2017a, 2017b, 2017c, 2017d, 2017e, 2017f)

Table 2.2 Sales for store-based retailing in the UK

% current value growth, retail value rsp excl sales tax			
	2015/16	2011-16 CAGR	2011/16 Total
Grocery Retailers	0.1	1.6	8.1
Non-Grocery Specialists	0.5	-0.3	-1.4
Mixed Retailers	1.9	2.7	14.3
Luxury Retailing	4.1	4.7	25.8
Off-price Retailing	1.9	10.8	66.7
Store-based Retailing	0.4	1.0	5.1

Source: Euromonitor International from official statistics, trade associations, trade press, company research, trade interviews, trade sources

Note 1: Luxury retailing not included in store-based retailing total to avoid double counting as luxury retailing is a duplicate category already accounted for within non-grocery specialists and mixed retailers.

Note 2: Off-price retailing not included in store-based retailing total to avoid double counting as off-price retailing is a duplicate category already accounted for within apparel and footwear specialists and department stores.

Table 2.3 Sales in Non-Store Retailing by Channels in the UK

GBP million						
	2011	2012	2013	2014	2015	2016
Direct Selling	826.7	842.8	885.0	955.9	1,068.7	1,159.5
Homes shopping	5,106.3	4,719.7	4,389.4	4,055.0	3,659.7	3,274.0
Internet Retailing	27,183.2	30,782.3	35,769.0	42,028.6	47,102.9	53,632.5
Vending	596.3	405.7	395.7	408.7	426.3	448.0
Internet Pure Play Retailers	12,772.9	15,179.9	18,393.1	21,968.7	25,112.8	29,857.2
Mobile Internet Retailing	-	3,693.9	7,153.8	13,449.2	18,841.2	27,352.6
Non-Store Retailing	33,712.5	36,750.5	41,439.1	47,448.2	52,257.6	58,514.1

Source: Euromonitor International from official statistics, trade associations, trade press, company research, trade interviews, trade sources

Note 1: Vending data captures vending systems installed in public and semi-captive environments only. For further details refer to definitions.

Note 2: Mobile internet retailing and internet pure play retailers not included in non-store retailing total to avoid double counting as these categories are already accounted for within internet retailing.

Following the UK's vote to leave the EU, weaknesses for pound sterling and a dip in investment further contributed to consumers' financial concerns, although there are signs that the economy is proving more resilient than expected. Nonetheless, there was growing consumer price-sensitivity as a result of economic uncertainty throughout 2016 (Raconteur 2017a). This resulted in many players increasing their use of discounting and price promotions. Many players such as Tesco and eBay notably offered longer discount

events around Black Friday/Cyber Weekend in November 2016, with eBay for example offering a 13-day event (Euromonitor International Internet 2017). Many players also increased their use of price promotions, although not all. Marks & Spencer in apparel and footwear specialist retailers notably turned its back on discounting in 2016 and instead sought to reduce everyday prices for its range. Meanwhile, Many lower- priced channel benefited from rising price-sensitivity in the year, including variety stores, warehouse clubs and discounters (Euromonitor International Mixed 2017).

Price competition is notably likely to be intensified by the ubiquitous presence of smartphones. Consumers are becoming increasingly likely to check online prices while shopping in store and to buy online in response to even a slight price differential. However, currency fluctuations could result in many players struggling to compete on price if they primarily source goods overseas, particularly as they will also face additional cost pressures as a result in growth in minimum wage levels (Euromonitor Global Forecast 2017). Many players may thus shift towards UK production in the forecast period. Internet pure play retailer ASOS has notably announced plans to double its UK production capacity for its apparel and footwear private label range (Euromonitor International Mixed 2017). Discounters Aldi and Lidl are meanwhile also likely to benefit from their strong and growing focus on local sourcing in the forecast period (Euromonitor International Grocers 2017). Despite all these challenges, there is growing estimate that the total value of the retail industry will be likely to grow over the next five years (see Table 2.1 and 2.4). Furthermore, there is likely to be a growing focus on the importance of innovating services in the forecast period.

Table 2.4 Forecast Sales for Store-based and Non-Store retailing in the UK

GBP million	2016	2017	2018	2019	2020	2021
Store-based Retailing	301,058.7	302,615.6	303,849.6	304,919.1	305,974.8	306,772.4
Non-Store Retailing	58,514.1	63,898.9	68,508.5	72,597.0	76,226.4	79,057.5
Retailing	359,572.8	366,514.4	372,358.1	377,516.2	382,201.2	385,829.8

Source: Euromonitor International from trade associations, trade press, company research, trade interviews, trade sources

2.2.2 GROCERY RETAILING IN THE UK

Discounters continue to be the standout channel in grocery retailers in 2016, posting current value growth of an impressive 11% in 2016 (Euromonitor International Grocers 2017). Growth was supported by rising consumer price- sensitivity and ongoing expansion in the leading players' store networks, alongside a growing focus on luxury discounting. Lidl for example offered the cheapest lobsters in the UK in November at just GBP2.99 (Euromonitor International Mixed 2017). Discounters were the only channels to see constant increase of market share and brand value, while most other channels indeed saw current value sales decline in the year (see Table 2.5) (Euromonitor International Grocers 2017). This was partly due to discounters attracting more consumers but was also due to intensifying price competition, as other grocery retailers sought to compete with chains such as Aldi Group and Lidl (Schwarz Beteiligungs-GmbH).

Table 2.5 Retailers' brand value over the past five years in the UK

% retail value rsp excl sales tax Company	2012	2013	2014	2015	2016
Tesco Plc	23.5	22.9	21.9	21.5	21.2
J Sainsbury Plc	12.5	12.6	12.8	12.6	12.4
Wal-Mart Stores Inc	12.6	12.4	12.2	11.9	11.7
Wm Morrison Supermarkets Plc	9.4	8.9	8.6	8.6	8.3
Aldi Group	2.5	3.3	4.2	4.7	5.2
Co-operative Group Ltd, The	4.8	4.6	4.9	4.9	4.8
John Lewis Partnership Plc	3.3	3.4	3.5	3.7	3.7
Schwarz Beteiligungs GmbH	1.9	2.1	2.4	2.8	3.2
Booker Group Plc	0.8	0.8	0.9	2.0	2.2
Internationale Spar Centrale BV	2.0	2.0	1.9	1.9	1.9
Iceland Foods Ltd	1.7	1.7	1.6	1.7	1.7
Marks & Spencer Plc	1.2	1.2	1.3	1.4	1.5
NISA-Today's (Holdings) Ltd	1.0	0.9	1.0	1.0	0.9
Costcutter Supermarkets Group	0.8	0.8	0.9	0.8	0.7
Martin McColl Ltd	0.5	0.5	0.6	0.6	0.6
Farmfoods Ltd	0.4	0.4	0.4	0.5	0.5
Bestway (Holdings) Ltd	0.4	0.4	0.4	0.4	0.4
NBTY Inc	0.2	0.2	0.2	0.2	0.3
Midlands Co-operative Society	0.6	0.7	0.3	0.3	0.3
Midcounties Co- operative, The	0.3	0.3	0.3	0.3	0.3
Exxon Mobil Corp	0.3	0.2	0.1	-	-
Others	19.3	19.7	19.5	18.5	18.2
Total	100.0	100.0	100.0	100.0	100.0

Source: Euromonitor International from official statistics, trade associations, trade press, company research, trade interviews, trade sources

Overall grocery retailers meanwhile saw current value sales stagnate in 2016 over the previous year, as they did in 2015. This was due partly to intensifying price competition, with Aldi notably introducing a new wave of price cuts in February 2016 (Euromonitor Global Forecast 2017). Morrisons also continued its Price Crunch initiative, while Asda invested over GBP500 million in cutting prices. In addition, however, consumers are increasingly shopping online, not only for food and other groceries but also for key non-grocery product areas where hypermarkets once competed successfully such as consumer appliances (Euromonitor International Mixed 2017).

Convenience stores are meanwhile showing signs of maturity, with current value sales increasing by just 2% in 2016 in comparison to a review period CAGR (compound annual growth rate) of 4%. Slower growth was partly due to fewer convenience stores opening in

2016, with outlet volume growth of just 1% in comparison to a review period CAGR of 3% (Euromonitor International 2017). This was due to saturation in many areas, with fewer sites thus available and many stores facing competition from other convenience stores in the area. There was meanwhile an ongoing shift towards smaller outlets, as players sought to fit stores into busy urban areas.

Supermarkets saw 1% current value decline in 2016, with this being the second year of consecutive decline (Euromonitor International Grocers 2017). This decline was linked to a drop-in outlet volume, with many consumers shifting towards local convenience stores and forecourt retailers for top-up shops and discounters for weekly shops. Strong price competition meanwhile also contributed to decline, with these furthermore encouraging players to close less profitable stores. Tesco and Co-Operative notably closed a number of underperforming stores in 2016.

All major supermarkets and hypermarkets offer internet retailing and home delivery, with Morrisons being the last to launch this service in 2014. There is also pure online grocery retailer Ocado, which was established in 2000. The two main delivery options offered for online grocery purchases are home delivery click and collect, although some grocery retailers such as Tesco and Asda experimented with collection points located by London Underground Tube stations, albeit with limited success (Mintel 2015).

There continued to be new entrants to online grocery retailing in 2016. In June 2016, Amazon Fresh launched in the UK and has ambitious plans for growth. Consumers pay a 5 GBP fee for a one-hour delivery slot, although deliveries can be free if consumers spend over a minimum payment threshold or choose a less popular delivery slot (Euromonitor

International Internet 2017). Within discounters, Lidl while remained wholly absent from internet retailing, Aldi launched internet retailing for wine in January 2016, adding its weekly Special Buys discount purchases to the online range in March of the year (Euromonitor International Mixed 2017).

2.2.3 INTERNET RETAILING IN THE UK

UK consumers are spending a growing amount of time on smartphones, with this having a marked influence on retailing trends in the UK (Mobile Phone and Tablet Apps 2015). Shopping via smartphones is increasingly viewed as secure, while the convenience that mobile Internet retailing offers for shopping on- the-go is unparalleled. Many leading retailers meanwhile invested heavily in mobile-optimization towards the end of the review period and the launch of shopping apps (FitForCommerce 2017). Although sales growth via tablets is slowing, smartphone sales doubled in 2016 over the previous year (Oracle Internet Retailing 2017). This is partly due to smartphone screens getting bigger thanks to the “phablet” trend (phablet refers to a smartphone with a screen size close to a tablet). In addition, the ease of purchasing via smartphones improved dramatically. Established payment processing companies such as Visa, MasterCard and PayPal and new players Android Pay and Apple Pay have ensured such transactions can be conducted quickly and securely (Internet Retailing Top Suppliers 2017). Mobile internet retailing thus gained a dominant value share in internet retailing in 2016 for the first time, accounting for 51% value share and gaining 11 percentage points in share over the previous year (Euromonitor International Internet 2017).

Overall internet retailing saw 14% current value growth in 2016 over the previous year, with this only slightly slower in comparison to a review period CAGR of 15% (see Table 2.6) (Euromonitor International Internet 2017). Sales growth in this channel thus proved impressively resilient at the end of the review period, largely thanks to players from across retailing investing in their online presence. Growth was also boosted by a growing focus on social media marketing towards the end of the review period and by consumers continuing to increase their usage of smartphones. Furthermore, the constant growth of Internet retailing and the increasing demand for convenience among consumers, have resulted in a continuous value growth over the next five years in the UK as well (see Table 2.7) (Euromonitor Global Forecast 2017; FitForCommerce 2017; Raconteur 2017a).

Table 2.6 Internet retailers' brand value share in the UK

% retail value rsp excl sales tax					
Brand	Company (GBO)	2013	2014	2015	2016
3rd Party Merchants	Amazon.com Inc	10.6	13.3	15.0	16.7
3rd Party Merchants	eBay Inc	10.3	9.7	9.6	10.1
Amazon	Amazon.com Inc	12.9	11.4	10.4	9.8
Tesco	Tesco Plc	8.3	7.7	7.4	6.6
Argos	Home Retail Group Plc	5.0	4.5	4.3	3.9
Next Directory	Next Plc	3.5	3.4	3.3	3.1
John Lewis	John Lewis Partnership Plc	2.5	2.6	2.8	3.0
Sainsbury's	J Sainsbury Plc	2.8	2.7	2.6	2.5
Currys	Dixons Carphone Plc	-	2.8	2.7	2.4
Ocado	Ocado Group Plc	2.2	2.2	2.2	2.2
Very	Shop Direct Group Ltd	1.3	1.5	1.8	1.9
Asda	Wal-Mart Stores Inc	2.5	2.2	2.0	1.9
App Store	Apple Inc	1.6	1.6	1.6	1.6
Littlewoods	Shop Direct Group Ltd	2.4	2.0	1.8	1.5
Marks & Spencer	Marks & Spencer Plc	1.8	1.4	1.4	1.4
Asos	Asos Plc	0.8	0.9	1.1	1.1
AO.com	AO World Plc	0.7	0.9	1.0	1.1
itunes	Apple Inc	1.5	1.3	1.2	1.0
N Brown - various	N Brown Group Plc	1.2	1.1	1.1	1.0
3rd Party Merchants	Rakuten Inc	-	-	1.0	0.9
Play.com	Rakuten Inc	1.3	1.1	-	-
Currys	Dixons Retail Plc	1.4	-	-	-
Others		25.3	25.9	25.6	26.3
Total		100.0	100.0	100.0	100.0

Source: Euromonitor International from official statistics, trade associations, trade press, company research, trade interviews, trade sources

Table 2.7 Internet retailing forecast by value growth 2016-2021

% constant value growth, retail value rsp excl sales tax

	2016/2017	2016-21 CAGR	2016/21 TOTAL
Apparel and Footwear	6.0	5.1	28.2
Beauty and Personal Care	6.3	5.6	31.4
Consumer Appliances	5.7	4.7	25.9
Consumer Electronics	1.8	2.7	14.4
Consumer Health	13.2	8.8	52.8
Food and Drink	10.5	6.6	37.7
Home Care	7.7	8.9	53.5
Home Improvement and Gardening	13.5	9.8	59.9
Homewares and Home Furnishings	5.4	5.0	27.7
Media Products	10.9	7.8	45.9
Personal Accessories and Eyewear	8.8	5.4	30.2
Pet Care	6.4	4.6	25.0
Traditional Toys and Games	8.4	5.9	33.3
Video Games Hardware	12.0	6.7	38.1
Other Internet Retailing	15.3	8.9	53.4
Internet Retailing	10.5	7.1	40.6

Source: Euromonitor International from trade associations, trade press, company research, trade interviews, trade sources

Apparel and fashion remains the most popular product area in Internet retailing (Raconteur 2016, 2017a). There are many strong Internet pure play retailers competing in this area such as Asos and Boohoo.com, with these offering competitive prices and swiftly responding to fashion trends. There are also many multichannel players, with these not only seeking to grow online sales but also viewing service innovation through offering a click and collect facility as a means of boosting footfall in stores, such as Next, Marks & Spencer and John Lewis (Euromonitor International 2017). Apparel and footwear internet retailing is notably benefiting from the rise of fast fashion, with consumers increasingly focused on appearing on-trend or offering distinctive styling partly due to a desire to appear attractive and fashionable on social media (Euromonitor International Mixed 2017).

Internet retailing meanwhile not only enables consumers to easily track down key fashionable items but also provides a greater platform for using a diverse range of

technologies including hardware and software by the retailers (Euromonitor International Internet 2017). Apparel and footwear internet retailing players meanwhile also strive to offer an easy and convenient returns policy, with this encouraging consumers to buy in the knowledge that it will be easy to request a refund or order a replacement (BrightPearl 2017).

2.3 THE GROWING POWER OF TECHNOLOGY: RETAILERS MUST REINVENT THE ONLINE AND IN-STORE EXPERIENCE

Technology has radically changed the service context (Larivière et al. 2017). For example, new technologies such as smart grids, home management systems, self-service checkouts, cloud-based, Internet of things (IoT), high-tech, and high touch are changing the way customers perceive and manage energy consumption, becoming both consumers and producers in a radically changed energy market. The Internet of things (IoT) is also leading to the collection of huge and continuous streams of data with the potential to affect consumers, businesses, and societies in unforeseen ways. The IoT is a network of entities that are connected through any form of sensor, enabling these entities, which can be designed as Internet-connected constituents, to be located, identified, and even operated upon (Patrício et al. 2018; Raconteur 2018a).

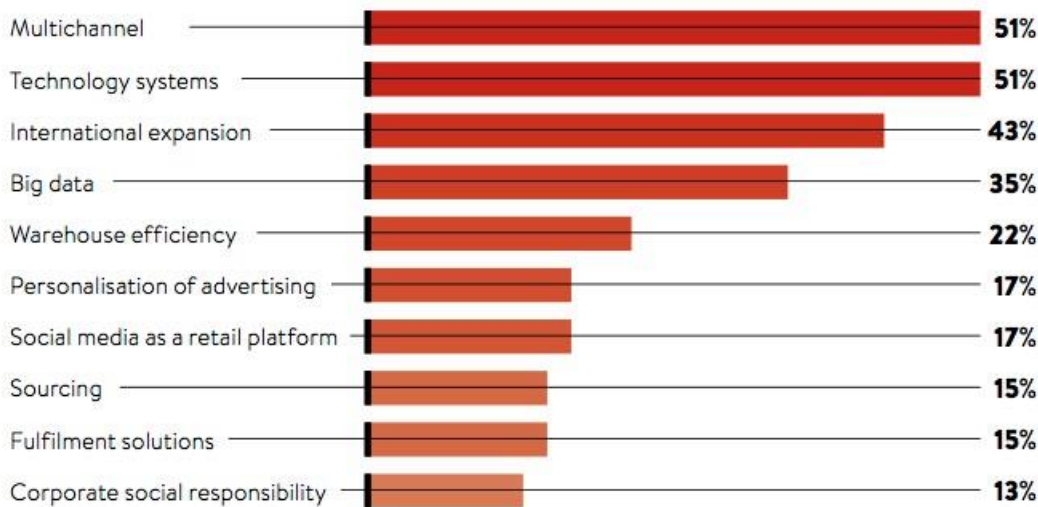
The adage that Britain is a nation of shopkeepers is under strain as retailers face up to changing consumer habits while technology suppliers large and small are offering retailers a staggering array of new technologies (Raconteur 2016). Although the UK economy has been steadily recovering, the retail industry is struggling to keep pace with the growth as consumers choose to spend their money on leisure activities instead (Oracle Internet

Retailing 2017). The British Retail Consortium's *Retail 2020* report forecasts the cost of the national living wage, projected increases in business rates and an apprenticeship levy will add £14 billion of costs on to the retail industry in the next four years (Raconteur 2015, 2017a). This amounts to approximately 20 percent of industry profitability. Retailers are truly locked into a survival of the fittest where only those that innovate their services will flourish. Digital and in-store investment in a world where customers expect a wide variety of fulfilment options does not come cheap.

Between 2004 and 2014, costs in the retail industry rose 33.8 percent as consumer spending only edged up 2 percent, according to research from the British Retail Consortium (BRC) and retail analysts Conlumino (CIA World Factbook 2016). As a way of comparison, in the previous decade costs jumped 19.6 percent and consumer spending increased 5 percent. High street retailing is a recreational rather than a practical exercise now to a significant degree. The days of an absolutely practical stand-and-deliver shop are limited. Furthermore, retailers are being offered a diverse range of technologies from smart payment to in-store scanning systems for use by consumers via their smartphones (Evanschitzky et al. 2015). These technologies provide retailers with opportunities of service innovation for consumers, as well as increasing value in terms of choice, convenience and quality (Westjohn et al. 2009). Surviving in a rapidly changing market requires retailers to considerably invest in new technologies and advancing them. As shown in Figure 2.1, different technological groups provide various opportunities for long-term economic growth.

TOP AREAS WHERE RETAILERS ARE FOCUSING TO DRIVE GROWTH IN THE NEXT THREE YEARS

Percentage of C-suites from global retailers who considered the area to be in the top three



Source: Raconteur/DWF 2016

Figure 2-1 Top Areas Where Retailers Are Focusing To Drive Economic Growth In The Next Three Years

People have always complained about retail innovations, either for products or services. Today, shoppers are keener on a seamless link between stores and homes (ShopperTrends 2017). Mobile has helped blur the lines between physical and online retail with consumers visiting stores to try products before purchasing online – putting e-retailers in direct competition within the territory of their physical counterparts (ShopperTrak 2017). This seems, at least initially, to be another nail in the high street coffin – customers trying in-store then buying at a discount online. Although the consumer purchasing habit is changing, there is one notion that is still trending and brings considerable opportunities to the retailers, which is technology. In a survey by *Oracle* and the *Internet Retailing Marketing Database*, 47% of the respondents including the key retail executives in the UK retail sector, highlighted technology as a fundamental tool for achieving competitive advantage and adding value for the retailers (see Figure 2.2). The report mentions that

47% of the respondents chose technology as the area, in which customer centricity, despite its rapid changes, is having the biggest impact.



Figure 2-2 Areas with the greatest potential for achieving competitive advantage in the UK retail sector

The traditional model of retail is to own a big space, buy a bunch of stuff you think will sell, try and sell it, then offer it at a discount if it does not sell. As shown in Figure 2.3, over the past few years, the more mature retailers have realized that to master the omni-channel, retailers need to create a seamless customer experience across all of these platforms (Brynjolfsson et al. 2013; Verhoef et al. 2015). Visiting the store, of course, allows bricks- and-mortar retailers one great advantage. While sales staff can make the greatest impact especially for luxury retailers versus other sectors, customers can in-store technologies to have a pleasant shopping experience (Department Store Retailing 2014). Further, the possibilities offered by in-store conversation allowing stores and luxury brands to differentiate themselves from their competition, increase brand loyalty and

enhance their reputation whilst simultaneously offering a digital in-store experience to the customer (Mobile Phone and Tablet Apps 2015) (see Figure 2.3).

In an attempt to improve the in-store experience while using technologies, Burberry plans a localized omnichannel strategy, using social to glean customer insight and boost loyalty, while focusing investment on selected cities (Raconteur 2016). A new customer app includes features including a mobile checkout to boost in-store and online conversion. Despite the obvious opportunities, many retailers facing tough trading conditions are wary of embracing this new philosophy (BrightPearl 2017). Integrating relevant back and front-end systems is hard and very expensive, requiring expertise that many retailers lack because many of the best engineers and designers are looking to work for technology companies (Internet Retailing Top Suppliers 2017). Curiously, the hottest tech retailer in the world, Amazon, is gradually embracing the bricks-and-mortar model.

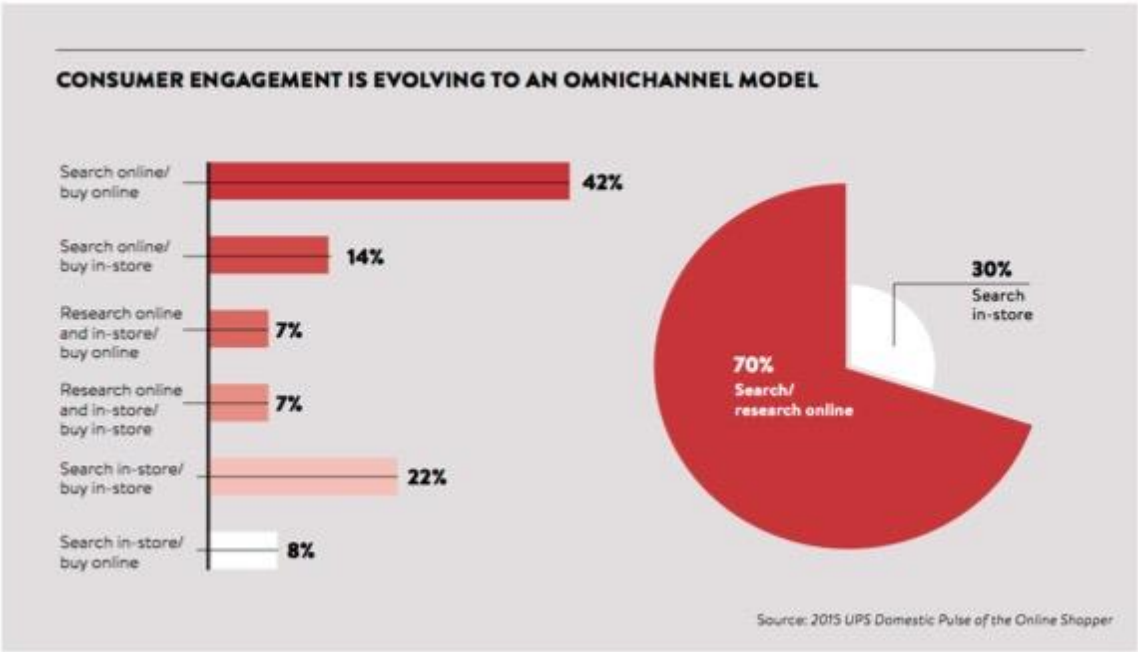


Figure 2-3 The proportion of consumer engagement in an omnichannel model of retailing

2.4 TECHNOLOGY FOR CUSTOMER EXPERIENCE: LISTEN AND LEARN FROM THE CUSTOMERS

Many retailers in the UK sector are failing to grasp that what was once considered cutting-edge technology does not provide competitive advantage anymore. For a digital savvy retailer, understanding that technology would create incredible growth and adds firm's value requires a clear perception about its customer experience. For instance, as shown in Figure 2.4, paying via contactless credit or debit card enjoys high acceptance among shoppers. The UK is the leading user of contactless payments in Europe, along with Spain and Poland, according to market research firm Euromonitor (Euromonitor International Mixed 2017).

Furthermore, retailers in the UK are shifting the bulk of customers from telephone to online and from online to mobile apps ordering (ShopperTrends 2017). This enables them to simplify their operations and keep up their customers' needs. A modern retail business model has to be adaptive and responsive rather than predictive, which means moving away from buying technology that takes a long time to implement and change (Raconteur 2017a).

UK CONTACTLESS ADOPTION AND SPENDING CONTINUES TO RISE

	2014					2015					2016		
	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar
Number of contactless cards in issue (m)	43.3	46.2	49.5	52.8	55.9	59.7	63.8	67.2	70.9	74.4	78.2	81.5	86.5
Monthly amount on contactless cards (£m)	116.5	146.1	174.9	253	302.7	287.1	431.1	515.9	619.8	758.6	1024	1107.3	1508.4
Monthly number of contactless transactions (m)	17.8	22.1	26.4	32.2	39.9	43.5	63.3	74.1	88.9	103.2	127.5	135.8	179.6
Number of terminals/outlet (000s)	181	188.1	191.4	197.7	208.5	219.3	229.1	245.4	271.9	288.2	304.1	318.6	354.8
Average value of contactless transactions (£)	6.53	6.60	6.61	7.86	7.59	6.60	6.81	6.96	6.97	7.35	8.03	8.15	8.4

Source: UK Cards Association 2016

Figure 2-4 Customers' changing attitude towards the adoption of contactless technologies in the UK retail sector

Modern retailers thrive on online reviews, social media commentary, and customer feedback using different types of technologies. While the technology acts as a platform between the customer and the retailer, it provides insights for the retailers to make changes to the way they do a business and their business models according (Raconteur 2016). From e-commerce giants to local bookstores, retailers are using the data they get from shoppers to create a feedback loop of personalized recommendations and promotions, and to impact their service innovation activities, merchandise and prices they offer (DigitalTrends 2016). But some believe digital communications are an impersonal and remote way for retailers to create meaningful relationships with customers, preferring a human interaction. Despite this perspective, the variety of the technologies, which are implemented in the UK retail sector, enables the retailer to improve customer experience at different points of contact, wither online or in-store. As such, retailers can

create a powerful dialogue with customers using data gleaned from loyalty cards and social media, but believes the human touch is essential in selling products (“Department Stores - UK - April, Mintel” 2016).

So how far can the explosion of technologies in forms of reviews, social media, in-store interactions, and other data collected via digital communications in the forms software or hardware help retailers innovate the services they offer? Over recent years, Facebook and Twitter have played a part in reshaping retail, acting as sounding boards for customer complaints and a platform for people to exchange shopping experiences (Raconteur 2015; ShopperTrends 2017). Some retailers use social media analysis to assess how people feel about the latest technologies, local stores, capturing comments from Twitter on waiting times, customer service levels, pricing and the quality of goods (Department Store Retailing 2014).

Facebook and Twitter have played a part in reshaping retail, acting as sounding boards for customer complaints and a platform for people to exchange shopping experiences (Raconteur 2017a). Meanwhile, many food retailers are lagging behind other sectors, such as air travel, when it comes to using customer feedback from social media and improve the operations within their business models (Cusumano 2012). Social media-listening has an advantage over review sites such as TripAdvisor and Amazon as a way of gleaning customer feedback. The comments made on social media are unprompted, so are likely to be the random thoughts of ordinary consumers (Harmeling et al. 2017). By contrast, review sites are vulnerable to fake reviews from businesses promoting their own profiles or rivals trying to denigrate competitors.

Even so, online reviews are having a massive impact on retailers, who are using them to learn about their consumers' preferences and to change their offers accordingly (Carlson and O'Cass 2011). The so-called closed feedback systems, such as Feefo and Reevo, are contracted by online and bricks-and-mortar retailers to send review forms to people after they have made purchases (Oracle Internet Retailing 2017; Raconteur 2016). This diminishes the chances of fake reviews or of vendors playing the system. The feedback revolution is set to intensify over the coming years as retailers rise to use virtual assistants into digital shop assistants powered by artificial intelligence technologies (ShopperTrends 2017). Customers will interrogate these technologies to get the best shopping experience. This will also allow retailers to become even more responsive to the demands of shoppers.

The rise of personal messaging services, such as WhatsApp, is also likely to transform social-listening. As people increasingly communicate via these apps, it will be more difficult for retailers to listen in to comments as they do on social media, since the messaging apps are private (Raconteur 2017a). But messaging services are now hosting retailer as well as virtual assistants to deliver personalized shopping services, allowing retailers to learn automatically from the behaviour of customers (ShopperTrak 2017).

As evident in Figure 2.5, using technologies to innovate and personalize service remains a highly profitable market, which requires further attention (Mobile Phone and Tablet Apps 2015; RetailWeek 2015). Retailers need to use technologies to understand the needs of customers, focusing more heavily on feedback and finding out about the needs of shoppers to innovate services through personalization (Harmeling et al. 2017).

MAIN BENEFITS OF PERSONALISATION TO RETAILERS

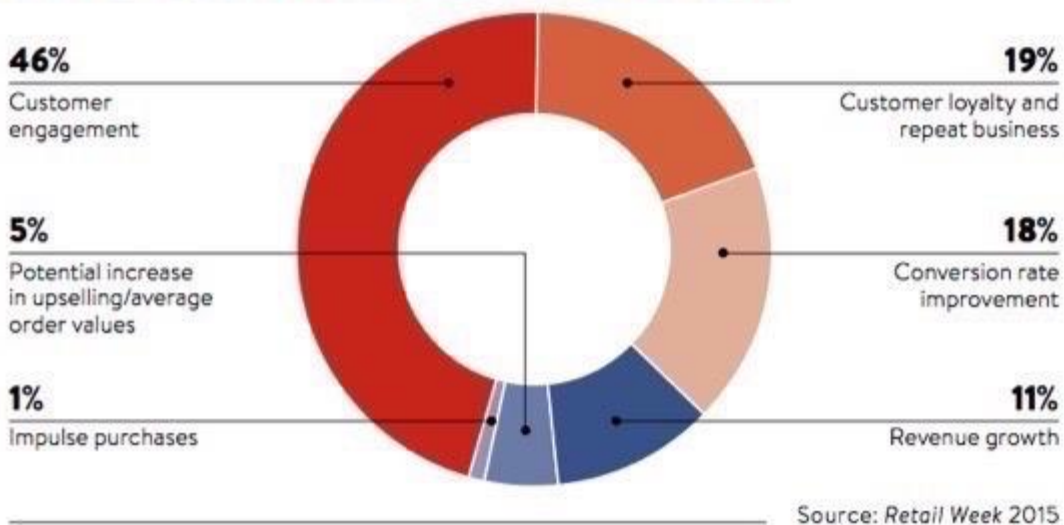


Figure 2-5 Key benefits of using technologies to offer personalization to the consumers

The role of bricks-and- mortar stores is changing, and the benefits of making the in-store shopping trip a unique and engaging experience are plentiful. Stores are becoming leisure destinations, as much about engagement and excitement as making product inventory available. On one hand retailers are creating spaces where people can spend their downtime, on the other hand they are utilizing technology to engage customers when they're in-store. As a result of cutting edge technology, shoppers are getting real-time information, tailored offers, shareable moments and greater choice while in-store.

Another great application of technology in-store is the use of beacons. These are small wireless devices, which send Bluetooth signals to mobile phones in the general area. It means that stores can identify certain customers in their stores and send personalized offers to shoppers.

Beacon technology can enable retailers to gain critical visibility into a customer’s in- store shopping behaviour. By integrating customer data from all of your channels, you can connect the dots between their activity in your web store and on your sales floor. Using this combination of data, retailers can personalize the offers and product suggestions they send in-store via beacons to match what customers have already been considering.

As younger consumers gain more buying power in the coming years (see Figure 2.6), these elements will become increasingly important as tools to engage these digital-natives, who spend more money than any other groups of consumers (ShopperTrends 2017).



Figure 2-6 Monthly spending on online shopping for clothes among different groups of consumers in the UK and US

2.5 USING TECHNOLOGY TO UNDERSTAND CUSTOMER PREFERENCE

Increased consumer expectations present another challenge for small and medium-sized enterprises (Euromonitor Global Forecast 2017). A recent study by OC&C Strategy Consultants found that in the last two years the number of shoppers opting for next-day

delivery grew by 50 percent, while those willing to wait between three and five days fell by 10 percent. It also predicted that home delivery and click-and-collect sales will double in the next ten years, and that by 2025, 40 percent of all non-food sales in the UK will be made online.

Nevertheless, for SMEs that have convenience, cost, choice and a great customer experience built into their delivery and returns strategy, competing in this sector is entirely possible (ShopperTrak 2017). It does not make sense to offer all customers a delivery-in-30-minutes service, if 80 percent of them are happy to wait 24 hours or longer. Better to invest in understanding your customers and provide service innovation in delivery offering that enables the firm to make a profit, while suiting their needs (Raconteur 2016). This way, if the retailer makes a loss on one item, it is not necessarily an issue, as the firm knows that particular order is for a loyal and high-value customer (Meyer-Waarden and Benavent 2009).

Furthermore, fashion retailers in the middle-to-premium market range face some of the biggest service innovation challenges in providing fast and free or subsidized delivery. Their lack of purchasing scale and relatively long order cycles mean they do not have the agility of fast-fashion retail brands such as Zara and H&M (Raconteur 2017a). Operating on tighter product margins leaves them less to invest in free or subsidized delivery. A solution is to bring more production back on shore to reduce lead times and enable a more effective use of data to forecast future demand accurately (Lee and Grewal 2004).

The technology used so skilfully by the likes of Amazon to steal a march on competitors is increasingly being turned to the smaller retailer's advantage. This has introduced new

opportunities for the small and medium sized technology suppliers to take advantage of efficiencies that historically would not have been available due to price restrictions (Internet Retailing Top Suppliers 2017). In doing so, Internet of things technology will enable smaller firms to turn the tables. For instance, a delivery box or pod can be placed outside a house, only allowing entry to couriers who are given a unique code, and recording deliveries by photographing its contents and sharing via e-mail (Oracle Internet Retailing 2017; ShopperTrends 2017). This solves the issue of parcel theft and fraud, while customers can avoid having to pay for a specified delivery slot to coincide with them being at home. It can also provide valuable insights for retailers in the form of customer data (Raconteur 2014).

Smaller retailers can also maximize on the one thing that the likes of Amazon do not have – a nationwide presence of store locations. Retailers with physical stores should look at how these can be utilized to best advantage, for instance improving click-and-collect facilities or servicing all local customers with same-day delivery (see Figure 2.7) (Internet Retailing Top Suppliers 2017). There are also cost-benefits for the retailer and customer. Because the single deliveries include goods from multiple stores, the stores the consumer orders from share the cost charged to retailers for facilitating each delivery (Raconteur 2015). While home delivery can be hugely inefficient for the retailers, click and collect, by contrast, enables retailers to make consolidated deliveries to a network of stores, their own or through a third party (Raconteur 2017a). Further, consumer attraction to click and collect services has been considerably growing over the past few years in the UK as it enables the consumer to purchase online and collect the order in-store at a convenient time (see Figure 2.7). For smaller local retailers, being physically closer to the customer is

a huge advantage with massive sources of revenue, which should make it easier to fulfil orders and returns (Raconteur 2016).

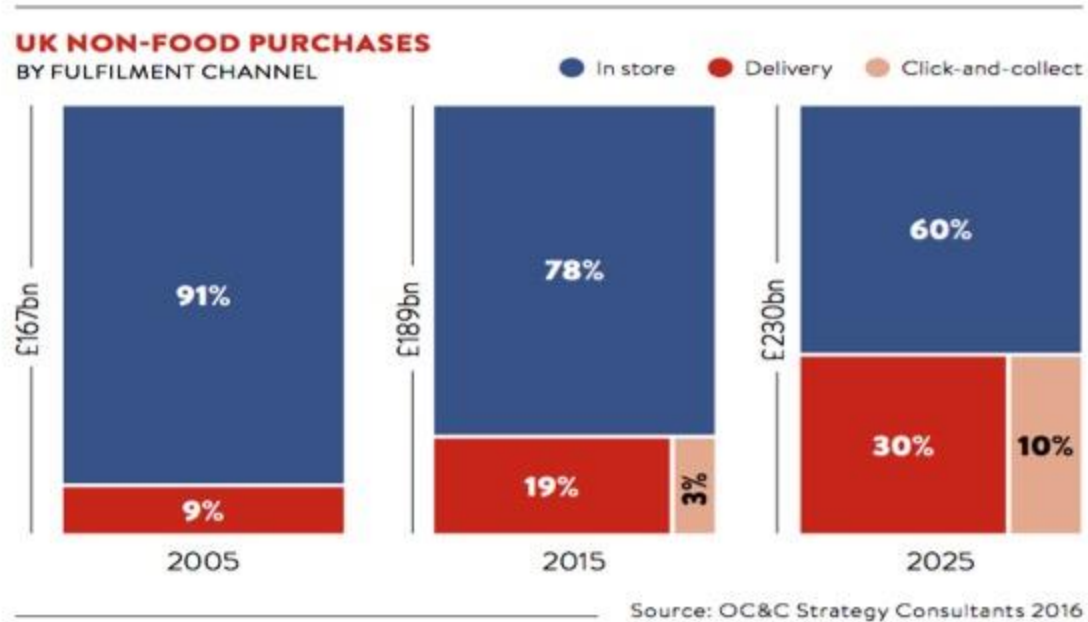


Figure 2-7 The growing demand for convenience through Click-and-Collect services

2.6 TECHNOLOGY FOR EFFICIENCY & EFFECTIVENESS: RETAIL ON THE GO

Today’s empowered consumers want to shop anywhere and anytime while they expect nothing less than a seamless experience with all their needs accommodated as they shift among mobile, technology trends and physical channels (FitForCommerce 2017). They want the freedom and choice of online shopping, balanced with the comfort and immediacy of a physical store (Gensler et al. 2012). They want to research and select items from their armchair, check out offers when they’re on the move, and then try out products in the store. In this sense, more retailers are realizing that automating their back office is essential for success. The challenge for retailers is to innovate services through the integration of people, processes and technology to present a single storefront to the

world and address the entire journey with the consumer’s convenience in mind. Achieving this fine balance requires full visibility into inventory, efficient management of the supply chain and a solid grasp of customer data (Raconteur 2014). Continuous improvement of the customer’s database enables the retailer to develop its operations efficiently through proper management of its resources over time. Customers will increasingly delegate buying decisions to machines, which will use the knowledge they build up about the customer to make purchases on their behalf (Raconteur 2016) (see Figure 2.8). It also requires putting the right technology and processes into store associates’ hands.

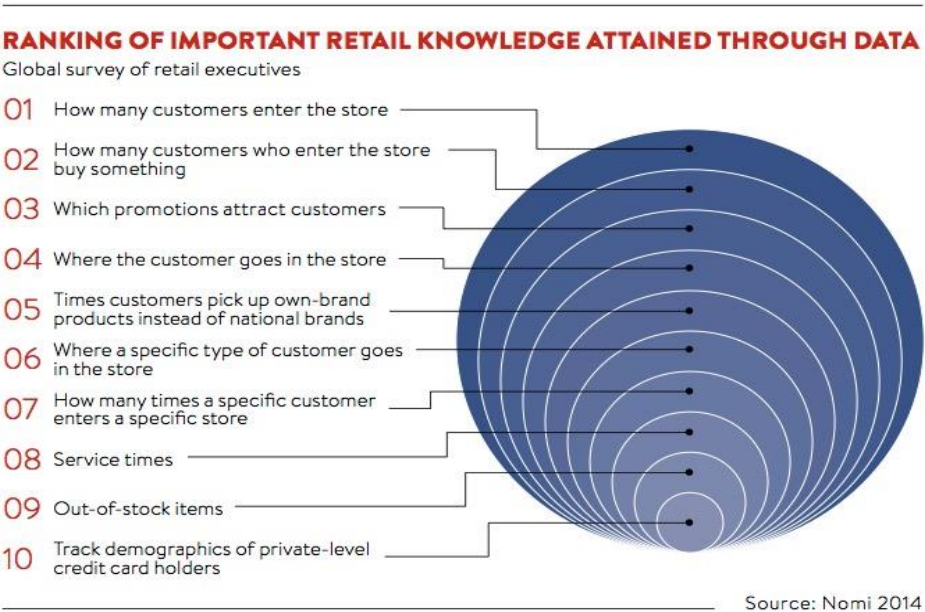


Figure 2-8 Ranking of important retail knowledge attained through customer behaviour data

The way goods are distributed is changing rapidly with the arrival of new technology, which is redefining the business models of B2B sellers (Lilien 2016). Consumers have been trained for convenience and ease of service so they expect things to be done that way quickly (ShopperTrends 2017). For the B2B vendors, if the customers have a choice of who

to buy from, then they are looking for something that makes it easier to execute the transaction (ShopperTrak 2017). Modern B2B e-commerce systems need to offer excellent parametric search, involving a number of elements such as price, color and size, just as a secondhand car website search function might offer car type, price, mileage and distance from buyer (Ampliance Content Index 2016; Raconteur 2017a). Retailers need to boost the customer service innovation through personalization and using a diverse range of tactics (see Figure 2.9) (Euromonitor 2015). These are becoming more important than price and availability, which are increasingly seen as basics. Retailers need to rethink their approach and seek to leverage an open, scalable and agile omnichannel commerce platform as well as an efficient and effective way for innovating services in the market (FitForCommerce 2017).

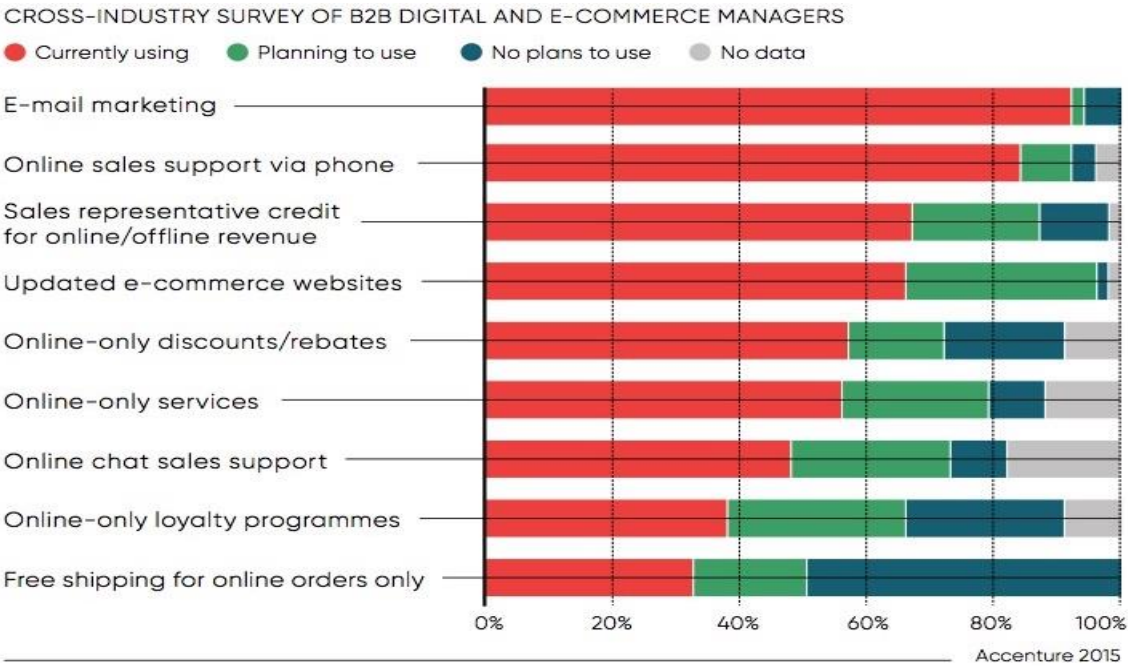


Figure 2-9 B2B tactics to promote e-commerce

Retailers must also develop new tools for tracking service online and in store to get a sense of the customer experience and satisfaction. Consider that when shipping from ecommerce-controlled warehouse, retailers closely monitor their operations for first-in-first-out and other key activities and metrics (Internet Retailing Top Suppliers 2017). They also need to monitor how they are handling new processes (such as ship-from-store) to ensure stores are maintaining the same service levels and delivering a consistent and quality customer experience (Raconteur 2013). This includes understanding how stores are performing in terms of placing and fulfilling orders. Imagine that store A fulfills 100 orders a week for ship-from-store and Store B only fulfills 85 of its 100 orders a week (FitForCommerce 2017). By monitoring, the retailer can figure out why store A is performing better than store B. Is it because of management or technology or process? Only the right data and analysis tools can help pinpoint the cause.

2.6.1 TECHNOLOGY FOR MOBILIZING STORES

Retailers truly striving to be customer-centric must reconsider the role of their physical stores and sales associates. In doing so, technology needs to be implemented to redesign the approach from the ground up to support this age of context, immediacy, personalization, and information (KeyNote 2014). Through the use of technologies, the experience throughout the entire shopping journey needs to be executed as a seamless and singular process where the in-store experience is a natural extension of digital and vice versa (BrightPearl 2017). The concept known as “endless aisle” is one way of addressing this: retailers place tablet kiosks at the end of aisles so consumers can conduct research and purchase products much as they would via their computers or mobile devices (FitForCommerce 2017). In other words, technology enables the consumer to

access and order from the full catalogue of available products, even those that are not currently in the store.

Using technology to deliver a seamless, omnichannel experience also extends to shopper interactions with store associates and customer service both online and in person (ShopperTrak 2017). In fact, shoppers expect the in-store staff members to be knowledgeable and informed. This means they must be able to sell and assist in store and use online tools and selling technology (DigitalTrends 2016). For example, store members must know how to place an order and ship it to the customer if an item is out of stock in the store. And they must know how to check the online order status for a customer in the store. Imagine sales staff adding to revenue by placing an order for store pickup or delivery to the consumer's house rather than simply saying "Sorry, we don't have that size in stock." By doing so, they save the sale (Oracle Internet Retailing 2017).

Considering that 37% of shoppers purchase additional items when they are picking up other items in stores (ShopperTrak 2017), a sales associate with an accurate view of each shopper can deliver additional conversions. Not only does this immediately boost the top line, it helps retailers decrease markdowns on unsold inventory, both of which lead to higher profits (Amplience Content Index 2016). Executing on this requires the aggregation of multi-channel data, the use of advanced analytics, and equipping store staff with tools/technology that informs them of each shopper. It also mandates that retailers break down channel and department silos, align goals across channels, and encourage and incentivize employees to deliver on the omnichannel promise (FitForCommerce 2017).

2.6.2 TECHNOLOGY FOR ENABLING OMNI-CHANNEL RETAILING

Retailers rely on a plethora of technologies and processes to enable service innovation for omnichannel retailing (Piotrowicz and Cuthbertson 2014). However, often, the importance these technologies – including those used to power inventory, call centre, payment processing, ecommerce, ERP and customer experience management – are overlooked. As a result, it is impossible to deliver a truly satisfying customer experience and offer service innovation continuously. In the midst of this evolution, retailers cannot afford to relax when it comes to technologies that enable omnichannel transformational because technologies that were cutting-edge last year are now considered table stakes (Internet Retailing Top Suppliers 2017).

It is counterproductive for retailers to invest hundreds of thousands of pounds in technology that will be out-dated in a year or two (for example, kiosks with card readers). Instead, they must scale their investments on research and development (R&D) and protect against obsolescence (Oracle Internet Retailing 2017). That requires the ability to determine what bleeding-edge technology has staying power when it comes to omnichannel and achieving competitive advantage. To date that has included technologies for mobile POS, mobile wallet, omnichannel distributed order management, and mobile store associate apps (for example, barcode readers, Apple Pay, or Tesco's Qwiq) (FitForCommerce 2017; Tugby 2016). In doing so, the existing technology suppliers can help many retailers select technology partners and often recommend finding a partner with a track record of being cutting edge and delivering service innovation, rather than working with point solution provider and limited R&D budget (BrightPearl 2017; Internet Retailing Top Suppliers 2017). Furthermore, while the average rate of invest on

research and development in the UK retail sector is 1.4%, there is little evidence on the statistics and the amount of investments that top retailers allocate to different sectors. Table 2.8 provides a summary of the expenditure on R&D performed by UK businesses for the period of 2005 to 2016.

Table 2.8 Expenditure on R&D performed in UK businesses: Detailed product groups, 2005 to 2016 ⁵

		£ million												% of total
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016
TOTAL	DLBX	13,734	14,144	15,676	15,814	15,532	16,045	17,452	17,409	18,617	19,982 †	21,038	22,224	100
Agriculture, hunting and forestry; Fishing	DLBY	..	88	..	88	..	102	133	132	121	135	139	132	0.6
Extractive Industries	DLBZ	59	59	82	90	140	152	195	172	209	230	206	186	0.8
Food products and beverages; Tobacco products	DLCP	276	314	328	303	290	306	366	364	437	431	424	504	2.3
Textiles, clothing and leather products	DLCQ	18	17	19	15	10	11	14	20	22	22	19	21	0.1
Pulp, paper and paper products; Printing; Wood and straw products	DLCT	52	55	53	56	26	28	21	28	48	48	49	61	0.3
Refined petroleum products and coke oven products	DLCE	245	279	274	94	95	73	72	76	110	189	178	144	0.6
Chemicals and chemical products	DLCC	637	684	668	630	610	666	523	665	754	784	838	1,020	4.6
Pharmaceuticals	DLCD	3,374	3,521	3,935	4,354	4,424	4,673	4,914	4,208	4,039	3,855	4,165	4,122	18.5
Rubber and plastic products	DLCR	55	90	79	78	62	80	97	105	99	127	137	188	0.8
Other non-metallic mineral products	DLCS	44	51	48	53	57	56	60	47	47	62	54	64	0.3
Casting of iron and steel	DLCJ	34	38	..	47	43	28	44	45	27	51	40	30	0.1
Non-ferrous metals	DLCB	8	6	..	72	..	86	77	56	56	76	62	75	0.3
Fabricated metal products except machinery and equipment	DLCL	74	68	91	73	93	93	119	105	113	110	123	111	0.5
Machinery and equipment	DLCO	905	929	1,033	790	873	809	973	997	1,043	1,011	966	912	4.1
Computers and peripheral equipment	DLCN	92	67	83	123	151	157	180	187	260	276	316	328	1.5
Electrical equipment	DLCB	394	458	547	577	577	513	509	463	398	461	494	426	1.9
Consumer electronics and communication equipment	DLCB	788	748	667	700	547	474	511	689	877	912	989	837	3.8
Precision instruments and optical products; photographic equipment	DLCM	475	462	544	591	498	490	599	644	617	670	661	726	3.3
Motor vehicles and parts	DLCG	744	754	933	1,156	1,039	1,237	1,525	1,763	2,101	2,443	2,808	3,370	15.2
Other transport equipment	DLCI	21	25	28	30	..	46	50	48	64	78	93	90	0.4
Shipbuilding	DLCH	127	134	136	157	173	185	226	229	233	265	300	315	1.4
Aerospace	DLCF	2,169	1,832	2,070	1,732	1,466	1,437	1,438	1,511	1,639	1,666	1,699	1,905	8.6
Other manufactured goods	DLCU	26	24	27	36	98	136	146	133	175	183	191	167	0.8
Sewerage, waste management, remediation activities	DLCV	1	1	3	3	9	11	10	12	17	19	42	38	0.2
Electricity, gas and water supply	DLCW	15	21	35	40	66	60	58	106	123	148	155	118	0.5
Construction	DLCX	..	17	..	21	..	14	31	64	91	151	156	211	0.9
Wholesale and retail trade	DLDE	60	70	37	74	76	177	242	166	167	239	215	308	1.4
Transport and storage, incl. postal and courier activities	DLCY	8	16	21	12	24	17	18	..	35	38	46	43	0.2
Telecommunications	DLCZ	1,164	1,330	1,535	1,404	1,330	1,129	1,037	875	840	960	804	797	3.6
Miscellaneous business activities; Technical testing and analysis	DLDC	438	399	510	494	555	583	570	864	994	1,137	1,146	1,287	5.8
Computer programming and information service activities ⁶	DLDB	1,069	1,415	1,498	1,465	1,385	1,526	1,847	2,067	1,977	2,229	2,363	1,781	8.0
Software development ⁶	E4BM	-	-	-	-	-	-	-	-	-	-	-	744	3.3
Research and development services	DLDA	179	122	156	384	507	618	783	482	772	817	1,028	1,022	4.6
Public administration	DLDD	32	52	103	71	73	70	67	..	113	158	131	142	0.6

⁵ Source: (National Statistics 2016)

Finally, giving shoppers visibility into inventory can go a long way. Customers expect to be able to view inventory availability in store on the website (Taylor 2016). They expect that inventory number to be accurate. The retailer's challenge is how to display inventory and allow for unit inaccuracy, shrink, and sales that day. It's also imperative to adopt new fulfilment methods and commerce approaches, including buy-online- pick-up-in-store, ship from store, buy- online-return-to-store, and save the sale (Raconteur 2016). Even if an item is not available from the store, shoppers will be pleased when presented with a choice, such as shipping from another store (Intel 2015). Or shipping from a store when they are shopping online.

The upside of taking an order online and shipping items from stores is the ability to lower in-stock inventory, decrease shipping costs and offer customers' faster shipping. But achieving this goal requires solid planning and mapping stores to the online warehouse, which is only possible when leveraging fully integrated systems that offer cross-channel capabilities (FitForCommerce 2017). For example, if a Manchester-based customer orders online, it may be better that the retailer fulfil the order from store inventory in or near London rather than from a warehouse in London. Order management technology can help companies make intelligent fulfilment decisions and orchestrate orders across channels to better serve customers, optimize the use of inventory, and reduce fulfilment costs for higher profits (Internet Retailing Top Suppliers 2017).

In the UK some retailers such as Tesco and Asda have introduced 'dark stores' as a solution for warehousing, which is specifically designed for online orders. The dark stores provide retailers a better stock accuracy and more efficient order processing. For example, many retailers have begun to use supply chain technologies, such as RFID to improve their

efficiency and financial performance (Oh et al. 2012). The use of new technologies can also improve product display and shelf-space allocation (Murray et al. 2010), which highlights the importance of product merchandising.

2.7 CONCLUSION

The research context chapter provided an overview of the critical challenges that the retailers have been facing in the UK. It also highlights the importance of technology and different opportunities that it can provide for the retailers that are competing in the long run. Despite all the opportunities that technology can offer, many retailers are doubtful about substantial investments (either in the form of research and development for internal development or collaboration for external partnership) and remain cynical about its long-term impacts. This is mainly because although technologies enable retailers for continuous service innovation but maintaining the intellectual property of a particular technology is challenging task as can be duplicated easily.

While different groups of technologies are introduced in the retail sector, yet, achieving competitive advantage over long-term remain critical. Meanwhile, the changing consumer habits and their demand for more convenience and pleasant shopping experience leave retailers with no choice but to implement technologies more than before. While this requires retailers to invest on the application of technologies, online and in-store, it further requires the business model of a retailer to be adaptive and responsive. As such, the remaining budget for a retailer to invest on research and development becomes insufficient. This chapter explored different areas, where the application of technologies can provide different opportunities for service innovation. These regions are of particular

importance as the retailers' investment on research and development activities remains short and limited.

CHAPTER 3 USING TECHNOLOGY TO DELIVER SERVICE INNOVATION:

LITERATURE REVIEW

3.1 INTRODUCTION

The development of services has increased substantially in advanced economies. Innovating in services has made significant contributions to firm's competitive market position and rate of employment (Papastathopoulou and Hultink 2012; Storey et al. 2016). In the UK, the composition of the economy has experienced a structural change from the production to services industries over the last three decades (CIA World Factbook 2016). The structural change leads us to the service economy, where services contribute significantly to economies (Gallouj et al. 2015; O'Cass et al. 2013).

The different practices of service innovation are particularly those centred on opportunities provided by technologies and changing market behaviours. In this sense retail industry - as a well-known context for service activities - is facing an unprecedented level of change with increasing levels of competition and rising consumer expectations (Euromonitor 2015). Retailers have been facing fundamental levels of change in the past few years. These include discounters trying to increase market share by cutting the price; growing level of competition from multichannel retailing; and high pressure to become responsive and adapt to changes using technologies as an enabler (Raconteur 2016).

Some have successfully managed multichannel strategies through the introduction of online and convenience stores (Pauwels and Neslin 2015; Pelser et al. 2015), while others have tried to innovate new services through offering new technologies and improving

customer experience (Evanschitzky et al. 2015). Digital and in-store investments in developed economies such as the UK, where customers expect a wide variety of assortment options but with low prices, have become a challenge that does not come cheap. The new customer perception is forcing established retailers to re-evaluate their business practices and service network of activities. Against this backdrop, technology providers are offering retailers a staggering array of new technologies, from smart payment to in-store scanning systems for use by consumers via their smartphones (Patel 2014; Vize et al. 2013). These technologies provide the firms with the opportunities to develop and design new services while increasing value regarding choice, convenience and quality (Dotzel et al. 2013; Ostrom et al. 2015).

Over the recent years, an emerging solution has become the utilization of new technologies within different channels of retailing. The application of new technologies is associated with the influence of technological innovation on advancing services and offering better engagement through understanding customer needs (Ngo and O’Cass 2013; Ostrom et al. 2015). The result of this is that numerous technologies have been applied to the retail industry including self-service checkouts, contactless payment systems and beacon technology.

Furthermore, the diversity of the service sectors suggests that differences exist not only for the development of various new services but also between how different services bring competitive advantage by using technology tools (Ostrom et al. 2015; Zomerdijk and Voss 2011). Top performing retailers recognize that the delivery of new and advanced services requires their business models to be adaptive and responsive rather than predictive (Pelser et al. 2015; Sorescu et al. 2011). Meanwhile the variety of the services

that retailers offer needs to address the challenges around their operations and activities that support their core business capabilities (Sethuraman and Parasuraman 2005). The adoption of new technologies provides retailers with the opportunity to improve their operations and offer new services so long as they can understand customer needs and enhance customer satisfaction (Ngo and O’Cass 2013; Puccinelli et al. 2009). However, technological innovation and the use of technologies, which are aimed to deliver value for activities, are complicated and unpredictable. The success of new services through the application of technologies highly depends on a firm’s assessment processes and willingness to adopt the technologies widely.

The service innovation literature has identified different elements affecting the use or adoption of new technologies, which are limited mainly to self-service technologies (Dotzel et al. 2013; Evanschitzky et al. 2015; Storey et al. 2016). These elements include customer engagement, customer value management or customer willingness to use the technology consistently in business to consumer context (Ngo and O’Cass 2009; van Doorn et al. 2010; Weijters et al. 2007). While the primary focus of prior research has been identifying factors affecting consumer use or adoption of new technologies (Evanschitzky et al. 2015; Van Beuningen et al. 2009; Van Riel et al. 2004), the assessment processes and practices leading to the adoption or rejection of such technologies primarily in a retail context, are far less developed.

Prior research has uncovered the utilization of technologies for advancing and developing services and the opportunities it provides within the increasingly competitive service sector (Ostrom et al. 2015; Storey et al. 2016). It also broadens the scope of service innovation from a focus on technology to an understanding of market practices involving

multiple actors (Barrett et al. 2015; Bettencourt et al. 2013; Vargo et al. 2015). The adoption of technologies provides service firms with the opportunity to both improve the quality of interactive norms and behaviours while increasing profitability (Biemans et al. 2016; Skalen and Edvardsson 2016; Wieland et al. 2017; Wooder et al. 2012). This creates a need to understand precisely how these technologies could be utilized to create new value, and in some cases redesign the institutions that are influenced by interactions among multiple actors in service ecosystems (Bowen and Schneider 2014; Dotzel et al. 2013; Vargo and Lusch 2016). Indeed, there is a need for a more integrated and comprehensive framework that can provide a deeper understanding of the various assumptions and underlying service activities from which new technologies emerge (Biemans et al. 2016; Ostrom et al. 2015; Vargo et al. 2015; Vargo and Lusch 2017).

3.2 INNOVATION IN SERVICES

The importance of innovation processes has been widely recognized on both the empirical and theoretical levels. The increasingly prominent role, which is being played by service activities in productive systems have combined to make innovation within services an issue of great importance (Gallouj and Weinstein 1997). Innovation is the driving force behind competitive advantage and firm's value, with innovative firms reaping the benefits of increasing growth and customer satisfaction and customers enjoying the offered value of new and existing services (Biemans et al. 2016).

The study of innovation is no longer synonymous with a sole focus on new product innovations (Barrett et al. 2015). Instead, the notion of services as key to the growth of the so-called service economy is central to some approaches to consistent innovation

approaches in services. In some of the literature, service innovation is viewed as primarily market-driven, so that their introduction results in differentiation of the firm's relationship with its customers or partner or maintaining market position (Damanpour et al. 2009; Shostack 1987). In this way, services offered by organizations in the service sector are conceptualized to be similar to products introduced by manufacturing organizations (Cusumano et al. 2015; Evangelista and Sirilli 1998). As with product innovation, the drivers of service innovations are then construed as arising mainly from clients' demand for new services and executives' desire to create new services for existing markets or to develop existing services for new market opportunities (Damanpour et al. 2009; Ostrom et al. 2010).

3.2.1 THE CONCEPT OF SERVICE INNOVATION

The first literature reviews of the growing body of research about service innovation (Gallouj and Weinstein 1997; Johne and Storey 1998) concluded that more research was needed in several aspects of innovation in services. This aspect includes but not limit to fostering service infusion and growth, value drivers of service, profiting from service innovation, role of technologies in advancing services, open innovation for service, service blueprinting, service-dominant logic phenomena, service ecosystems, institutions and institutional arrangements, and service actors and ecosystems (Bettencourt et al. 2014b; Ostrom et al. 2010, 2015, Vargo and Lusch 2008b, 2017).

The increasing importance of services and focus on new services for competitive advantage has started a growing literature on service innovation (Papastathopoulou and Hultink 2012). While some authors make a distinction between service innovation and

new service development, the majority of the literature on understanding the concept of service consider service innovation and new service development as complementary (Biemans et al. 2016; Johne and Storey 1998; Ostrom et al. 2010). In this regard, Bettencourt et al. (2013) define service innovation as the output of devising a new or improved service concept that satisfies the customer's unmet needs. Further, service innovation can also be defined as a new process or service offering that is put into practice by an organization, and is adopted by, which creates value for one or more actors in a service network (Snyder et al. 2016; Witell et al. 2016).

Service innovation is often connected to new service development (e.g., Biemans et al. 2016; Menor et al. 2002; Storey et al. 2016). While new service development most frequently has its focus on the actual process of developing a new offering, service innovation focuses on the outcome of the process (Patrício et al. 2011). Building on a Schumpeterian approach, service innovation refers to a new service or the outcome of an improved service, which is put into practice and provides benefit for different actors involved with it (Witell et al. 2015, 2016). Therefore, while service innovation is mainly focused on the outcome of a service development process, considering the choice of the research context, this research defines the concept of service innovation in retail as "service innovation development".

Service Innovation Development refers the practices of improving existing services incrementally, which may in fact lead to the creation of a new service as a result of continuous refinement and modification. The constant adjustments are the results of positive or negative feedback from understanding customer shopping experience and buying patterns (Patrício et al. 2011; Zomerdijk and Voss 2010). However, the continuous

modification is not just created and developed by the prosperity of human needs, but rather directly and by individual technologies as well (Marinova et al. 2017). For instance, once we explore rocketry, we experience a need for space exploration (Arthur 2009). Considering a retailer as an example of a service innovator, once we possess the means for fast and secure card payment, we generate human needs. However niche the opportunity may seem, the generated human wants require a means for constant modification and improvement of the payment methods (i.e., a form of service innovation development) to control and improve the checkout experience. This may, over time, lead to the emergence and creation of a new service. For instance, the constant improvement of the payment method as a mode of service innovation development in retail, has led to the introduction of “Amazon Go” (a new kind of store using emerging technologies, which has no lines and no checkouts).

3.2.2 CHARACTERISTICS OF INNOVATION IN SERVICES

The context in which service innovation is delivered and experienced has, in many respects, fundamentally changed. For instance, advances in technology, especially information technology, are leading to a proliferation of revolutionary services and changing how customers serve themselves before, during, and after purchase. To understand this changing landscape, different authors have identified different areas that have the potential to advance the field of service innovation. These areas provide diverse characteristics of the concept of service innovation. For instance, the growing importance of advancing technologies and their impact on services is highlighted as a cross-cutting research priority that has the potential to impact multiple dimensions of service. Figure 3.1 provides a pictorial representation of the 12 broad research priorities, their

interrelationships (depicted by dotted arrows), and the fundamental characteristics they have with regards to innovating and advancing the services (Ostrom et al. 2015).

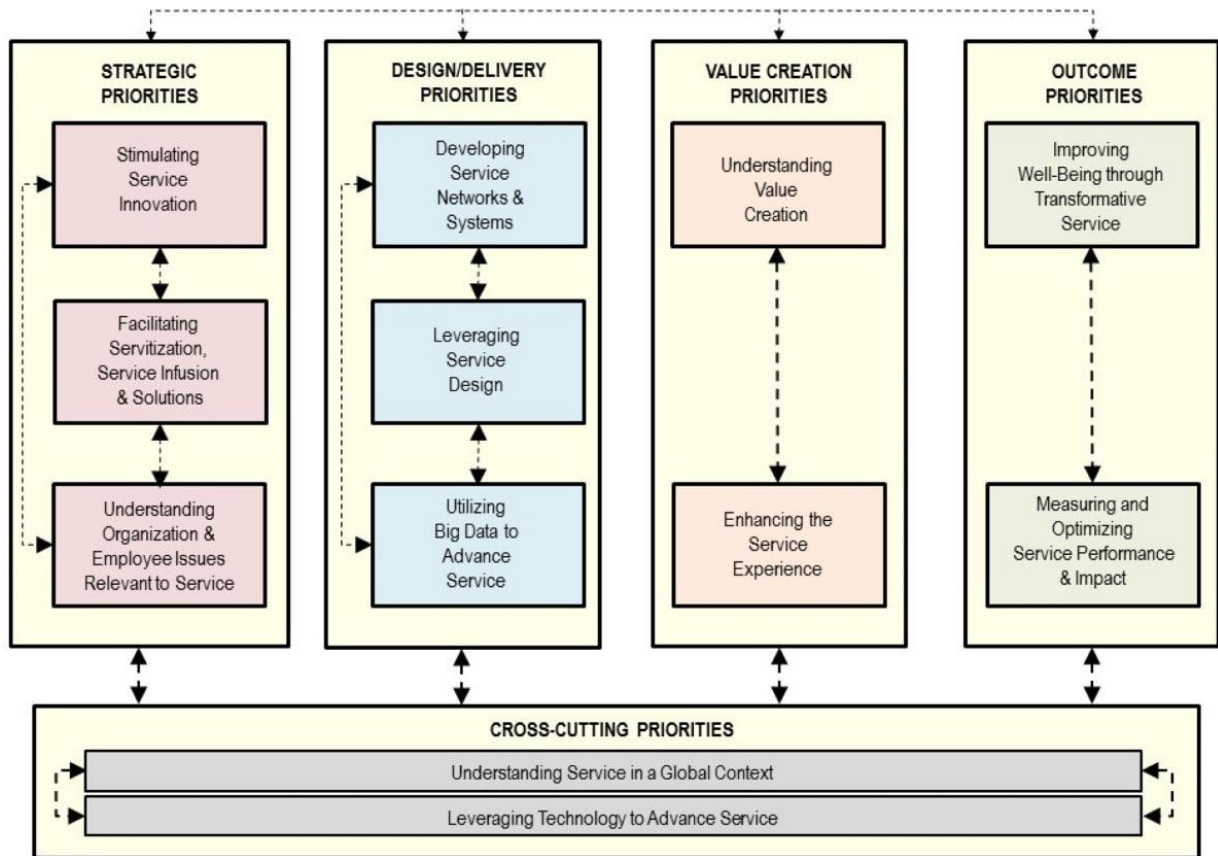


Figure 3-1 Characteristics and Priorities for Service Innovation (Ostrom et al. 2015)

Three of the priorities (stimulating service innovation; facilitating servitization, service infusion, and solutions; and understanding organization and employee issues relevant to successful service) are categorized as strategic priorities. They provide a comprehensive understanding about how understanding service processes and activities result in the creation of service networks and service ecosystems. The service ecosystems further collaborate with firm’s resources in the form of dynamic capabilities and result in long-term objectives and competitive advantage (Akaka and Vargo 2014; Jacobides et al. 2006).

Three priorities (developing service networks and systems, leveraging service design, and using big data to advance service) are labelled as design/delivery priorities (Ostrom et al. 2015). They show key drivers that influence how service is designed, configured and developed. Having a systematic design and development process for services is often considered one of the critical success factors for service innovation (Wooder et al. 2012). A systematic process involves several activities aimed at improving the efficiency and effectiveness of launching or developing a service, such as a formal procedure for generating and evaluating new service ideas, a drawing-board approach for service design, and testing new services with customers and a documented launch plan (Shostack 1982; Zomerdijk and Voss 2011). The service process can be viewed as a chain or constellation of activities that allow the service to function effectively (Bitner et al. 2008). This service could take place over a short time frame, or it could take place over several years.

Two of the characteristics (understanding value creation and enhancing the service experience) are value creation priorities, which focus on value as perceived by different members involved in a service process and their service experience (Ostrom et al. 2010, 2015). The service innovation and service marketing need a new mindset to fulfil the proper role in delivering value and creating a sustainable strategic advantage (Bettencourt et al. 2013). To extend its influence beyond the boundaries of current offerings, the firm, and conventional practice, marketing and markets must be viewed through a service lens (Bettencourt et al. 2014b). Providing a service perspective for delivering value, regards the proper focus for creating value and helping different actors and members to get one or more jobs done (Vargo and Lusch 2008b). This reorientation enables different members to

pose genuinely value-centric questions with regards to a multidimensional perspective for delivering value.

The two outcome priorities (improving well-being through transformative service and measuring and optimizing service performance and impact) emphasize the effect of service on people, firms, and systems (Ostrom et al. 2015). Although any service area could be investigated in relation to its impact on well-being-related metrics (e.g., quality of life, discrimination, and security), enhancing well being through service innovation will require, in many cases, shifting efforts to focus on different segments of society (Ostrom et al. 2010; Snyder et al. 2016). One of the most critical issues for services is the impact of service innovation on the low-income segment of the society. Although many well-being-related questions could be addressed in this context, the importance of understanding service innovation that occurs in this segment and its relationship to well-being and the alleviation of poverty requires further attention (Ngo and O’Cass 2013; Sok and O’Cass 2015).

The final two characteristics (understanding service in a global context and leveraging technology to advance service) are multidimensional priorities because they are interrelated with each of the other priorities and have the potential to influence almost every aspect of service (Ostrom et al. 2015). Given the commercialization of a variety of rapidly advancing technologies (e.g., smartphones, cloud computing, and wearable health-tracking devices) that can potentially affect virtually all aspects of service innovation, the importance of technologies for advancing services is highlighted as a cross-cutting priority for service innovation. Providing research-based guidance for effectively employing service-related technologies for the mutual benefit of all the members involves in the

activities of service innovation is a fundamental element of successful business strategy (Wieland et al. 2017).

3.2.3 SERVICE INNOVATION IN THE DIGITAL AGE

Service innovation in different sectors has examined how digital innovation facilitates the disintegration of firm's activities. It emphasizes the understanding of how firms apply modularity or break down their value chain of processes with the rapid growth of new service providers (Barrett et al. 2015). Across the business landscape, large companies have embraced service as an engine of their firms' growth. For example, as part of the reinvention of a century-old company, IBM transformed from a business model that (primarily) depended on selling computer equipment and software to a model that relies on providing services and on innovation in service for its competitive advantage and growth (Maglio and Spohrer 2008).

The diverse range of service offerings in developed and developing economies have demonstrated how service innovation can drive economic development despite limited resources (Pisano and Teece 2007). Fundamental to many of these service innovations are the rapid developments and widespread deployment of technologies, which facilitate the access of different beneficiaries and improve the quality of services. The importance of technologies to firms and industries in service sectors and service innovation has long been recognized from the emergence of digital economies (Dewar and Hage 1978; Gallouj and Weinstein 1997).

In these traditional approaches to service innovation, technologies have been understood as positioning tools in the service design, development, delivery processes, which

contribute to efficiency and effectiveness of service firms and which may lead to entirely new markets or categories of services (Shostack 1977). In contrast to these earlier perspectives that distinguish service innovation in the early stages of the digital economy from service innovation or innovation generally, many scholars have posited that all economic exchanges are essentially service exchanges (Vargo and Lusch 2011, 2017). Here, firms offer various service transactions and technologies have a fundamental and progressive role as resources in service innovation (Lusch and Vargo 2014; Vargo and Lusch 2004a, 2008a). From this perspective, technologies combine with other resources (such as skills and knowledge) to allow information to be transported in different contexts to create new opportunities for service exchange and innovation (Lusch and Vargo 2014; Vargo and Lusch 2016). Similarly, recent work on technological resources (Akaka and Vargo 2014) has highlighted the generative and creational role of technologies (Arthur 2009), which may assist to transform and generate new services. Along with other theoretical perspectives, these views suggest new ways of understanding service innovation in the digital age, whereas first, service firms use an adopted technology for facilitating services to improve the efficiency and effectiveness of existing services. At this point, the technology still behaves as an outcome. The second phase, after the birth or adoption of the technology, it is applied to improve the quality through the constant development of the services. In the third phase, the technology assists and causes in generating wholly transformed or new services as we seek to develop new knowledge about service innovation in the digital age (Barras 1986; Vargo et al. 2015).

Much research on the emergence of technology in the digital age is rooted in customary understandings of service as activities that a service provider performs for a user or

customer, and of services as the bundle of more-or-less routinized activities that characterize provider/user relationships (Barrett et al. 2015; Lusch and Nambisan 2015; Ngo and O’Cass 2013). When technology is viewed as a bundle of information and resource integrators that a service firm provides to its customers (users), the quality of service innovation will be assessed concerning service metrics for service quality (Weijters et al. 2007) and user satisfaction (Lusch and Vargo 2014). Furthermore, Advances in technology are leading to a proliferation of new service offerings while changing how multiple members in a service environment accommodate and interact with each other. Incorporation of technologies enhances service levels, lowers labor operational costs, and has the potential to impact multiple dimensions of service (Wieland et al. 2017).

Moving beyond these theoretical positions, Vargo and Lusch (2004a, 2008a, 2016) have argued for an alternative, service-centred logic, which has been implied in the combined work of various scholars for decades. With the collaboration of scholars from diverse disciplines, this service-dominant (S-D) logic has begun to expand and is increasingly being used as a foundation for understanding innovation in general. S-D logic begins with the reconceptualization of service (singular) as a process of using one’s resources (e.g., knowledge) for someone’s (self or other) benefit as compared with the more traditional conceptualization of services (usually plural) as a unit of output (i.e., an intangible product). The resources used in this service provision are created through the integration of existing resources (Akaka and Vargo 2014; Vargo and Lusch 2008b, 2017), typically acquired through service exchange. This resource-integrating, service-exchange activity, coordinated through institutional arrangements for mutual value creation, establishes service ecosystems, which are systems of resource-integrating actors connected by shared

institutional logic and mutual value creation (Bettencourt et al. 2014b; Vargo and Lusch 2011). Here, technology plays a central role in the formation and functioning of service ecosystems and thus in service innovation, as resources (importantly, information, skills, and knowledge) are combined and exchanged in new ways that create value for those actors engaged in the exchange (Vargo et al. 2015).

In parallel with this recognition of the increasing significance and importance of socio-material practices constituting service, innovation is developments in the growing literature, which theorizes digital technologies and artefacts as platforms for innovation. Given the importance of technologies to service innovations in modern economies, considering the implications of digital innovation for service and service innovation explicitly require critical attention. While there is an extensive body of research on the acceptance and application of self-service technologies, to date the prior literature fails to provide a comprehensive roadmap on how to profit from a diverse range of technologies within the growing digital economies, which have been introduced to advance services properly.

3.3 WHAT IS TECHNOLOGY AND ITS NATURE

What are we talking about when we speak of “technology”? What is technology? The answer, whether we turn to dictionaries or the writing of technology thinkers, is quite unclear. Technology, we are told, is a branch of knowledge, or the application of science or a study of techniques, or practice, or even a set of activities. The Oxford English Dictionary declares that technology is “the collection of mechanical arts that are available to culture to make its economy and society function.” Here, the mechanical arts are the

methods, practices, and devices a culture uses to make things function. However, if we accept this, can technology be knowledge and applied science and a study of something and a practice and a collection? All at the same time? Definitions matter because how we think of technology will determine how we think of it coming into being.

The service innovation literature broadly acknowledges the role of technology and its impact on designing and developing services. The term “technology” however, as Pinch (2008) points out, is elusive and problematic since it has taken on various disparate and often limiting meanings (e.g., in regards to material constraints). Therefore, unpacking this commonly used term further and providing a clear conceptualization is critical. Highlighting the importance of activities in technological developments, Arthur (2009, p. 28) describes technological advancement as the (re)combination of useful knowledge and defines “technology” as an assemblage of practices and components that are means to fulfil human purposes. Traditionally, technology has often been viewed as physical devices (Lynn et al. 1996), but Arthur’s definition shows that devices and processes do not have to be classified as categories, but, instead, that the term “technology” is applicable to a broad class of phenomena which spans both software (i.e., processes or methods) and hardware (i.e., physical devices). Arthur (Arthur 2009), for example, classifies contracts and legal systems as technologies. The ridesharing example supports and corroborates this broad classification. Downloadable phone applications, by definition, need both software and hardware to function. Software, in this context, includes rating procedures, driving skills and rules, and payment processes in addition to computer programs and algorithms (Lynn et al. 1996). The hardware side of car sharing technology, on the other hand, includes smartphones, a cellular data infrastructure, and cars.

Lastly, Arthur articulates how changes in technology occur through evolution: New elements (technologies) are constructed from ones that already exist, and these offer themselves as possible building-block elements for the construction of still further elements (Arthur 2009, p. 167). Using the example of a jet engine, Arthur (2009) and Pinch (2008) explain that such an engine could not have been brought into being without previous knowledge of compressors, gas turbines, precision machine tools and the refining of fuels. That is, all technologies, in a performative manner, are birthed from combinations of previous technologies.

Arthur (2009) gives technology three clear and compelling definitions, which this research will use throughout the thesis. The first and most basic one is that technology is a means to fulfil a human purpose. For some technologies, the purpose is an explicit process while for some others the purpose may be hazy, multiple and changing. As a mean, technology may be a method or process or device, a particular shopping pattern recognition algorithm, or a filtration process in chemical engineering, or a diesel engine. It may be simple: a chipset, complicated: voice recognition, material: scan as you shop, or non-material: algorithm.

The second definition highlights technology as an assemblage of practices and components. This covers technologies such as electronics or biotechnology that are collections or toolboxes of individual technologies and practices.

The third definition refers to the technology as the entire collection of devices and engineering practice available to a culture (Pinch 2008). We use this everyday definition of technology when we blame it for speeding up our lives, or talk of it as a hope for

humankind. Sometimes this meaning shades off into technology as a collective activity, as in technology is what Silicon Valley is all about (Arthur 2009).

3.3.1 ROLE OF TECHNOLOGY FOR DEVELOPING SERVICES

The critical role of technologies as an enabler to advance services has always been part of service management literature (Barrett et al. 2015; Evanschitzky et al. 2015). Naturally, it has been seen as relating to a balance between what is being delivered, how the service is being delivered and at what point in time (Dotzel et al. 2013; O’Cass et al. 2013). Meanwhile, technology application reduces the integration of time required to deliver services to firms, the technology provider, and the customer (Storey et al. 2016). It is not surprising, therefore, that the service literature considers the implications of technology for service at every level including strategic, developmental and operational (Barrett et al. 2015; Dotzel et al. 2013). Ostrom et al. (2010, 2015) emphasize the role of leveraging technologies for service innovation as a priority since it has the potential to influence almost every aspect of service. The pervasive nature of technology and its implications for service innovation within different contexts including retail requires new research approaches on how to conceptualize the application of technology on services (Biemans and Langerak 2015; Sok and O’Cass 2015). There has been a renewed interest on how firms and particularly retailers can implement and use the technology as a strategic initiative to create competitive advantage (Evanschitzky et al. 2015; Van Beuningen et al. 2009; Weijters et al. 2007). Storey et al. (2016) and Schepers and Wetzels (2007) state that to develop new service offerings, the use of technologies requires consistent planning and execution-oriented processes for firms.

Over the past decade, there has been extensive research on adoption or coproduction of the self-service model using online or in-store technologies (Evanschitzky et al. 2015; Meuter et al. 2003; Schepers and Wetzels 2007; Van Beuningen et al. 2009; Weijters et al. 2007). These studies have focused on the impacts of self-service practices from consumer or firm perspectives. They highlight the importance of technology investments and the way firms need to manage them. In a business-to-business context, they emphasize the view that firms are attempting (with varying degrees of success) to implement and use technologies that provide them with much needed informational and operational resource linkages. Meanwhile, the variety of research on business-to-consumer context demonstrates the role, which technologies play in customer satisfaction, consistent customer use, and creation of better interactions throughout the shopping journey (Dennis et al. 2012; Ngo and O’Cass 2013). While many studies have stressed the significance of self-service technology in different context and particularly retail (Evanschitzky et al. 2015; Meuter et al. 2005), there is little evidence to show how retailers examine the benefits of different technologies. Similarly, past research has underlined the role that suppliers play in the development or utilization of new technologies (O’Cass and Ngo 2012; Richey et al. 2008) but understanding the different techniques and approaches that can help reveal opportunities and gaps for the firms are far less explored.

The service management literature discussed so far are motivated by and adopt the core assumption that technology develops and advances service innovation (Barrett et al. 2015; Bettencourt et al. 2014b; Ostrom et al. 2010, 2015; Storey et al. 2016). Inspired by rapid developments of Internet and mobile computing technologies in the last decade, such as

the Apple and Android mobile operating systems, social media platforms, and cloud computing services, technology have more recently argued that digitization of information on a massive scale and the digital infrastructures that collect, process, distribute, and utilize this information are allowing radically new combinations of a diverse range of resources that produce novel services (Akaka and Vargo 2014; Barrett et al. 2015). These digital infrastructures enable different technology upon which many firms can innovate (Gawer and Cusumano 2014). As a critical focus of innovation, digital platforms act as a foundation upon which other firms can develop complementary products, technologies, and services (Cusumano 2011) as well as digital capabilities throughout the organization (Gawer 2009).

Acknowledging the complexity of technology, its relationship with firm's activities, and local contexts inherent to multi-regional service innovation, Wooder et al. (2012) argued that flexible standards can bring order to innovating services while also allowing adaptation to frequent changes and variation within developing countries. Wieland et al. (2017) argued similarly that cultivating flexible service architectures, which can evolve and context to accommodate specific users' needs, can facilitate future innovation. To manage the inherent tension of generative potential with control in technologies, Vargo et al. (2015) propose that the focus on the integration of firm's resources suggests that interactions among various actors are not only influenced by but also influence the key features of the technology. However, the dynamic relationship between activities and members point the maintenance, disruption and change of technologies (Gawer 2009; Pinch 2008). Moreover, this research tries to show how both technology and service innovation is shaped by ongoing negotiation and recombination of overlapping firm's

objectives and activities. This view of service innovation can establish a robust, parsimonious and dynamic framework for studying and understanding the central value drivers when using technology for advancing and innovating services (Dotzel et al. 2013). It further provides an insight to how the same practices and processes that deliver value drive the innovation of markets as well (Johnes and Storey 1998; Snyder et al. 2016; Sok and O’Cass 2015).

Before continuing the discussion explaining the revised perspective on Teece’s PFI framework and its integration with the foundations of service-dominant logic, there is a need to explain and justify the choice of the theoretical foundations. As such, several models and theories in the innovation literature considering the importance of innovation as a whole, the impact of technology, and the concept of service were examined to choose the right models and theories. While the rich and evolving innovation literature provides the researcher with a diverse range of models, considering the objectives of the research, three main models among a handful of theories were selected (as highlighted in Table 3.1). Table 3.1 provides a summary of the key theories and models considering their strengths and weaknesses.

Contemplating the objectives of the research, the choice of the models was mainly influenced by three motives: 1) the research takes place in a service environment with a B2B angle, where innovating services is a crucial source of competitive advantage; 2) understanding the fundamental role of technology in innovating services and the interactions between these two elements is critical; and 3) the research requires a model, which provides a rich and deep understanding of the activities and practices before the final adoption or rejection of a technology while considering the impacts of technology on

service innovation. Therefore, to provide a rich and thorough understanding and considering the potential of the expansion of the model into new and unexplored areas, three models were chosen. These models and theories are 1) *Diffusion of Innovation* by Rogers (2003), 2) *Profiting from Technological Innovation (PFI)* by Teece (1986, 2006), and 3) *Service Dominant Logic (SDL)* by Vargo and Lusch (2004a, 2008b, 2016). Further, Table 3.1 justifies the selection of the models for the purpose of this research considering their strengths and weaknesses.

Table 3.1 Key models and theories of innovation, technology, and service

<i>Innovation Study</i>	<i>Theme of the Model/theory</i>	<i>Strengths</i>	<i>Weaknesses</i>
Amit and Zott (2001; 2011; 2010)	Business model innovation	Highlights the importance of an innovation strategy and technology for value creation and capture.	Service is complementary of product. The main objective of technology is to improve efficiency.
Barras (1986)	Service innovation	Provides a theoretical foundation for innovation in services where technology transfers from goods to services sector.	Uses reverse product cycle to describe the integration of technology and service innovation and ultimately leads to product innovation.
Chesbrough (2013; 2006)	Open innovation	Defines a unifying platform for the integration of business models to involve different actors and create value.	Focused on successful and early adopters and based on case studies. Progressive firms already benefited from incoming knowledge and skills.
Cooper and Kleinschmidt (1986, 1995)	New product development (a process model)	Provides a generic skeleton for the management of new product development in firms and with an emphasis on preliminary market research	Limited to new product development process and manufacturing firms. Limited to a few activities within the firm's value chain.
Damanpour and Gopalakrishnan (2001)	Process and product innovation	Examines the dynamics that govern the adoption of product and process innovations. Introduces a product-process pattern of innovation.	Limited to the patterns of adoption at the firm level. An empirical study that considers service as a subset of product without a framework offered.
Gallouj and Weinstein (1997)	Service innovation	Lays the foundations of a theory that can be used to interpret innovation processes for service concept in manufacturing and service sector.	Takes products as its starting point. Focused on the characteristics and context of technology only rather than its impacts.
Nambisan (2002)	New product development (a customer model)	Establishes a distributed innovation model that involves various customer roles in the new product development process.	Focused on new product development with limited consideration of the importance of service for customer engagement.
Rogers (2003)	Diffusion of innovation	Well-established theoretical model for the trial of innovation with details about different stages of innovation decision-making.	Considers technology and product as the primary types of innovation.
Teece (1986, 2006)	Profiting from technological innovation	Key theoretical framework within the innovation and strategy literature benefiting from the role of resources and activities in a firm's value chain.	Primarily developed from a manufacturing perspective.
Vandermerwe and Rada (1988)	Service business model innovation (servitization)	Developed for corporations offering a bundle of customer-focused products and services.	Developed for manufacturing firms, where service is only valid and complementary for a product.
Vargo and Lusch (2004a, 2008a, 2016)	Service innovation and service dominance	Well-established framework where service is the basis of exchange and activities considering resources, embedded value, and transactions.	Unclear about how the customer can improve experience through co-creation of value and indirect interaction with the firm.
Venkatesh et al. (2007)	Adoption of innovation	Examines the evolution of the broader domain of technology adoption and acceptance as a whole.	Limited to the adoption stage with no attention paid to the steps before or after this phase.

3.4 THE INNOVATION DECISION-MAKING PROCESS

This section describes the five stages of innovation decision-making process. While each stage can be considered as a primary focus of the research, some stages have attracted more attention than the others, in theory, and practice. Diffusion scholars have long recognized that a firm's decision about innovation is not an instantaneous act (Czepiel 1975; Greenhalgh et al. 2004; Rogers 2003; Venkatesh et al. 2003). Instead, it is a process that happens over time and consists of a series of different actions. Most diffusion researchers who have probed the innovation decision-making processes for their respondents have arrived at a somewhat similar set of stages. Here the research introduces the five sequential stages in the process of innovation decision-making, which is initially introduced in the influential work "Diffusion of Innovations" by Rogers (2003).

In his work, Rogers (2003) explains how the introduction of a new ritual of innovation results in an innovation decision-making process. Through this process, an individual or any other decision-making actor passes from gaining initial knowledge of an innovation to forming an attitude toward the innovation, and reaching to the confirmation stage ultimately, where they are ready for the final adoption. This process consists of a series of choices and practices over time through which an actor evaluates an innovation and decides whether to incorporate it or not. This behaviour consists mainly of dealing with the uncertainty that is inherently involved in deciding about a new alternative to an idea previously in existence. The perceived newness of innovation and the uncertainty associated with this newness is a distinctive aspect of innovation decision-making (compared to other types of decision-making). Rogers (2003) explores different models of

innovation decision-making, which are mainly arbitrary, and proposes a 5-stage model for decision-making of innovation. This model comprises five key steps that happen before the final adoption or rejection of an innovation. He also considers the fact that diffusion of innovation happens after an actor goes through the five stages completely and becomes certain about its final decision. The final choice of the actor involves the incorporation of innovation in the form of an explicit adoption or rejection.

Rogers (2003, p. 5) defines diffusion as the process in which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in which the messages are concerned with new ideas. Further, diffusion of innovation is a very social process that involves interpersonal communication relationships (Greenhalgh et al. 2004). An evident principle of human communication is that the transfer of ideas occurs most frequently between two individuals (or actors) who are similar or homophilous (Chen and Hicks 2004; Rogers 2003). Homophily is the degree to which two or more actors who interact are similar in specific attributes. The opposite of homophily, heterophily, is defined as the degree to which two or more actors who interact are different in specific attributes. According to Rogers (2003), unlike the common understanding, one of the most distinctive problems in the diffusion of innovation is that the participants are usually quite heterophilous. That is, different actors or members within the same content are more or less skilled and knowledgeable than each other. A retailer is more technically competent than a supermarket regarding understanding consumer behaviour and preference. This difference frequently leads to ineffective communication as the two individuals do not speak the same language. However, when two individuals are identical regarding their

grasp of innovation, diffusion cannot happen as there is no new information to exchange. The nature of diffusion of innovation demands that at least some degree of heterophily be present between two or more actors. In a perfect case, the actors should be homophilous on all other variables while they are heterophilous regarding the innovation.

The innovation decision-making model consists of five stages as knowledge, persuasion, decision, implementation, and confirmation. These stages are explained in detail below.

3.4.1 THE KNOWLEDGE STAGE

This stage happens when a firm or other decision-making unit, is exposed to innovation, in which case technology. During this stage, the firm becomes aware of the existence of a technology and intends to gain an understanding of how it functions (Rogers 2003). While the innovation decision-making process is an information seeking and information processing activity, the knowledge stage is the beginning of motivation to reduce uncertainty about the benefits and different perspectives of new technology. The knowledge stage typically comes with the questions as “what is technology?” or “how does the technology work?” The degree of interest and motivation at this stage will lead a firm to the second and third stages of the innovation decision-making.

Although firms at this stage consist of early and late knowers, knowing about innovation is entirely different from using it. Many firms know about many innovations and technologies that their competitors are using, but they have adopted them. A firm may know about a trending technology but not take it as a perfect fit to its business model, dynamic capabilities or long-term strategies.

3.4.2 THE PERSUASION STAGE

At the persuasion stage in the innovation decision-making process, the firm forms a favourable or unfavourable attitude toward the technology. The firm becomes psychologically involved with the innovation. They actively seek information about the new technical information about the new technology, decide what messages or value they receive from the key benefits of the technology, and consider how they interpret the information that is received. At the persuasion stage, a critical perception about the technology is created and developed.

In persuasion stage, the firm may conceptually apply the benefits and use of the new technology to its present or anticipated future situation before deciding whether or not to adopt it. During the persuasion and the next stage (decision), the firm seeks to obtain critical information that reduces the uncertainty about future consequences or requirements. The requirement can include design or development of new or existing service, changes to business models, changes to activities and operations, and efficient use of the resources in different forms.

3.4.3 THE DECISION STAGE

The decision stage of innovation decision-making takes place when a firm engages in activities that lead to a choice to adopt or reject a technology. However, in a B2B context and when a firm is considering a technology for long-term benefits and competitive advantage, the decision stage takes a longer process. One way to cope with the inherent uncertainty about the consequences of technology is to try out the technology on a partial basis. In case of adoption, it involves a decision to temporarily adopt technology and use it

for a limited period. The temporary use of technology highlights the next stage in the innovation decision-making process, known as the implementation stage.

There is usually an implicit assumption in diffusion studies of a linear sequence of the first three stages in the innovation decision-making processes, knowledge, decision, and persuasion. While there is little research on these stages, many firms consider them one essential step involving market research about customer and competitors. Given that the primary focus of this research takes place in a B2B context, the three stages of knowledge, decision and persuasion take place as a whole. This combined action occurs when an innovation provider (for this research a technology supplier) introduces and promotes a technology to a new firm.

3.4.4 THE IMPLEMENTATION STAGE

The implementation stage happens when a firm puts technology in use (Arthur 2009; Rogers 2003). At this stage, the firm starts evaluating different aspects of the technology to provide a perfect fit for technology, its business model, and resources. Until this stage, the innovation-decision process has been a mental exercise of thinking and deciding. However, the implementation stage involves behaviour changes as the new idea is put into practice. Adoption of new technologies by firms follows the implementation stage directly. It is one thing for a firm to adopt a new technology, but a different thing to put the technology to use, as problems in how to use the new technology appear at the implementation stage.

In the decision stage of the innovation decision-making, a certain degree of uncertainty about the expected consequences of the innovation still exists for the firm. The

implementation stage rather directly. Problems of implementation are usually more severe when the adopter is a firm rather than an individual. In an organizational setting, the structure that gives stability and continuity to an organization may resist the implementation of innovation (Damanpour et al. 2009).

The implementation stage may continue for a lengthy period, depending on the nature of the innovation. Eventually, a point is reached at which the new idea becomes institutionalized as a regularized part of an adopter's ongoing operations. The innovation loses its distinctive quality as the separate identity of the new idea disappears. The point is considered the end of the implementation stage. It may also represent the termination of the innovation-decision process, at least for many individuals. However, for others, the fifth stage of confirmation may occur.

Our research focuses on the implementation stage of the adoption process (e.g., Arthur 2009; Rogers 2003; Venkatesh et al. 2007). In this stage, firms identify new technologies, through collaboration with business partners including different suppliers, and engage in assessing aspects such as operational, commercial and business considerations (Richey et al. 2008).

3.4.5 THE CONFIRMATION STAGE

Confirmation and adoption in the innovation decision-making process refer the decision to make full use of the technology (Rogers 2003). The confirmation stage takes place when a firm seeks reinforcement of an innovation-decision already made. After the implementation stage of decision-making, the firm secures further information that persuades it to adopt or reject the technology. In the context of using technologies for

business-to-business service offering, the firm plans to use the technology across its channels widely. Different parts of the firm start engaging with the technology. Because of the adoption, some or all parts of the critical activities in a solid start changing to make a better fit with the innovation or technology.

After the confirmation stage and once the firm has adopted the technology ultimately, it is possible that the innovation sits at the centre of firm's strategy for profiting from technological innovations. The nature of competition makes a visible shift to the use of technologies. At this point, the more the technology is used, the higher its attraction and adaptation to the firm's business model. Further, successful commercialization and adoption of the technology by the consumers become evident while bringing together different types of resources.

3.5 CONCLUSION

This chapter has defined the fundamental concepts used in this study. The concept of service has much developed over the recent years. Service no longer exists under the strategic umbrella of product. Various theories about product have moved over to the service literature. Different categories of service have been developed with regards to design, creation, and development. However, there remains a theoretical (and further developed empirical) gap within the service management literature, which critically evaluates the role of technology for innovating services. With the growing recognition of the role of technology for service in today's economy, both regarding operational advancements and improving customer interactions, increasing focus is required for the generic concepts of service including service innovation and new service development.

Furthermore, the diversity of the service sector suggests that differences exist not only between the innovation of services and the innovation of products but also between different types of services.

While the critical focus of this research is on understanding the role of technology for service innovation development in the retail sector, this chapter has reviewed the fundamental concepts and definitions required for this purpose. Meanwhile, different studies have established the importance of the adoption of technologies in different service sectors (Evanschitzky et al. 2015; Venkatesh et al. 2012, 2017). Yet, detailed insights about the activities and practices prior to the final adoption or rejection of technology alongside their impact on the associated service remain unexplored. The initial trial of technology and its influence on a product or service could be explained through recourse to the diffusion of innovation models (Rogers 2003; Utterback and Abernathy 1975). However, the growing importance of technology and its impact on the incremental nature of service requires research for a rich understanding of the two concepts together (i.e., technology and service). There also remains a knowledge gap to explore different practices within different stages of the diffusion of technology (either before or after the adoption stage); with a particular focus on the service sector (Greenhalgh et al. 2004; Venkatesh et al. 2007). As a result, this chapter aimed to shed light on studying these practices, understanding the nature of technology, and exploring various aspects of service properly.

CHAPTER 4 CREATING VALUE IN RETAIL SERVICE INNOVATION:

LITERATURE REVIEW

4.1 INTRODUCTION

The chapter continues the discussion about key areas of the literature. It further explains the critical role of technologies for services. Research addressing the role of technologies in the theoretical entity of profiting from technological innovation (PFI) has proliferated in recent years. In parallel, the growing role of technologies within the theory of service-dominant logic (S-D logic) is thriving. However, firms face the difficult task of applying technologies and releasing their value creation potentials for advancing services. While the fit of PFI/S-D logic has been overlooked, insight into the importance of technology within this theoretical interface remains fragile. In this chapter a revised perspective for Teece's works in 1986 and 2006 on the importance of technology in appropriability regimes is offered. This provides a simple understanding of profiting from technologies and delivering value. As a result, the research offers a subset for value creation role of technologies, value appropriation.

Next, the research integrates the revised-PFI framework with the foundations of service-dominant logic (this integration forms the conceptual frameworks of this research, which is later presented in chapter 5). In doing so, the researcher further discusses the critical role of technology for service by explaining its purpose for service firms. Because of adopting the S-D logic perspective, the research offers another subset for value creation role of technologies, value co-creation. Once, the key subsets for value creation of

technology are determined (i.e., value appropriation and value co-creation), the literature about the importance of technology in retail is reviewed. Next, the two subsets of value creation are defined. Finally, for each subgroup, three activities for service firms – consequently for the retailers – are described and explained. Where appropriate, different examples of technologies from the retail sector are provided.

4.2 PROFITING FROM TECHNOLOGICAL INNOVATION

An integral part of this research is to describe the fundamental impacts of technology on advancing services. In doing so, this study attempts to explain why innovating firms obtain economic returns and competitive advantage from service innovation and using technologies. The first step is explaining how businesses can profit from technologies. The research uses the seminal work by Teece (1986) and further developed in 2006 known as “Profiting from Technological Innovation (PFI)”. His framework explains the importance of technology and service for innovating firms (Figure 4.1).

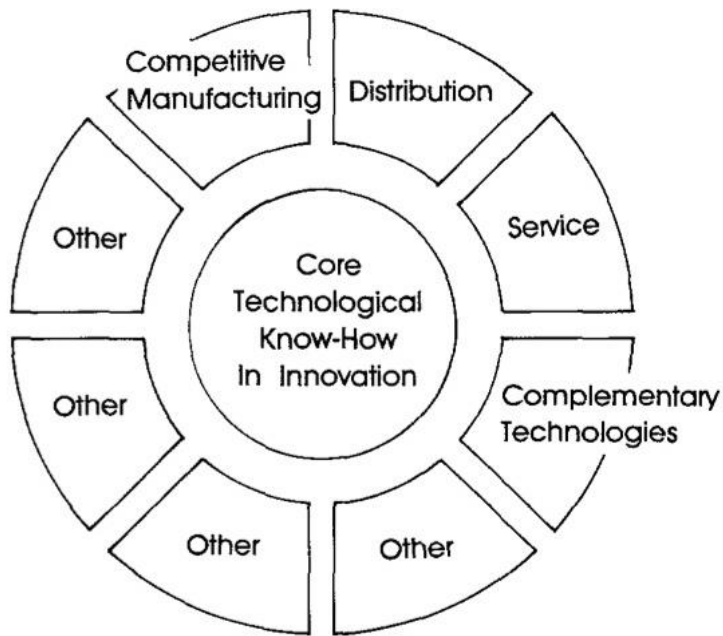


Figure 4-1 Profiting from Technological Innovation (Teece 1986, 2006)

Teece (1986, 2006) demonstrates that when imitation is easy, markets do not work well, and the profits from innovation may accrue to the owners of specific resources, rather than to the developers of the technology. The paper also indicates that innovators with new products and processes, which provide value to different members involved and may sometimes be so ill-positioned in the market that they necessarily will fail. The PFI identifies the factors which determine who wins from innovation: the firm which is first to market, follower firms, or firms that have related capabilities that the innovator needs (Pisano 2006). The follower firms may or may not be imitators in the narrow sense of the term, although they sometimes are (Cooper 2011). The framework appears to have utility in explaining the share of the profits from innovation accruing to the innovator compared to its followers and suppliers. Three fundamental building blocks for innovative firms to

achieve success: the appropriability regime, complementary assets, and the dominant design (technology) (Figure 4.1).

A regime of appropriability refers to the environmental factors, excluding firm and market structure, that govern an innovator's ability to capture the profits generated by innovation (Teece 1986, 2006). The most critical dimensions of such a regime are the nature of the treating technology (also known as dominant design) as a success factor for competitive advantage (Somaya et al. 2011; Teece 2006). While a gross simplification, a dichotomy can be drawn between environments in which the appropriability regime is “tight” (technology is relatively easy to protect) and “weak” (technology is almost impossible to protect) (Teece 1996; Teece et al. 1997). For instance, in retail the examples of the former include the patent and protection for Amazon’s Alexa; an example of the latter would be the Simplex algorithm in linear programming for vendor management or ERP. The PFI framework also makes it abundantly clear that the enterprise’s asset portfolio cannot be managed independent of its business strategy, and that business strategy (Pisano 2006; Pisano and Teece 2007). However, it falls short in explaining the impacts of technology (dominant) on services and managing assets in innovating firms. Although PFI highlighted the role of technology and service in appropriability regimes, it did not fully develop the role of value drivers and processes in the innovation process.

For the application of technologies to generate profits and influence the service innovation process, it must be sold or utilized in some fashion in the market. In almost all cases, the successful commercialization of innovation requires that the know-how in question be utilized in conjunction with other capabilities or assets (Pisano and Teece 2007; Teece 1988). These services are often obtained from complementary assets, which

are specialized. The service it provides is likely to face competition, which will hold down the economic returns on the assets. Owners of such assets cannot expect any particular benefit from innovation unless the innovation increases demand for the services.

The PFI framework highlights that the basis of competition shifts (from product to process) with the emergence of a dominant design (Teece 1986, 2006). At this point, the technology sits at the centre of the framework with services acting as complementary assets (Teece 2003). The framework also offers new insights concerning market entry timing (Teece 2010a). However, it clarifies that for benefiting from technology, a firm does not necessarily have to be a first mover, while paying little attention to innovating services as the primary motive for competitive advantage (Jacobides et al. 2006). A critical observation about Teece's framework is his evaluation of service as a complementary, while many service firms consider the service innovation as the core offering and a key driver of business model innovation and competitive advantage. Further, unlike his assumption for manufacturing firms, the emergence of a dominant design, acts as a complementary asset to also support and develop the service innovation activities. This research proposes the opposite direction, as for service firms, although the assets and technologies are specialized, they are more likely to be duplicated by other actors. Unlike Teece, this research observes that the competition in a service ecosystem results to the application of complementary assets as technologies (see Figure 4.2). Further, in contrast to his framework, innovating services through proper management of additional assets and use of technology sits at the core of a firm's business strategy.

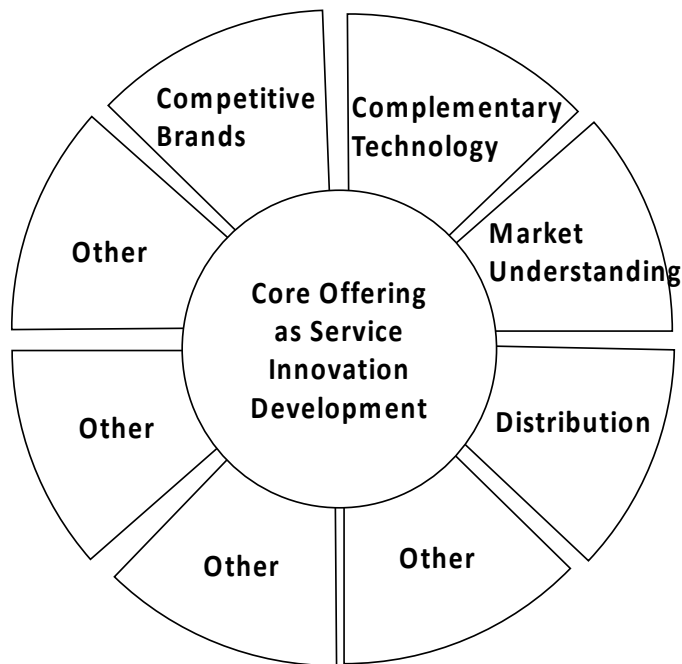


Figure 4-2 Revised-PFI, Profiting from Service Innovation (developed by the author)

4.2.1 VALUE APPROPRIATION AND VALUE CREATION

Teece uncovered some of how properly managing the assets and the technology in appropriability regimes could lead to creating benefit for the firm in forms of value (Jacobides et al. 2006; Teece 2000). He explained how the value creation in combination with appropriability regimes, determines who will capture the fruits of an innovative effort. His discussion of offered the perspective that in appropriability regimes, a firm can appropriate and create value by increasing the distribution of return when an innovation comes to market. His discussion focuses on the lesser importance of service for the technology (Pisano and Teece 2007). As a result, offering a dyad network of relationships between appropriation and creation of value can result in competitive advantage for a firm (Jacobides et al. 2006).

In this research it is observed that by focusing on the importance of service in appropriability regimes, the key to competitive advantage and profiting from service innovation is not just bilateral. Considering the growing importance of service innovation as the core offering of a firm, the understanding of how firms can profit from innovation can be enhanced once the focus is shifted from the dyad to industry-wide networks of value relationships. This network of value relationship consists of i) value appropriation (as suggested by Teece), ii) value creation (as suggested by Teece), and iii) value co-creation (through considering service innovation as the core offering of a firm).

Why this focus? First, a firm trying to achieve competitive advantage qualifies to participate in the value creation activity (i.e., who can do what). Second, having a competitive advantage implies that a firm and its partner need to continually create the value and improve, which highlights the value appropriation activities (who can help and develop). Finally, considering service innovation as the core offering implies that the consumer gets a share of the value network and can further improve it, which highlights the value co-creation activities (i.e., who can improve it by using it). Strangely enough, research on innovation and surplus division has rarely focused on co-specialized relations beyond the dyad (Jacobides 2005; Jacobides et al. 2006; Teece 2009).

4.3 SERVICE-DOMINANT LOGIC PHENOMENA

Marketing has moved from a goods-dominant view, in which tangible output and discrete transactions were central, to a service-dominant perspective, in which intangibility, exchange processes, and relationships are fundamental (Vargo and Lusch 2004a). It is worthwhile to note that the service-centered view should not be equated with (1) the

restricted, traditional conceptualizations that often treat services as a residual (that which is not a tangible good); (2) something offered to support a product (value-added services); or (3) what have become classified as services industries, such as health care, government, and education (Vargo and Lusch 2004b, 2008b, 2008c). Instead, services are defined as the application of specialized competencies (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself (Vargo and Lusch 2004a).

Vargo and Lusch's (2004a) seminal article in the *Journal of Marketing* (Figure 4.3) started an evolving service perspective about the notion of value and the role of actors. It primarily did three related things: (1) identify an apparent trend in mainstream marketing thought, away from a principal focus on outputs (e.g., products) to processes (e.g., service provision, value creation); (2) identify commensurate commonalities in a number of diverse research streams and sub-disciplines (e.g., service marketing and business-to-business marketing); and (3) identify and advance a convergence of these events on a shift from emphasizing production to emphasizing value (co) creation (Vargo and Lusch 2004a, 2008b, 2011, 2016, 2017). Its focus was relatively micro-level (i.e., firm-customer) and managerial. However, the process of zooming out to a broader perspective on value creation and co-creation began almost immediately, with the move from a dyadic orientation toward a network orientation (e.g., Lusch and Vargo 2006; Vargo and Lusch 2008a). At the same time, often through the initiation of other interested scholars, S-D logic has been connected to other research streams, service science (e.g., Maglio and Spohrer 2008) and even as the managerial implications, which were explored by Vargo

and Lusch and others (e.g., Bettencourt et al. 2014; Brodie et al. 2011; Lusch and Vargo 2014).

Foundational Premise	2004	2008	Update
FP1	The application of specialized skills and knowledge is the fundamental unit of exchange.	Service is the fundamental basis of exchange	No Change AXIOM STATUS
FP2	Indirect exchange masks the fundamental unit of exchange.	Indirect exchange masks the fundamental basis of exchange.	No Change
FP3	Goods are distribution mechanisms for service provision.	No Change	No Change
FP4	Knowledge is the fundamental source of competitive advantage.	Operant resources are the fundamental source of competitive advantage.	Operant resources are the fundamental source of strategic benefit.
FP5	All economies are service economies.	No Change	No Change
FP6	The customer is always the co-producer.	The customer is always a co-creator of value.	Value is cocreated by multiple actors, always including the beneficiary. AXIOM STATUS
FP7	The enterprise can only make value propositions.	The enterprise cannot deliver value, but only offer value propositions.	Actors cannot deliver value but can participate in the creation and offering of value propositions.
FP8	Service-centered view is customer oriented and relational.	A service-centered view is inherently customer oriented and relational.	A service-centered view is inherently beneficiary oriented and relational.
FP9		All social and economic actors are resource integrators.	No change AXIOM STATUS
FP10		Value is always uniquely and phenomenologically determined by the beneficiary.	No change AXIOM STATUS
FP11			New Value cocreation is coordinated through actor-generated institutions and institutional arrangements. AXIOM STATUS

Figure 4-3 Latest Update of Service-Dominant Logic Axioms (Vargo and Lusch 2016)

While the foundational premises initially introduced in the *Journal of Marketing* have continuously been updated and modified, they imply a network structure for value creation and co-creation alongside a network of activities and operations (Vargo and Lusch 2004a, 2008b, 2016). This network captures the vital role of value in different form in a service network involving different members (Vargo and Lusch 2011). Further, they all require a move from a single-minded concern with restricted, pre-designated roles of producers, consumers, firms, and customers to more generic actors—that is, to an actor-to-actor (A2A) orientation (Vargo and Lusch 2016, 2017) (Figure 4.3). This was a subtle distinction with broad-ranging implications because it signalled that all actors

fundamentally do the same things: integrate resources and engage in service exchange, all in the process of delivering value in different forms (Lusch et al. 2014; Vargo and Lusch 2011, 2014).

The S-D logic literature identifies the exemplar of the A2A orientation as business-to-business (B2B), rather than the traditional business-to-consumer (B2C) orientation of mainstream marketing (Vargo and Lusch 2011, 2016). This is because, as in B2B, there are no strictly producers or consumers but, preferably, all actors are enterprises (of varying sizes, from individuals to large firms), engaged in the process of benefiting their existence (Vargo and Lusch 2008a). This notion primarily happens through helping the presence of other enterprises—that is, through service-for-service exchange—either directly or indirectly, through the provision of some output (e.g., a good) (Vargo 2009a, 2011; Vargo and Lusch 2014). The A2A orientation also implies several other things. First, it confirms that value creation takes place in networks since it implies that the resources used in service provision typically, at least in part, come from other actors (Lusch and Vargo 2012; Lusch et al. 2008). Second, it implies a dynamic component to these networks, since each integration or application of resources (i.e., service) changes the nature of the network in some way (Vargo et al. 2015; Vargo and Akaka 2012). This, in turn, suggests that a network understanding alone is inadequate and that a more dynamic system of delivering value in multiple orientations is necessary (Chandler and Vargo 2011). Third, though perhaps less apparent, along with the active systems orientation, it suggests the existence of mechanisms to facilitate all of this resource integration and service exchange through the coordination of actors (Vargo and Lusch 2016).

In this research, the term “actor” refers to any member, who is primarily involved within the process of value delivery. Considering a S-D logic perspective in a retail environment, actor can represent an individual or a large enterprise. To better understand the value creation potential of technology for advancing service in a B2B retail environment, there is a need to define two terms. First, actors refer to three main forms as i) the retailer, ii) the supplier, and iii) the customer. In a retail environment, the ultimate objective of a retailer is to benefit from technology for its service innovation. As such, a retailer can co-create value through cooperation with its customers and appropriate value through cooperation with its suppliers.

Second, to understand the value creation role of technology for advancing service in retail, this research defines the concept as “technology value-creation”. While the impact of technology on service is evident within the service management literature, exploring how technology can create value requires further attention. In doing, *technology value-creation* refers to understanding and capturing the value creation potentials of technology for advancing services in retail.

4.3.1 RETHINKING VALUE CREATION AND VALUE CO-CREATION: SERVICE-DOMINANT LOGIC

The S-D logic view of service exchange and delivering value in different types fundamentally challenges the foundation of economics (see Vargo and Lusch 2004a, 2008c). As noted, in the good dominant logic view, the purpose of the economic exchange is to make and distribute things to be sold. A firm’s production process, which may include resources from other companies, embeds value or utility into a good, and the value of the good is represented by the market price or what the consumer is willing to pay (Vargo and

Lusch 2014). This perspective highlights the fundamental notion of value creation. From this perspective, maximum efficiency – and maximum profit – is achieved by standardization and economies of scale (Lusch et al. 2014). The S-D logic view is that all exchange is based on service, and that “when goods are involved, they are tools for the delivery and application of resources” (Lusch and Vargo 2006). For S-D logic, value results from the useful application of resources in forms of technologies, which are sometimes transmitted through knowledge and skills (Vargo and Lusch 2004a). Thus, from this view, the value is co-created through the combined efforts of firms, employees, customers, stockholders, government agencies, and other entities related to any given interactions, but is always determined by the beneficiary (e.g., customer) (Vargo and Lusch 2016).

The S-D logic notion of value co-creation suggests that “there is no value until an offering is used – experience and perception are essential to value determination” (Lusch and Vargo 2014, p. 44). That is, offerings must be integrated with other market-facing (i.e., from other firms) and non-market-facing (e.g., personal/private and public) resources for value to be created – as in the example of a car gaining its value only through the combination of the manufacturer’s production processes (including its supply chain and other market-facing elements) and the customer’s private (e.g., driving skills) and public (e.g., roadways) resources (Vargo et al. 2008). The firm’s roles in value creation, the proposition of value and provision of service, are intermediary to the value co-creation process. Value propositions establish connections and relationships among service systems (Vargo et al. 2015). In value co-creation, the value is ultimately derived with the participation of and determined by, the beneficiary (often, the customer) through use

(often called “consumption”) (Vargo et al. 2008). Here, value-in-use (value co-creation) sits at the centre stage of a complex value-creation process.

4.4 PROFITING FROM SERVICE INNOVATION: A SERVICE DOMINANT LOGIC PERSPECTIVE

The service innovation and marketing literature have underlined the role of technology as a key source of delivering value and return on investment within different service domains. On the one hand, within innovation literature, the distribution of returns among key members takes place as the nature of knowledge influences appropriability network of activities, resource integrators, and technology acceptance (Pisano 2006; Teece 1986). On the other hand, marketing literature views technology as the co-creation of value that leads to the integration of resources and interconnections among actors (Breidbach and Maglio 2016; Vargo and Lusch 2011). Further, in service environment, technology is driven by arranged activities, which are the result of co-creation and creation of value by actors and the integration of resources (Edvardsson et al. 2014; Vargo et al. 2015). These considerations of technology and its value drivers highlight the need for an understanding of value drivers in appropriability or service network of activities. It further requires a deeper understanding of the role of traditional institutions as well as technology to accelerate the integration of resources through different forms of value as well (Vargo and Akaka 2012; Vargo and Lusch 2017).

The understanding of a service environment underlines innovation as co-creational and the result of an ongoing process where the value is created continuously (Frow et al. 2014; Vargo et al. 2008). It also considers new or improved technologies as the result of

structured practices among actors (Akaka and Vargo 2014). While this perspective views technology as a critical part of the development of a service, it implies service as a beneficiary part of the value network. This beneficiary element can then be applied to the central exchange process accordingly (Lusch and Nambisan 2015). It also considers service innovation as primarily centred on technological advances and influenced by the market norms as institutions. Meanwhile, Teece (1986, 2006) further builds on this point by considering the role of service and technology as complementary assets in appropriability network of activities. This further raises the question that in service environment of actors and operations - where technology plays a dominant role and results in changes to the firm's business model (Wieland et al. 2017) - how can technologies accurately deliver value in multidimensional views if it is not co-creation only?

In contrast to Teece's (1986, 2006) proposition by considering technology as complementary, in a service network of actors and institutions, where the primary focus is on designing new services or development of the existing ones, technology is perceived as the key creator of value in multiple forms known as appropriation and co-creation. While Teece (1986) and Pisano & Teece (2007) propose that creation of value occurs in appropriability regimes with operations alongside firms and its partners, the service environment perspective implicitly considers the value creation process of technology as an ongoing co-creational routine. Through the integration of these perspectives the research perceives that in a service environment involving actors, cognitive frames (i.e., institutional arrangements), and institutions, the value co-creation role of technologies is considered as a subset of value creation, only if it is enriched with the appropriation of value. In this view, value creation comprises two key premises as appropriation and co-

creation alongside technologies. Here, technology has a mutual relationship with the institutional arrangements as they both complement each other.

Therefore, as a technology is implemented and then applied as an outcome, it takes on new norms and practices while revising and modifying the institutions interchangeably. Akaka & Vargo (2014) define technology as: “a combination of practices, processes and symbols that fulfil a human purpose”. With this definition of technology, it represents the outcome and the origin of institutional arrangements. These institutional arrangements integrate dynamic resources in either form of a core or complementary and create the institutions that can profit from technological innovations.

For instance, the emergence of new forms of checkout experience and payment systems in service environments such as retail highlights the dichotomy of this process. As a request for efficient and effective operations, self-service checkout machines have been designed. However, they are surrounded with contradictions and conflicts (e.g., the need for faster operations and payment methods against the necessity of human interactions for some offerings). Through the development and use of these freshly designed technological platforms, multiple actors including the firm, the supplier, and the customer participated in the development of the existing institutions as well as framing new practices. Whereas some customers use traditional cash or chip & pin payments and use vouchers, others keep up with the latest trends by using Apple Pay and loyalty cards. Thus, while the technologies are derived from the demand for efficiency, they further construct new institutions as well.

4.5 TECHNOLOGY IN THE RETAIL LITERATURE

Before continuing the discussion and explaining the key elements for each driver of value, there is a need to review the literature of service and technology application in retail. To conduct the literature review of this research, the researcher followed a multistep process. First, the researcher looked for articles published in leading academic and practitioner-oriented management journals during the period of January 1980 to December 2016. A manual search for the following marketing, innovation, and management journals according to the latest version of ABS ranking (Association of Business Schools 2015) was conducted: *Journal of Consumer Psychology*, *Journal of Consumer Research*, *Journal of Marketing*, *Journal of Marketing Research*, *Marketing Science*, *International Journal of Research In Marketing*, *Journal of Retailing*, *Journal of The Academy of Marketing Science*, *European Journal of Marketing*, *Marketing Theory*, *Industrial Marketing Management*, *Journal of Business Research*, *Journal of Product Innovation Management*, *Research Policy*, *R&D Management*, *Technological Forecasting and Social Change*, *Technovation*, *Journal of Service Research*, *Harvard Business Review*, *MIS Quarterly*, *California Management Review*, *MIT Sloan Management Review*, *Strategic Management Journal*, and *Long Range Planning*.

Second, to extend the examination, the researcher looked into the EBSCO Business Source Complete database as a starting point (see Johne and Storey 1998; Snyder et al. 2016). This database includes represents one of the most complete sources on business studies. The researcher explored the database for academic articles published from January 1980 to December 2016 containing the terms service innovation, technology and retail in the

title, abstract, or keywords. An initial cursory analysis of these articles, performed by reading article titles, journal names, abstracts, and introductions, revealed that not all the articles identified by the search would be useful for writing this review. Many of these articles were case studies, summaries of articles published elsewhere, or studies in which the importance of technology for advancing services in retail is not really the subject of the analysis.

Third, database searches were conducted in JSTOR, ScienceDirect, WileyOnlineLibrary, Sage, EmeraldInsight, TandFOnline, and Web of Science were conducted using key terms as stated above. Fourth, for a paper to be included in review, it must deal with the service concept in a nontrivial and nonmarginal way. Second, an article also must refer to the service innovation as a concept related to business firms (as opposed to, e.g., economic cycles or service design). Finally, the researcher also found working papers that the existing literature review had failed to reveal, some of which were subsequently published and are included in the Reference list. Moreover, our careful reading of these articles also allowed us to exclude studies in which the field of technology in retail was treated in a rather marginal or trivial way.

4.5.1 UNDERSTANDING THE RETAIL LITERATURE

The retailing market is experiencing an intense level of change. Firstly, with many of the large retailers selling similar products and services, there is a high level of price competition (Cho 2014; Grewal et al. 2011). Dekimpe et al. (2011) and Simms and Trott (2010) state that some retailers have begun to compete by building new assortments focused around products that are unique, inimitable and which deliver a clear value

proposition to customers such as high and low-end brands. It forms a vital activity through which retailers can appropriate value. To build such new assortments, it requires retailers to have a high level of insight into their target customers.

The second fundamental change influencing retailers is the increasing number of channels that consumers use to access and buy different products, as a result of an increased demand for convenience (Montoya-Weiss et al. 2003; Neslin et al. 2006). Kumar et al. (2010) show the way customer interactions with firms can create and co-create value affecting customer's contribution to the firm. In this sense, Van Doorn et al. (2010) also highlights the importance of engaging behaviours, which are behaviours beyond purchase, at different access points in a multichannel retailing environment. This is evident in retailers increasing accessibility by offering the product in multiple locations, thus increasing the convenience of access to products or offering more sales support (e.g., Sainsbury's Local and Morrison's Local in the UK). Meanwhile, research by Collier and Sherrell (2010) and Pauwels and Neslin (2015) suggest that retailers need to utilize technologies when facing this challenge for increased convenience. Many retailers have capitalized on the reduced search costs that the Internet affords while increasing efficiency from warehousing in centralized locations (Burke 2002; Holloway and Beatty 2003). In this regards, more than thirty years ago, English (1985) predicted the movement of the changing structure of marketing channels through the emergence of technologies.

The third change within the retail market is the extensive growth of discounters and wholesalers. These firms have innovated by changing their business models with new suppliers. Specifically, they reduced the depth of assortment and supporting services by a limited range of technologies while utilizing different and mostly unbranded suppliers

(e.g., Lidl and Aldi). The increased competition within the retailing sector has also resulted in a change in the emphasis of retailers' activities. Research has identified that the competition has now moved away from one focused mostly on transactions, where the goal was to sell goods and services to ultimate customers (Kumar et al. 2006; Shankar and Yadav 2011; Westjohn et al. 2009), to one focused on enhancing the customer interactions (Bowen and Schneider 2014; Ganesh et al. 2007). For instance, to enhance customer engagement through interactive behaviours retailers have attempted to improve efficiency by a faster and simpler checkout process which forms part of their value appropriation activities (see Figure 4.1). As a result, Ganesh et al. (2007) highlight the increasing emphasis on the customer interface for retailers suggesting that decisions in their business model should adapt to consumer behaviour. Grewal and Levy (2009) provide different categories with most significant impact in retailing research. They focus on how service providers including retailers, need to optimize their direct interactions with end customers to strengthen their relationships with them. Therefore, a successful business model for the use of smart technologies in retailing focuses not only on what a retailer sells but also more importantly on how the retailer sells.

According to Dabholkar and Bagozzi (2002a) and Fisher and Vaidyanathan (2012), the introduction of new technologies in retail influences both consumers' decision-making and the way in which information is being collected and exchanged. Weijter et al. (2007), Van Beuningen et al. (2009) and Zhu et al. (2007) emphasize the growing use of technologies in retail as it increases the automation of processes for a retailer and enables the firm to effectively manage the development of new services. Aside from benefits and advantages, Cho and Menor (2009) develop a critical encounter for previous service management

insights arguing about multiple operational challenges caused by service transactions for service providers. Meanwhile the development of innovative and superior technologies changes the service appeal, whilst the insight can be used to improve consumers' perception and affect their decision-making process (Dong et al. 2008).

To help the researcher better recognize the contribution and provide clear communication to the reader, the researcher has developed a literature review table describing a summary of the literature and relevant research on the application of technologies for advancing services (see Table 4.2). The majority of the literature considers retail as the proper context for implementing technologies within a service domain. While there is an extensive body of research on the acceptance and application of self-service technologies, to date the prior literature fails to provide a comprehensive roadmap on how to profit from a diverse range of technologies, which have been introduced to advance services properly. This research tries to explore this gap through understanding the value creation potentials of technologies. The figure on relevant literature also helped the authors summarize the field, in which the research is sited. Through creating a literature review table, the researcher was able to evaluate their work while preventing high-level discussions without proper support and provision.

Table 4.1 Summary of the Key Literature

Relevant research on the application of technologies for advancing services				
Authors	Context	Key technology moderators	Research design	Key findings
Burke (2002)	Retail	Online and in-store technologies	National survey of online consumers (n=2120)	Consumers are not interested in technologies unless new technologies can enhance the shopping experience. Applications must be tailored to their unique requirements.
Collier and Sherrell (2010)	Service providers including retailers	Self-service technology (SST)	Online survey (n=1506)	Customers intend to use self-service technology if it provides perceived control. Convenience perceived value of SST depends on trust and speed of transaction.
Dabholkar and Bagozzi (2002a)	Retail (fast-food restaurant)	Self-service technology (SST)	Experimental design, survey among college students (n=392)	Enjoyment of SST is critical if firms want consumers to encounter long waiting lines and crowded conditions causing social anxiety.
Dong et al. (2008)	Service context	Self-service technology (SST)	Qualitative, focus groups, brainstorming and group survey (n=223)	Customer involving in the service recovery process report higher levels of role clarity, perceived value of future co-creation of value, and the satisfaction with the service recovery.
English (1985)	Electronic retailing	Teleshopping, vidoetex, home computer cottage	Conceptual	The emerging forms of electronic technologies are altering marketing channels. Consumers have taken over many of the retailer's activities; retailers have been forced back to the supplier level.
Evanschitzky et al. (2015)	Retail	Self-service technology (SST), personal shopping assistant (PSA)	Questionnaire (n=349)	Perceived ease of use of the device positively impacts continuous use, while consumers' need for interaction in shopping environments reduces the likelihood of continuous use.
Grewal et al. (2011)	Retail	Mobile apps, kiosks, RFID, digital price tag, digital signage, eye tracker	Conceptual	Highlights the technologies that influence retail price and promotion innovations. It categorizes technologies based on three future research areas.

Lee and Grewal (2004)	Online and store-based retailers	New technologies as a whole	Secondary source of data from small to large retailers during 1992-2000 (n= 106)	The adoption of the Internet as a communications channel and new technologies positively influence firm's strategic performance, specifically those with preexisting catalog operations.
Maglio and Spohrer (2008)	Service systems	Technology as an element of service systems	Conceptual	Service systems are value co-creation configurations of people, technology, and value propositions connecting internal and external service systems.
Meuter et al. (2003)	Retail	Self-service technology (SST)	Online survey (n=823)	Consumers with higher levels of technology anxiety (TA) use fewer SSTs and TA is a better predictor of SST usage than are demographic variables. TA influences overall levels of satisfaction and intentions to use the SST again.
Ostrom et al. (2010, 2015)	Retail, service contexts Inc., global, insurance, collaborative, and well-being	Benefiting from technologies as a whole	Online survey, round 1: n=200, round 2: n=330	Multiple priorities of service domain including, strategic, development, execution, design/delivery, value creation, outcome and cross-cutting priorities.
Parasuraman (2000); Parasuraman and Colby (2015)	Business to consumer (B2C) including retail	Technology as a whole	Qualitative interviews (n=1000)	Introduces the technology readiness index (TRI) that firms can use as an understanding of the readiness of customers (both external and internal) to embrace and interact with technology.
Richey et al. (2008)	Retail	Collaborative technology initiatives including, SST, CRM, ECR, GIS/GPS, RFID, TMS, and VMI	Exploratory and survey methods (n=170)	Retail-supplier technology collaborations are vital to the success of the retailer. Utilization of technology in retailer-supplier relationships is more beneficial for the retailer when the retailer possesses the intangible resource of technological readiness.
Sethuraman and Parasuraman (2005)	Retail	SST, RFID, GPS, and biometrics	Conceptual	Many technologies have the potential to both cut the cost of retailer operations and enhance service to customers. Retailers must take a longer-term view about returns on their technology investments.

Van Beuningen et al. (2009)	Retail	Self-service technology (SST)	Questionnaire among business students (n=271)	Consumers use multiple information sources for self-efficacy judgments, which affect service evaluations such as usage intentions through technologies.
Van Riel et al. (2004)	Innovative high technology services	Information and communication technology	Cross sectional online questionnaire (n=251)	An organizational climate favourable to information sharing mediates the positive effects of intelligence gathering with respect to customers and technology.
Vargo et al. (2015)	Service ecosystems	Technology as a whole	Conceptual	A service ecosystems perspective identifies institutionalization as a central process for the innovation of technology and markets. Technological innovation is the combination of useful knowledge enabled by existing and ongoing institutions.
Vize et al. (2013)	Web solution service providers	Technology readiness (TR) and information technology	Online survey (n=133)	Develops a measure of TR in a B2B context; showing the impact of past inexperience, industry trust and switching costs on firms' level of technology readiness to adopt online operations.
Weijters et al. (2007)	Retail	Self-service technology (SST)	Survey (n=709), qualitative interviews (n=30)	Retailers must focus on communicating to the customers by perceived benefits of using, particularly the efficiency. Firms must ensure that the SSTs are easy to use and perform reliably.
Westjohn et al. (2009)	Retail	ATMs, online shopping and self-service checkout	Survey (n=486)	Firms deploying technology should consider the characteristics of their targeted consumers. Multicultural and promotion based consumers create opportunities as they are already predisposed to using technology.
Wieland et al. (2017)	Service ecosystems	Technology as an element of service ecosystems	Conceptual	Provides a unifying framework that can facilitate the investigation of business models. A business model can facilitate value creation and co-creation through technologies and overlapping market practices.
Zhu et al. (2007)	Service context	Airport car rental kiosks	Observation method (n=141)	Firms apply technologies to compete for market attention but fail to consider customers' competence and preferences. Discouraged customers by technologies are also the most active participants in service value co-creation.

4.5.2 VALUE DRIVERS IN RETAIL

Zott and Amit (2011; 2010) and Teece (2010a) have highlighted the importance of conceptualising business models as integrated systems. They characterised design themes to explain the dominant value drivers of these systems. However, they consider little interactions, if any, between technology and its interconnected value chain intermediaries in a B2B setting. They suggest a 'NICE' framework – novelty, lock-in, complementarities, and efficiency – and argue that these themes represent the interactions among the elements of a business model.

These themes are conceptualized mostly from the perspective of manufacturing business models. Furthermore, far less attention, if any, has been paid to the providing a clear perspective about the creation of a system including technology and its value chain agents particularly in a B2B marketing setting. This research tried to conceptualize these themes from the perspective of service firms and their interactions with upstream technology suppliers considering the fundamental role of technology among value chain intermediaries. Meanwhile, for service firms, the important role of the technology supplier, which are often linked to interactions through interlocked delivery processes, cannot be denied (Lilien 2016). So, to explain the impacts of technology for advancing services and designing business models, the conceptualisation of "NICE" in a B2B marketing setting provides two themes known as *value appropriation* and *value co-creation*. The two themes are explained and developed as below, while they create the foundations of the typology of technology spectrum in chapters 8 and 9.

This research defines value creation in retail within two subsets: *value appropriation* and *value co-creation*. These are placed on each side of the process of service offering in the conceptual frameworks presented in chapter 5. The research then discusses the different elements for each type of value and gives examples in retail. For each aspect of value, the framework breaks it down into three types, which are defined below. This research also defines value as the extent to which a service – in an open and dynamic service ecosystem of activities – is perceived by all the actors to meet their needs or wants. Blocker and Barrios (2015), Teece (2010a) and Vargo and Lusch (2008a) all argue that value commonly depends more on the actor's perception of the worth of the service they receive or offer.

4.5.3 VALUE APPROPRIATION ACTIVITIES IN RETAIL

Teece et al. (1997) and Pisano and Teece (2007) highlight the role of firm's resources and complementary assets, where the core technology is positioned at the centre of appropriability regimes. In which case, there is a requirement for further development or commercialization of complementary assets. This research provides a revised perspective and suggests that in a service-to-service context (as in retail) involving different actors, service offering sits as the basis of appropriability regimes. Teece (2006) considers technologies as complementary, while this research perceives them as the core offering and in some cases the sole solution to benefit from service innovation. Further development of a service through value co-creation and application of technologies becomes an essential complementary asset for appropriability regimes. Contrasting with Teece's propositions, after the emergence of a core and dominant service as a way of appropriating value, the firm is responsible for identifying critical complementary assets in different forms to reveal the value creation potential of technology application.

To suitably appropriate value from complementary assets in the form of services and technologies as the core offering, this research defines value appropriation as a process, in which a firm firstly compete against other firms in a service ecosystem to create new services as key assets. Secondly, the company and its partners (e.g., suppliers) compete to improve and develop new services to increase value for themselves by benefiting from the application of technologies. Hence, in a service ecosystem (e.g., retail) value appropriation consists of three major elements namely: i). Operational efficiency, ii). Operational effectiveness and iii). Customer lock-in. These three aspects form key parts of the conceptual frameworks on how technologies can appropriate value for the firm and its partners.

4.5.3.1 OPERATIONAL EFFICIENCY

Refers to doing firm's activities cheaper and faster. New technology combinations provide firms with the opportunity to develop new services in a way that lowers the use of resources and cost of operations (Cho and Menor 2012; Weijters et al. 2007). Retailers can improve operational efficiency by the effective management of inventory for multiple channels. For instance, in the UK some retailers such as Tesco and Asda have introduced 'dark stores' as a solution for warehousing, which is specially designed for online orders. The dark stores provide retailers with a better stock accuracy and more efficient order processing. Also, many retailers have begun to use supply chain technologies, such as RFID to improve their efficiency and financial performance (Burke 2002; Oh et al. 2012). Retailers have been improving operational efficiency by offering a faster checkout experience, utilizing a range of new customer-focused technologies including vending machines, self-service checkout, scan as you shop, and high-tech checkout systems. They

offer new services for customer access points, such as one-hour delivery or “click and collect”. These retailing activities highlight the importance of checkout experience as well as the access point to improve efficiency.

The appropriation of value for service firms is built on the capability to use smart technologies for service development to improve speed and costs. This integration enables the firm to offer customized processes while increasing operational efficiency. The challenge of improving operational efficiency while improving different steps of the service execution is increasing in complexity (Murray et al. 2010). While retailers try to utilize new technologies to improve and develop their services, they implement technologies based on their ability to deliver improvements in two areas. Firstly, to improve the efficiency of different activities such as streamlining backend operation; optimizing store layout and merchandising display (Sorescu et al. 2011). Secondly, to benefit the development of efficient and interactive relationships with suppliers at the same time (Vanpoucke et al. 2014).

Once the competition is shifted to services, firms try to find practices that result in successful implementation of services by releasing the value potentials of technologies (Chesbrough 2010; Ostrom et al. 2010). Retailers are increasingly aware of the need to improve customer interactions at each stage of the service delivery, which leads them to evaluate a broader portfolio of technologies (Lee and Grewal 2004). Therefore, positioning technology implementation at the core of the service platform provides the opportunity to develop new or improve current services while enhancing the relationship with technology suppliers (O’Cass and Ngo 2012), and efficient use of core and complementary assets (Pisano and Teece 2007).

4.5.3.2 OPERATIONAL EFFECTIVENESS

Refers to doing the right thing by proper use of resources as in core capabilities or complementary holdings as in core capabilities or complementary assets (Sorescu et al. 2011; Teece 2006). Appropriate use of organizational resources reflects the real value, which the provider intends to deliver (Vargo and Lusch 2008c). Retailers are increasing the number of convenience stores or “click and collect” to provide better access points, which is the result of increasing demand for easier access to purchased items at the desired time slot as well as the growth of unplanned shopping behaviour. Further, firms use the knowledge of the products sold in large or “brick and mortar” stores to provide operational effectiveness (Mahar et al. 2014). For example, they only offer a specific limited range of product assortments in physical stores. Because of operational effectiveness and understanding customer demand, some retailers have reduced the number of product assortments they offer to simplify and increase the speed of the shopping experience. Also, innovation in retail pricing and promotions gives retailers the opportunity to improve effectiveness in the form of in-store merchandising (Grewal et al. 2011). For instance, retailers can grow margins for the same shopping basket of goods purchased in their convenience stores.

For service firms, operational efficiency and effectiveness are distinctive practices that result in a higher appropriation of value. The extent to which resources are utilized is an important indicator of effective appropriation of value within each stage of the service delivery. Firms can utilize the implementation of technologies considering different stages of a service design with the aim of improving operational effectiveness, which can in turn form a catalyst for a host of key improvements within the firm (Bettencourt et al. 2014a).

Retailers can increase operational effectiveness by identifying ways through which they can work more effectively with suppliers to enhance service quality (Richey et al. 2008). Retailers can, therefore, increase appropriation through leveraging technologies that improve supplier support processes. Thus, building and developing relationships between the retailer and supplier can create improved interactions and subsequently the effectiveness of activities (O’Cass and Carlson 2012; Wagner et al. 2010). One practice through which retailers improve operational effectiveness is through the matching of product assortment with different market segments (Shankar et al. 2011). Further, multichannel retailers apply technologies, which can simultaneously synergize product assortments among marketing channels. Hence retailers seek technologies that facilitate them in responding to changes in the demand faster than manufacturers.

4.5.3.3 CUSTOMER LOCK-IN

Refers to customer’s desire to switch to another firm or return to the same business (Zauberman 2003). In an open service environment, it has been formed as membership or subscription to different services (Murray and Häubl 2007). Retailers offer new services in multiple forms, as a result of understanding customer need and providing lock-in. Examples of new services, which hold the potential for lock-in, include innovation in product offerings in the forms of pricing strategies. Meanwhile, the introduction of private brands with a variety of product assortments is the result of retailer’s attempt to achieve customer lock-in. Retailers offer a monthly subscription to their services such as next day delivery or click and collect for more comfortable access points. They have also been trying to use new technologies to make shopping experience pleasant and prevent their customers from switching to competitors (Cho 2014).

It is useful to reflect lock-in and the prospect of switching to a broader perspective of loyalty (Johnson et al. 2003). The relationship between the retailer and supplier benefits from the exchange of information, and where technologies benefit this information exchange lock-in can be further increased. Thus, where technologies directly or ultimately improve the internal and external activities of the retailer, they hold the potential to appropriate value and improve the service quality. In retail, lock-in has traditionally been introduced as offering customer subscriptions, as well as through constant improvement of understanding desired product assortment (Sorescu et al. 2011). In this sense, retailers implement technologies that enrich their information database and result in designing a better service fit. They have also sought technologies that provide a higher level of interactive engagement. Meanwhile, retailers primarily consider technologies that can improve the service pay off over long run (Kleijnen et al. 2007). In this sense, the implementation of technologies provides in-advance understanding for the consequence of customer lock-in while locating the best alternative service (Murray and Häubl 2007).

4.5.4 VALUE CO-CREATION ACTIVITIES IN RETAIL

The service marketing literature has identified numerous perspectives for the terms value creation and co-creation. Considering the impact of service actors, technologies and overlapping market practices for a service strategy (Wieland et al. 2017), the framework builds on the improved foundational premises by Vargo and Lusch (2016) through introduction of actors and institutions while highlighting the role of the customer as the key beneficiary of value co-creation. The S-D logic highly focuses on the idea of exchange in a service environment through the application of resources, which can be beneficial for involved actors (Vargo 2009a; Vargo and Lusch 2008a). In a service ecosystem, where a

single service is at the heart of attention, the focus shifts to the processes, rules and patterns. This research argues that the firm gets an opportunity to impact the customer's usage process through application of technologies. Through assessing processes during the implementation stage, the company decides whether the technologies have enough potential to create the desired value or not. Therefore, the firm's desire to persuade, decide, implement and adopt or reject a technology results in creation of value. Meanwhile, the usage at the same time provides the opportunity for the customer to participate in firm's value-creating process, which makes the customer as the co-creator in this exchange.

Value creation does not happen solely between a firm and its customers but instead in an open model involving multiple actors. Technologies neither individually nor bilaterally create value, but rather through implementation and exchange of firm's core capabilities and complementary resources. The exchange among multiple actors makes it conceptualized as value co-creation (Vargo et al. 2008). Further, as a result of technology application, particularly in a digital and virtual world, direct and face-to-face interactions (Gronroos and Voima 2013) rarely happen, which pushes co-creation away from the firm and close to the customer. Therefore, unlike some theorization on co-creation, which limits the perception to face-to-face interactions between two entities (Grönroos 2011), this research takes a broader view as in Vargo and Lusch (2016) to perceive co-creation as a reciprocal process with the customer as the key co-creator of value. Therefore, value co-creation can be defined as the practices of improving and developing the situation of an actor (i.e., customer) and service outcome as an objective. In this research, value co-

creation consists of three major elements known as i). Customer engagement, ii). Customer preference and iii). Channel evaluation.

4.5.4.1 CUSTOMER ENGAGEMENT

There has been quite some theorization on customer engagement (CE) with special issues addressing this concept in leading journals including, the *Journal of Service Research* (2010, 2011) and *Journal of the Academy of Marketing Science* (2017). However, in-depth exploration of different dimensions of customer engagement is beyond the scale of this research and falls short about the application of technologies and its value creation potentials. Therefore, this research tries to provide a clear understanding of how it perceives CE by using a brief review of the key works, which relate to the role of technologies. The seminal work by Brodie et al. (2011) highlights the diversity of engagement concept across a range multiple disciplines. Their work provides an understanding of the three dimensions of CE as cognitive, emotional and behavioural identifying the CE concept as multidimensional. A broader perspective of engagement processes highlights the importance of specific interactions between a central focus (e.g., customer) and a definite entity (object). The specific body can take various forms from service exchange and institutions (Chandler and Lusch 2014; Vargo 2009a) to a firm and brand (Hollebeek 2011; Venkatesan 2017).

Considering 1) a revised perspective of PFI and the critical role of technologies; 2) five fundamental propositions on CE proposed by Brodie et al. (2011); and 3) the latest integration of S-D logic-informed customer engagement proposed by Hollebeek et al. (2016); the author offers that customer engagement in a service ecosystem (particularly in

retail) represents an interactive set of processes that co-create value within a dynamic practice of service exchange between customer and an object. This interactive process takes place under a specific set of context-dependent circumstances (Brodie et al. 2011; Wieland et al. 2017), firm's business strategies (Pisano 2006; Teece et al. 1997), and institutions (Vargo and Lusch 2016) all as rules of the game.

While the engagement of customers by service providers has been extensively researched (Brodie et al. 2011; Hollebeek et al. 2016), the research proposes a practical view on customer engagement. A practical approach to customer engagement in retail represents an interactive set of actions involving emotions and uniqueness, which co-create value as a result of interactions between the retailer and the customer, either in-store or online. Human interactions (e.g., referrals and providing service feedback) play an essential role in the diffusion and final adoption of technologies for improving services (Barrett et al. 2015). Customers can always co-create value through communication and interactions with the firm, as well as behaviours that happen after the point of purchase (van Doorn et al. 2010). There is a general agreement among sales managers, marketing directors and service researchers that customer interactions can impact the consumer response to a service (Ngo and O'Cass 2013; O'Cass and Ngo 2011). Further customers can co-create value in a non-purchase way including their participation in new service development and providing feedback prior to the adoption stage (Edvardsson et al. 2012).

4.5.4.2 CUSTOMER PREFERENCE

Refers to the extent to which one firm meets the consumer's consumption goals and needs (Emrich et al. 2015). Retailers attempt to introduce new assortments in forms of

high or low-end brands, which can accurately meet consumer demand (Mantrala et al. 2009). Also, the use of technologies, such as loyalty cards, gives retailers the opportunity to understand customer's preference. A principal responsibility of a retailer is to determine the preference to facilitate the value co-creation process performed by the customer. This means retailers effectively face a trade-off among factors such as their market position, supplier's constraints, and consumer's priorities (Kwak et al. 2015). Based on these factors, retailers make vital decision for customer choice planning. These decisions can benefit customers and create value for them as they co-create value through finding and purchasing what they search for.

Creating value by the firm, which facilitates the further co-creation of value by the customer, improves the understanding of consumer preference. This further leads to the retailer providing actual demand from the supplier. Through offering better relationship between the retailer and the supplier, a higher level of appropriation is achieved. Therefore, careful consideration of customer preference (or planning) by the retailer, improves value creation and value co-creation involving all the actors. Meanwhile, clear understanding of the desired preference result to the customer leveraging the value co-creation process; becoming loyal and developing trust towards the retailer. As a result of value creation, some retailers change the SKUs that they offer seasonally or annually (KeyNote 2014). Unnoticeable change of SKUs provides surprising offers for the customers, which result to co-creation of value by the customer through unplanned shopping.

In an attempt to meet consumer demands, retailers implement technologies that offer customers quick access to desired product assortments (Grewal et al. 2011). First, retailers

consider technologies, which improve their understanding of customer preferences alongside simpler supporting process. Second, retailers implement technologies that provide the ease of access to the desired assortments, in-store or online. Through an increased understanding of customer preference and consumption goals, the retailer can facilitate the value co-creation process (Ngo and O’Cass 2013). Thus, customers co-create value through finding and purchasing their favourite product. For instance, the Philips LED indoor positioning technology at Carrefour, enables the customers to find their desired product using their smart devices (Retail Design Expo 2015).

4.5.4.3 CHANNEL EVALUATION

Involves ease of access to products for the customers through different channels to enhance value. Channel evaluation is the combination of activities required for customer’s decision processes including need recognition, search, assessment, purchase and coming back to the store, known as lock-in (Neslin et al. 2006). It is also the result of multichannel retailing and interactions between retailers and customers, through which the aim is to enhance co-creation of value and improve multichannel customer management (Montoya-Weiss et al. 2003; Payne and Frow 2005). In a multichannel environment, retailers have the opportunity to create value by multichannel strategies (based on operational effectiveness or efficiency), access to more customers, and sell more to each of them.

Customer channel evaluation is a key source of value creation and co-creation mainly because multichannel customers tend to co-create value by having higher level of expenditure than single-channel customers (Neslin et al. 2006). In fact, Kumar and

Venkatesan (2005) state that multichannel shoppers purchase more frequently and buy more items per shopping basket than single-channel shoppers, which justifies the role of co-creation by customers. Because of more interaction between the retailer and the customer, retailers can gain a better understanding of customer preferences and provide more accurate demand to the supplier. This leads to a higher level of value appropriation at the same. Significant outcomes of managing customer channel evaluation include increasing industry sales with possible profit for key retailers and developing opportunities for retailers to offer unique selling propositions (Herhausen et al. 2015). The result is the long-term creation, co-creation and appropriation of value through involving loyal customers (customer lock-in), properly implementing multichannel strategies (operational efficiency), and allocation of resources (operational effectiveness).

As customers increasingly use multiple channels this provides higher level of interactions with retailer's innovative services. Thus, channel evaluation represents a vital source of co-creating value when implementing technologies. While customers primarily focus on core aspects of service offerings that are common across channels, retailer's application of technologies can directly impact customer satisfaction in each phase of customer actions. Shopping at multichannel retailers is likely to be challenging for customers as for each step of the shopping process, multichannel options are available (Hammerschmidt et al. 2016). Therefore, customer has to choose the optimal action for each phase while overlooking the comfort provided by technologies in finalizing a purchase (Oh et al. 2012). In such a situation, to minimize frustration and simplify decision-making, customers prefer user-friendly services, which facilitate their co-creation activities.

4.6 CONCLUSION

This chapter provided perceptions of profiting from technological innovations, primarily for service firms (e.g., in retail), with a fundamental focus on value creation of technologies for advancing services. While Teece's PFI is primarily designed for manufacturing firms, it underlines the importance of environments, through which value can be appropriated. But, it comes weak in providing such an approach for innovative service firms considering the vital role of technology. In fact, focusing on value appropriation exceptionally can hinder value creation and its cooperative relationship. Unlike Teece, the understanding of both industry dynamics and how service firms can profit from innovation can be enhanced once the focus is shifted to a bilateral network of interactions comprising two sets of promises, value appropriation and value co-creation.

Meanwhile, research on how services can benefit from technologies have highlighted the importance of technological sophistication for successful service innovation (Barrett et al. 2015; Storey et al. 2016); the essential role of technology within the process of new service development (Biemans et al. 2016); and how both technology and market innovation are shaped by ongoing practices driven by firm value (Dotzel et al. 2013). Despite these contributions, understanding the interactions between technology and firm's practices, which are aimed to deliver value and innovate services, remains complicated and unexplored (Vargo et al. 2015; Witell et al. 2016). As the focus moves away from serving customers to serving complex value networks (Patrício et al. 2011); there remains a gap in service research that explores the value drivers of technology for advancing services within the increasingly competitive service sector.

Furthermore, this chapter advances our understanding about the research gap on how to profit from service innovation through the use of technology, involvement of actors and activities, and considering a S-D logic perspective (Vargo and Lusch 2017; Wieland et al. 2017). The primary objective of this chapter was to provide a clear understanding of the value creation potentials of technologies for advancing services. Contrary to the common claims on benefiting from innovations, technologies do not hold the potential value that can be unlocked for the benefits of services and business models (Teece 2010a; Zott et al. 2011). Instead, value creation of technologies is shaped through service processes and the integration of practices with multiple resources. The processes are ongoing practices that enable and constrain the emergence; become stable over time; and then lead to a network of services and operations, which impacts the distribution of return among key members.

CHAPTER 5 CONCEPTUAL FRAMEWORK DEVELOPMENT

5.1 INTRODUCTION

This chapter presents the key arguments behind the development of the conceptual frameworks in this research. This chapter provides a detailed explanation of the arguments behind these steps. The fundamental question behind the development of the conceptual frameworks is: how does the implementation of technologies for advancing services create value? To answer this question, there is a requirement for understanding the subsets of value creation by technologies. While the application of technologies for advancing services lays its background in different areas of the business literature (Dotzel et al. 2013; Jacobides et al. 2006; Ostrom et al. 2015); there is a gap within service management literature about a theoretical perspective (and further developed empirical advances) that strains the role of technology and its impact on value through integrating key areas (Lusch and Nambisan 2015; Snyder et al. 2016). Also, there remains a need for the conceptual association of important theoretical entities from different areas, which highlight the role of technologies, including “Service-Dominant Logic” (SDL) (Vargo and Lusch 2004a, 2016, 2017) and how to benefit from technology and available firm’s resources including “Profiting from Innovation” (PFI) (Teece 1986, 2006, 2010). Further, little remains known about different practices, in which these seminal theoretical works tie together (e.g., the connection between how to benefit from technologies in PFI and concepts of creation and co-creation in S-D logic). The conceptual frameworks presented in this chapter aim to improve the theoretical knowledge gap as stated above.

5.2 VALUE DRIVERS IN RETAIL

As stated in chapter 1, the first standpoint for developing the conceptual frameworks for this research is to provide a revised perspective for Teece's work in 1986 and further developed in 2006 on how to profit from technological innovation (PFI). The next step is to integrate the revised-PFI framework with the theoretical work known as service dominant logic (S-D logic) to explain the two subsets for the value creation potential of technologies in retail. This research focuses on the implementation stage of the adoption process (Rogers 2003; Venkatesh et al. 2007, 2012). In this stage, firms identify new technologies, through collaboration with business partners including different suppliers, and engage in assessing aspects such as operational, commercial and business considerations (Ordanini and Parasuraman 2010; Richey et al. 2008). This results in a decision to adopt or reject the innovation.

The research proposes that the paradigm of value creation is optimally achieved when its elements are broken down into two key subsets and through a bilateral analysis of their potential to deliver value. Therefore, for this research, value creation is defined within two subsets: value appropriation and value co-creation. These are placed on each side of the process of service offering in the conceptual frameworks (see Figure 5.1). In the framework, while value appropriation (as a subset of value creation) is derived from revisiting the PFI theoretical framework, value co-creation is the result of exploring the theoretical domain of SDL. The research then discusses the different elements for each type of value and gives examples in retail. For each aspect of value, the framework breaks it down into three types, which were defined in chapter 4.

This research also defines value as the extent to which a service – in an open and dynamic service ecosystem of activities – is perceived by all the actors to meet their needs or wants. Blocker and Barrios (2015), Teece (2010a) and Vargo and Lusch (2008b) all argue that value commonly depends more on the actor’s perception of the worth of the service they receive or offer in a service ecosystem. Vargo and Lusch (2011) introduced a service ecosystem as: *“a spontaneously sensing and responding spatial and temporal structure of largely loosely coupled, value-proposing social and economic actors interacting through institutions, technology, and language to (1) co-produce service offerings, (2) engage in mutual service provision, and (3) co-create value”*.

The research argues that the implementation of new technologies provides opportunities for increasing value for all the members involved in this service ecosystem, only if, the co-creation of value is loosely coupled with the appropriation of value to benefit from technology value-creation (i.e., value creation potential of technology). In order to clarify the arguments, there is a need to briefly explain how two different thoughts regarding value creation and co-creation highlight the importance of technology – e.g., Vargo and Lusch (2004a) or outside the S-D logic umbrella Gronroos and Voima (2013) – but each overlook the role of technologies in advancing services and fail to answer the question: How does a firm alongside its partners, in an open set of activities, use technologies to create value if it’s not co-creation? This research revises the PFI framework to propose that the missing piece of this puzzle is value appropriation. The research also highlights the role of value appropriation as a critical division of value creation. It adopts the S-D logic perspective reflecting value co-creation under the umbrella of value creation. Then, it integrates the co-creation perspective as a subset with the revised-PFI perspective and

introduce value appropriation to highlight the importance of technology value-creation in a service ecosystem (Figure 5.1).

First, there is a need to explain the critical paradigm of value and how it is incorporated in here. The service marketing literature has highlighted the role of value extensively (Grönroos 2006; Payne et al. 2008). Meanwhile, the idea of technology application and its potential to create value has not been explicitly defined, whereas many authors with different perspectives delineate the concept of value creation in service non-identically (Gronroos and Voima 2013; Vargo and Lusch 2016). In particular, the S-D logic literature treats the notion of value creation as co-creation implicitly when it comes to the role of firm and its partners; and explicitly when it comes to the role of the customer. In here, value creation and co-creation highlight a set of activities in a service ecosystem involving all the actors including the customer. Further, different authors propose different thoughts on explaining this concept. For instance, the value can be delivered by multiple applications including technology in context (Barrett et al. 2015; Chandler and Vargo 2011), in a social context (Edvardsson et al. 2011) or experience (Brodie et al. 2011; Chandler and Lusch 2014).

Considering the diverse literature of value, it is fair to say that value cannot be created both by the firm and the customer and by the customer alone (Gronroos and Voima 2013). On the one hand, S-D logic considers value creation mostly as co-creation and does not explicitly explain how firms create value mainly involving technologies (Vargo 2009b; Vargo and Lusch 2011). On the other hand, Gronroos and Voima (2013) explain that value should be embedded in-use and in-exchange, but it mostly focuses on value creation as value-in-use highlighting the role of the customer as the sole creator of value. The

research states that value creation should be broken down, whereas value will not be co-created unless it has been already created elsewhere. Therefore, considering the two opposite and critical thoughts in service marketing literature, each fails to highlight the role of technology and demonstrate how value is introduced, conceptualized and delivered through the application of technologies and considering all the key actors. Also, the question remains as: How does a firm alongside its partners, in an open set of activities, use technologies to create value if it is not co-creation? For this research, the research proposes that to have a clear understanding of how value is created considering the certain position of technology, the missing piece of this puzzle is valued appropriation (see Figure 5.1). For this goal, this research envisions by offering a revised perspective on Teece's works in 1986 and 2006 regarding the concept of value in appropriability regimes.

The importance of a relationship between value appropriation and value creation has been identified in a diverse set of areas including strategy (Jacobides et al. 2006; Teece 1986; Zott and Amit 2010), entrepreneurship (Hitt et al. 2011), and marketing (Chandler and Lusch 2014; Sorescu et al. 2011; Vargo and Lusch 2008c). however, considering the role of actors in service ecosystems, this research incorporates value appropriation as a subset of value creation. It highlights the statement by Vargo and Lusch (2006; 2016) as value creation is not the result of activities by a single actor (preferably customer) or in a business-to-consumer context, but among a whole set of actors in a dynamic environment. It proposes that in a service ecosystem of activities, the notion of value creation happens in forms of 1) appropriating value involving the firm and its partners through revisiting the PFI framework (left side of Figure 5.1); and 2) co-creating value involving the customers through incorporating the SDL framework (right side of Figure

5.1). In fact, in a service environment, value appropriation and value co-creation become the key sources of creating value.

In a service environment, where multiple actors engage in regular service offerings, the customer co-creation of value-in-use can be considered as a division of value creation through the use of technologies. As a result, it is suggested that customer has the responsibility for co-creation of value (Vargo and Lusch 2017) while the firm can offer value propositions through the appropriation of value. Thus, in this freely connected structure (i.e., the service environment), co-creation and appropriation matter when two or more parties influence service provision. Within this setting that delivers technology value-creation (i.e., value creation potential of technology) for innovating service, appropriation and co-creation of value do not happen on their own. In fact, they create a highly integrated construct, only as a result of co-specialization. Teece (2009, p. 41) defines co-specialization, as the condition when the value generated by two or more activities used in combination is substantially higher than the value of each theme in its next best use. Therefore, value appropriation and value co-creation represent two sides Figure 5.1 through the incorporation of the revised-PFI and SDL framework.

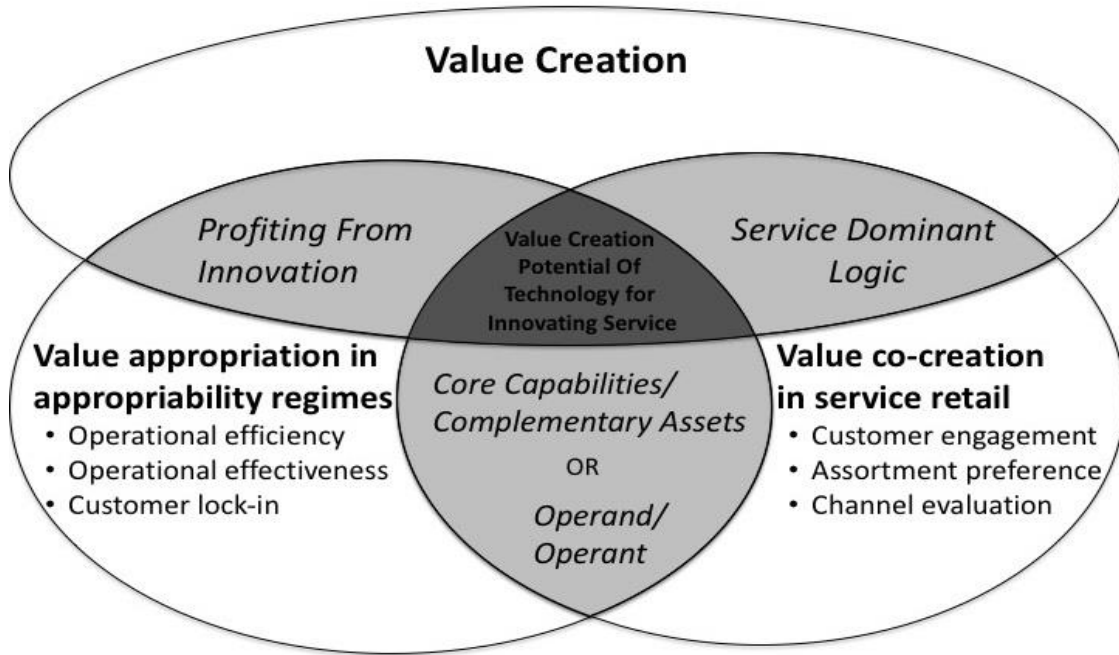


Figure 5-1 Visual Representation for Value Creation Potential of Technologies for Advancing Services

5.3 DEVELOPMENT OF PFI-INFORMED S-D LOGIC

This research proposes two reasons for underlying the development of the conceptual frameworks and the creation of a typology. First, while the S-D logic provides a promising macro foundational theory (study of the behaviour of the whole) within service management and marketing discipline (Lusch et al. 2014); PFI provides a fundamental perspective on how to profit from service and/or product within strategy and innovation literature (Teece 2006; Teece and Pisano 1994). Although both frameworks highlight the role of technologies as a success factor for services implicitly, they fail to explicitly illustrate how individual processes interact within conceptual frameworks thus limiting the knowledge about the vital role of technology for advancing service. Considering the importance of technologies in service domain and three broad areas of management supporting service literature as marketing, innovation and strategy (Figure 5.1), the

conceptual frameworks and typology aim to provide a theoretical contribution by integrating two macro foundational theories (Foss 2009).

Second, on the one hand, service marketing literature and particularly S-D logic highlight the role of technological benefits as resources within different forms, either operand (e.g., equipment) or operant (e.g., knowledge and skills) (Vargo and Lusch 2004a, 2008c). On the other hand, the strategy and innovation literature and notably PFI (highly known as the bridge between these two areas) (Augier and Teece 2008; Teece 2006) highlight the role of technology and acceleration of resources either in the form of dynamic capabilities (firm's infrastructure) or complementary assets (service and distribution). While S-D logic and PFI have been evolving for many years now and given the undeniable impact of technology and resources within different backgrounds of service literature – as the fundamental basis of competitive advantage and firm's profit – offering a bridge between the two seminal works of PFI and S-D logic seems to be of high importance. So, within Figure 5.1, *i*) the left side of the framework highlights the importance of benefiting from technology (through inclusion of the PFI framework), *ii*) the right side highlights the importance of using technology for service (through inclusion of the SDL framework), and *iii*) highlights the importance of benefiting from technology for service whilst facilitating different types of resources (core and complementary as in PFI and operand and operant as in SDL). Hopefully, the framework and the typology can be a good start for linking the three key background areas of service literature together.

5.4 A TRADE-OFF BETWEEN VALUE APPROPRIATION AND VALUE CO-CREATION

In this section, the author explains the research intention to revise Teece's (1986, 2006) work. The section also explains how the outcome of the framework is integrated with S-D logic to propose a conceptual framework for value creation potentials of technologies (i.e., technology value-creation). In the seminal works by Teece (1986, 2006) he explained how different interactions in a mutual network of activities result in sustainable benefits and competitive advantage. In particular, he discussed how activities in value appropriability regimes bond with services and technologies, which lead to the innovative contribution of the firm competing in the long run. His proposed framework known as "Profiting from Technological Innovation" (PFI), suggests that complementary assets and technologies should be thought of a choice variable regarding firm's level of integration. However, it falls short on which technologies to be embedded in the product or service business environment, emphasizing the role of technologies as complementary rather than the critical element to create value profit. It also fails to provide a product/service model comprising different practices within the focal firm, which defines how technology potentials help the firm create value in appropriability regimes.

Where Teece (1986, 1996) highlight the value creation role of innovation in generating new demand for assets as complementary, this research proposes that complementary assets in the form of services create demand for new technologies as core innovations. PFI underlines the importance of a co-specialized framework, through which value can be created, but it comes weak in providing such a service network for adequately delivering value. While it considers technologies as complementary for core and tangible innovation

offering, the investment of service firms including retailers on technologies puts the technology as the core capability with service exchange as the complementary and primary offering. As a result of this argument and to provide operational efficiency to existing services, retailers such as Tesco and Amazon have offered their licensed payment systems known as PayQwip and Amazon Payment.

Teece's discussion highlights the firm's success by creating internal knowledge solely while limiting his perspective to interactions between two key actors with limited flexibility, the firm and the customer (Somaya et al. 2011; Teece 1988). In here, through offering a S-D logic perspective, the research suggests that a service innovator (i.e., the retailer) can work effectively with the idea of cooperating with entities outside the firm involving multiple actors in an open interactive service ecosystem. Teece's critical argument explains how a trade-off between core capabilities and complementary assets leads to a dyad network of operations and activities, which influences the distribution of return among key actors. This research perceives that a trade-off between multiple operations and processes, which deliver competitive advantage for a service innovator, happens within an open arrangement as a service ecosystem.

Service firms such as retailers will capture a better understanding of technology value-creation, innovation capabilities and market tendencies if a two-sided model is viewed as a loose model of service exchange comprising two sets of premises, value appropriation and value co-creation (see Figure 5.1). Meanwhile, Teece (2006) states that once the firm plans to shift the profit to complementary assets, the assets cannot be easily copied while the core product is benefiting from protection. However, in a service ecosystem, the intangibility of service offering makes it be copied effortlessly having less protection and

resulting the firm to be less interested in innovating new services. Contradicting with Teece's perspective, in this ecosystem, technologies as core products do not benefit from protection and can be persuaded merely, implemented, and adopted or rejected.

Furthermore, the destruction and maturity of industries require the business model of a service firm requires them to offer a viable mode of evaluative decisions concerning economic improvement and development of activities (Cusumano et al. 2015). However, with the birth of a new business model, a set of possible networks may start emerging under the same strategic umbrella. Once a model can find its position in a marketplace, it starts stabilizing while key actors begin to shape and get developed (Pisano and Teece 2007). In a service sector, parts of this model begin to unfold through market experience or by coincidence. For service firms, positive feedback in the form of value co-creation and negative feedback from attempting to alternate the new-born set of activities will increase the strength and solidity of the appropriated value from multiple activities (Amit and Zott 2001; Jacobides et al. 2006).

Meanwhile, once the value creation through the application of technology for service is established, it is likely that other firms within the same industry will try to replicate it and become passive users. The impact is when they try to adopt the same model to the extent that elements of value appropriation can be eliminated. For instance, big retailers in the UK – such as Tesco, Sainsbury's, and John Lewis – all have faced innovation challenges recently. This was mainly due to the change in consumers' purchasing habits in support of the new retailing arrangement offered by lower-priced discounters. In the UK, Lidl and Aldi are integral parts of the retail landscape, with people choosing not to trade up to brands such as Tesco and Sainsbury's. So, for service firms planning to benefit from the

implementation of technologies for advancing services considering the role resources (see Figure 5.1), firms face two different challenges: (1) they have to maintain the current arrangement for technology value creation yet as a set of value appropriation exchange that is linked to value co-creation components. (2) They attempt to change their existing model due to the market changes and to impact the delivery of value. Retailers face these challenges as a result of actors' changing habits based on the structure of organizing activities and relationships with their other actors. As opposed to Teece's model, a service innovator has a considerable opportunity to shape the dyad of appropriation and co-creation and through a bilateral analysis of their potential to deliver value.

5.5 INTEGRATION OF THE CONCEPTUAL FRAMEWORK AND IMPLEMENTATION

PROCESS IN RETAIL

After exploring the key foundations of the conceptual development in this research, this section attempts to integrate the fundamentals of the conceptual framework (i.e., understanding the value creation potential of technology for advancing service, see Figure 5.1) with the implementation process in the retail sector. This helps understand the role of technology value-creation and innovating service in retail. As such, the conceptual framework in this section shows the connection among technology value-creation, service innovation development, and the implementation process in retail.

Within the service sector, the value creation is achieved primarily as the result of a bilateral bond between the appropriation and co-creation of value. This dual connection provides the skeleton, which shapes the physique of decisions for the implementation model of new technologies (Figure 5.1). It also highlights the importance of technology

value-creation for innovating services (i.e., service innovation development) particularly in retail. Further exploration of how this dual connection shapes the decision-making while facilitating technology value-creation and service innovation development (see Figure 5.2) is crucial to the conceptual development in this research.

After a model of premises is established and well-organized, at the early stages of the implementation process and because of the retailer and supplier initiative, the retailer and the supplier start collaborating. As such, they will optimize a specific set of practices on either side of appropriation or co-creation very well while being able to advance the remainder of the activities just fine. At this point, the firm is highly capable of accomplishing those selected tasks and is less capable of shifting to other tasks mostly because it is efficient and effective for its chosen few, either appropriation or co-creation.

The destruction and maturity of industries require this decision-making model to offer a viable mode of continuously benefiting from the application of technologies concerning economic improvement and value drivers (Magretta 2002; Palo and Tähtinen 2013). The emergence of this model is particularly due to the initiative provided the retailer and/or the technology supplier. In doing so and after the initial steps of the implementation process, the primary aim of the retailer is to facilitate the service innovation development. Simultaneously, the main objective of the technology supplier is to accelerate the technology value-creation (see Figure 5.2). However, with the birth of a new innovative driver, a set of possible networks may start emerging under the same strategic umbrella. Once a model can find its position in a marketplace, it starts stabilizing while key elements of the institutions – in here elements of the implementation process of technologies – begin to shape and get developed. After the initial steps of the implementation process in

retail, the retailer and the technology supplier bond together (mainly in an actor-to-actor network) to facilitate technology value-creation and service innovation development together (Figure 5.2).

Although successful service firms are in a position to capture the fruit of service innovation and technology value-creation by delivering and creating value due to their economies of scale (Dotzel et al. 2013; Snyder et al. 2016); the degree of adjustment between these two elements (i.e., technology value-creation and service innovation development) remains an issue of significance for them. Therefore, management of the implementation process through technology value-creation and service innovation development can capture financial return mainly for the retailer (Figure 5.2). The benefit is achieved from existing innovation and deliver strength of dynamic capabilities for future implementation of technologies and considering the interactions between technology value-creation and service innovation development.

Facilitating the implementation of technologies in a way that results in the adoption is not an easy task for firms, and it requires continuous collaboration between the retailer and technology supplier in an actor-to-actor network (see Figure 5.2). Such significant change requires the integration of highly specialized level of service exchange and knowledge of technology, which may well disrupt the present interactive and resource integrating systems (Feng et al. 2016; Vargo and Lusch 2014). In doing so, the strategies for technology value-creation and service innovation development during the implementation process in retail, form through a route of trial-and-error practices. As stated before, the practices take place in an actor-to-actor network engaging different

players; with an open service architecture; and mostly beneficial for the retailer through the end of the implementation process (Figure 5.2).

The conceptual framework developed in this section provides a theoretical and practical insight on the practices, initial motives and final beneficiary of the implementation process in retail. Within this process, on the one hand, the retailer must leverage technology value-creation. on the other hand, they are forced to ensure that their existing practices of service innovation development will strengthen their competitive position. This highlights the critical consideration of technology value-creation and service innovation development within the implementation process (Figure 5.2).

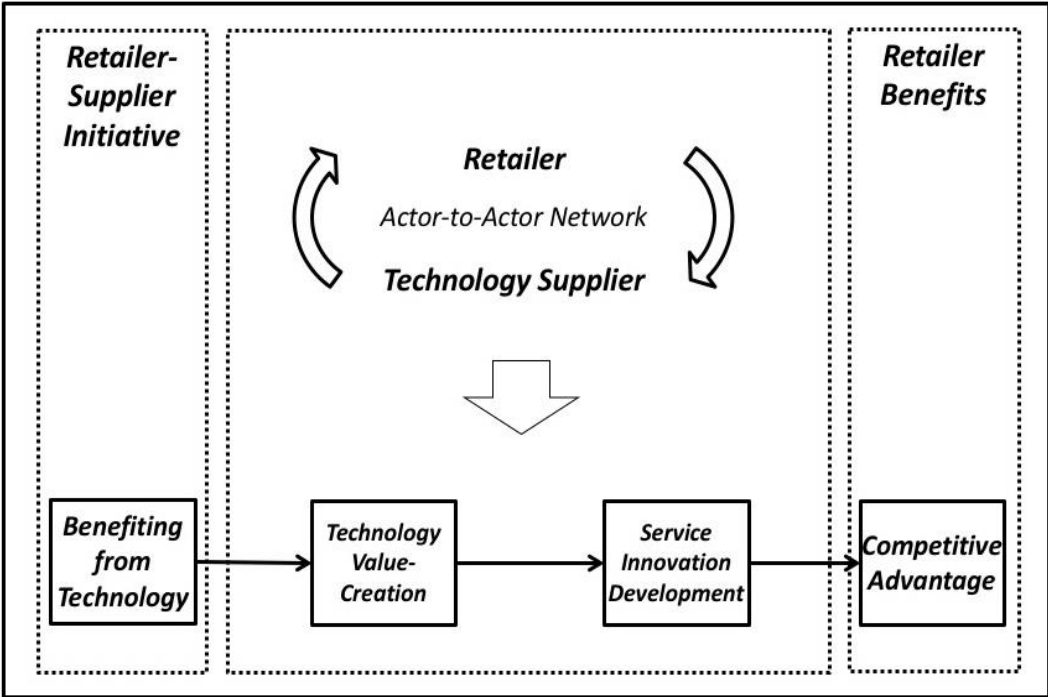


Figure 5-2 Conceptual framework for the technology implementation process in retail

5.6 LINKING TECHNOLOGY, VALUE CREATION, AND SERVICE INNOVATION

After explaining the value creation potential of technology for innovating service during the implementation process in retail (Figure 5.2), there remains a need to understand the important link between technology value-creation and service innovation development deeply. Studying the connection between the two concepts is crucial to the progress and success of the technology implementation process, which may, in fact, lead to adoption.

On the one hand, within the innovation literature, the distribution of return among key members takes place as the knowledge of technology influences the network of activities, how to benefit from different capabilities, and the acceptance of technology (Pisano 2006; Pisano and Teece 2007; Somaya et al. 2011). On the other hand, marketing literature views impact of technology on innovation as an element of delivering value that leads to the integration of resources and the interconnections among actors (Akaka and Vargo 2014; Vargo et al. 2015; Wieland et al. 2017). Despite the considerations of technology and its value delivery, there remains the need for a deeper understanding of the role that technology plays in profiting from service innovation (Barrett et al. 2015; Witell et al. 2016). Further, understanding the connection between how technology creates value and service innovation concept remains essential.

Once the technology is established and built through the interaction between its value drivers, it creates a structure, within which the flow of knowledge emerges and develops (Dusek 2006). The structure of knowledge continually produces itself out of the technology and decides, which platforms in the form of new technology should enter it. The newly-born technology impacts its value drivers and optimizes the interaction

between them differently. This notion highlights the circular causality at work here. Technology creates the structure for the flow of knowledge and awareness, while the structure facilitates the development and creation of novel technology by impacting its value drivers (Arthur 2009). In the short-term plan and considering a manufacturing perspective, the structure appears to be absolute and fixed. However, observing as a service innovator, practices can shape the structure and result in it taking place, interacting, and collapsing back continuously. The circular and evolving interconnection matures and stabilizes in the long reaches of time and through interactions with value appropriation and co-creation; designing of new services; or development of the existing ones. This unique feature of technology represents its nature.

When technology is pushed to deliver more, its value drivers seek out better integration and improved components. Key principles and activities within each value driver (i.e., appropriation and co-creation) explore new connections to compete in the market and profit from service innovation. However, technology can only be pushed for incremental changes so far before it reaches its limitations. Service innovation development can overcome limitations often by replacing the core principle of value appropriation and value co-creation by one that works better. Therefore, multiple connections between the elements of value appropriation and value co-creation impact the nature of technology differently. The affected nature of technology can influence the service innovation development in different ways accordingly (see Figure 5.3). This may be the one that uses a different connection or a sharper usage of the same activity. For instance, in retail, one group of technologies improve the efficiency of activities while engaging customers and providing better shopping experience simultaneously. Here, card or mobile payments

improve the principle of efficiency with different levels of sharpness and pace. However, another group improves efficiency while managing and analysing product information on different channels. So, the basic principle of efficiency for technology is formed through a sharper version of the same connection or within two different connections.

Pursuing new connections or sharper usage of the same activity justifies why technology becomes more complex as it advances (Pinch 2008). The complexity of the nature of technology also has an impact on service innovation development. For instance, contactless payment system has evolved and become more complex over the years by the inclusion of biometrics in its structure. The phenomena follow a natural cycle, where a bilateral relationship between value appropriation and value co-creation establishes the nature of technology and its structure. Once the establishment gets underway, different formats of technology emerge. The technology as an outcome further evolves and improves technology value-creation while inspiring service innovation development (i.e., technology as a modifier). Figure 5.3 highlights this process, where the key elements of technology value-creation (i.e., value appropriation and value co-creation) influence the nature of technology as an outcome. Next, technology evolves and inspires the service innovation as a modifier. The process continues as different forms of connection between value appropriation and value co-creation impact the nature of technology and service innovation development ultimately (see Figure 5.3).

The conceptual framework in this section (Figure 5.3) represents a model for understanding the connection between technology value-creation and service innovation development during the implementation process. It includes three sets of actions as (1) the way the two elements of technology value-creation (i.e., value appropriation and

value co-creation) bond together to impact the nature of technology as an outcome, (2) the nature of technology evolves and inspires the activities of a service firm (i.e., service innovation development) as a modifier, and (3) the continuous evolve of the service innovation development, which may lead to the emergence of new services (see Figure 5.3).

Therefore, to summarize, the fundamental elements, which impact the implementation process of the service firm in general and the retailer in particular, are technology value-creation and service innovation development. As evident in Figure 5.2, the connection between these elements takes place in an actor-to-actor network and between the retailer and the technology supplier. Since technology value-creation highlights a dichotomy comprising value appropriation and value co-creation, in summary, the three elements (i.e., value appropriation, value co-creation, and service innovation development) together capture all the different concepts and issues that underlie the key setting of the conceptual frameworks in this chapter (Figure 5.1, Figure 5.2 and Figure 5.3). As such, Figure 5.3 provides an overview of the connections among these three themes. Further, each of the themes is examined in greater detail highlighting the key definitions and issues (see Table 5.1).

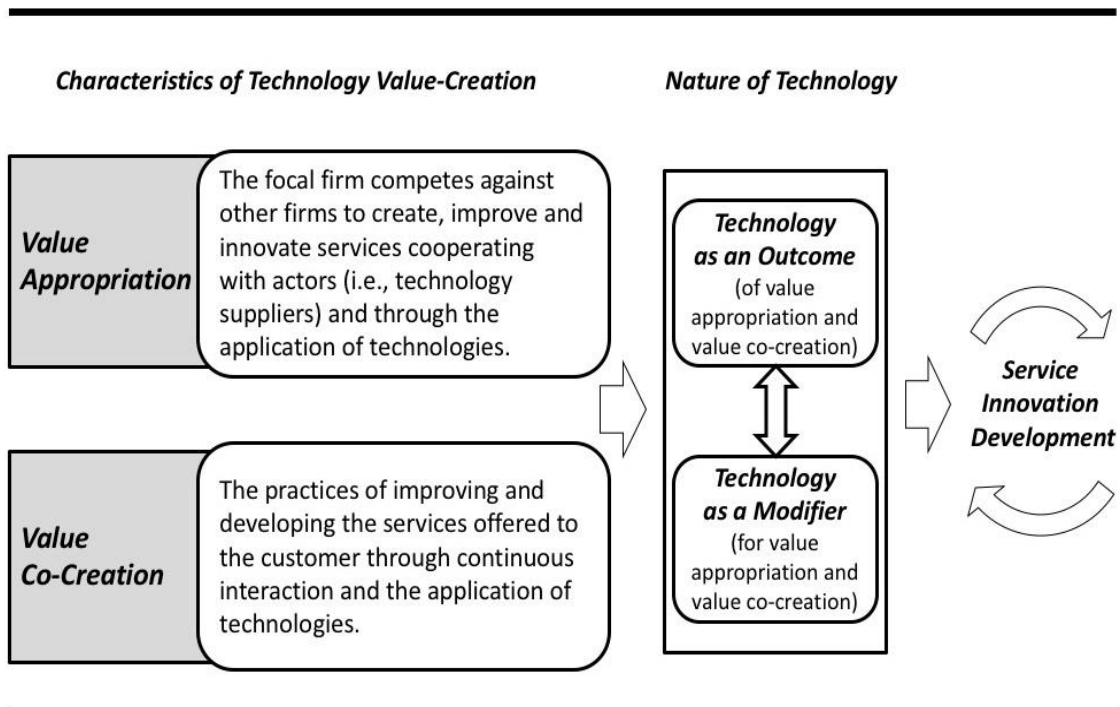


Figure 5-3 Conceptual framework for linking technology value-creation and service innovation development

Table 5.1 Examining the key themes for technology value-creation and service innovation development

Central theme	Definition	Key issues
Service innovation development	practices of improving existing services incrementally, which may in fact lead to the emergence of a new service because of continuous refinement and modification.	<p>Creates the overemphasis on the outcome with little attention paid to the service production process. This can be harmful as it does not create sufficient value for different actors (Ye and Kankanhalli 2018).</p> <p>Value activities and new value creation practices can form novel services with improved effectiveness (Möller et al. 2008). Requires insights and a shared view about the characteristics of service innovation development considering the perspective and benefits of different actors (Lusch and Nambisan 2015). Understanding of how firms create value by combining service innovation development and business model innovation is still incomplete (Möller et al. 2008).</p>
Value appropriation	A firm competes against other firms in a service environment to create new services as key assets. The firm and its partners (i.e., suppliers) compete to improve and innovate new services to increase value for themselves by benefiting from the application of technology.	<p>Considered primarily from a manufacturing perspective where imitation should be discouraged through proper appropriation of value or presence of intellectual property (Jacobides et al. 2006).</p> <p>Service and other key activities of the focal firm are complementary of the main innovation. The existence of service is predicated on product or technological innovation where adoption is inevitable (Teece 1986). The assets and technologies are specialized and less likely to be duplicated by other actors (Teece 2006).</p>
Value co-creation	Practices of improving and developing the situation of an actor and service outcome as an objective through the application of technology.	<p>Need to define the key roles (including those of the beneficiaries) and describe the nature of value co-created by each actor role particularly in a B2B environment.</p> <p>The nature of value co-creation needs to be explained focusing on (1) mechanisms that facilitate integrations of three key actors in retail (i.e., retailer, supplier, and customer) (Lusch et al. 2007); (2) adapting key activities to different actors within different service business models (Bettencourt et al. 2014b); and (3) enhancing the transparency of resource integration activities in the service ecosystem (Lusch and Nambisan 2015).</p>

5.7 CONCLUSION

This chapter has drawn from the service innovation and marketing literature to provide a unifying framework that can facilitate the fundamental role of technology and its value creation potentials for innovating services. While the PFI is primarily developed from a manufacturing perspective, the frameworks in this chapter improve our understanding and contribute to the theoretical and practical knowledge gap for innovative service firms. Contrary to the frequent claims on benefiting from innovations, technologies do not hold the potential value that can be unlocked for the benefits of services and business models (Teece 2010; Zott et al. 2011). Instead, value creation of technologies is shaped through different forms of value and the integration of practices with multiple resources.

Considering the meta-theoretical perspective of PFI (Pisano and Teece 2007; Teece 2006), it allows revision and expansion to other theoretical conceptualizations. For instance, those used to conceptualize business models as an integrated system of interactions (Amit and Zott 2010, 2015). Or, those used to explain the changing patterns in delivering value in multiple forms (Lepak et al. 2007). Thus, a revised view of the PFI for innovative service firms, which considers the role of technology and its value drivers, fills the knowledge gap and supports its integration with the foundation of service-dominant logic. It also informs the business model literature, which is dominated by manufacturing perspectives (Teece 2010; Zott et al. 2011). It represents the interactions among the elements of a business model from the standpoint of service firms aiming to benefit from technology (i.e., in the form of technology value-creation) and innovate service (i.e., in the form of service innovation development).

CHAPTER 6 RESEARCH DESIGN AND METHODOLOGY

6.1 INTRODUCTION

“Understanding how research can advance scientific and practical knowledge is an ongoing challenge for scholars who work in professional departments ... a central mission of scholars in professional schools is to conduct research that both advances a scientific discipline and enlightens practice in a professional domain (Simon 1967).”

Underlying any form of research is a philosophy of science that informs us of the nature of the phenomenon examined (ontology) (Layder 1998); and methods for understanding it (epistemology) (Van de Ven 2007). However, we do not think much about the concepts and logic of understanding it so that we can get on with the craft of doing research instead of talking about it (Ritchie et al. 2013). Whether explicit or implicit, scholars rely on a philosophy of science to interpret the meanings, logical relations, and consequences of our observational and theoretical statements (Yin 2014).

This chapter describes the research methodology used in this study. The selection of the suitable methodology is based on the nature of research including the objectives and research questions, the philosophical assumptions, and the interpretive framework designed and developed for this research (King and Horrocks 2010; Yin 2014). The chapter offers a detailed and guided form of research for obtaining the advice and perspectives of key stakeholders (researchers, practitioners and managers) to understand a complex social problem. As a result, the research provides a visual process of the theory and presents an in-depth picture of the process and the cases using narratives, tables and

figures (Creswell 2013). Process studies are centrally concerned with how change unfolds in the entities or things being studied, through offering a sequential map of events (Van de Ven 2007). The model developed for understanding process theories, commonly known as a roadmap, highlights a stage-gate design with consecutive actions (Langley 1999). The roadmap is intended to achieve a specific goal and objective by exploring the sequence of different practices regarding the development of a product or service (Cooper and Kleinschmidt 1995; Pentland 1999). Through exploring the process, the research aims to examine the research questions primarily dealing with how things change and develop over time. By exploiting differences in the kinds of knowledge that scholars and other stakeholders can bring forth on a problem, research can produce knowledge that is more penetrating and insightful than when scholars or practitioners work on the problems alone (Yin 2014).

The methodology for this research project can be described as following an abductive philosophy. This was appropriate due to the lack of existing theory, and the emphasis on building theory before the development and as opposed to testing it. As a result of adopting a process theory approach, this research advances fundamental knowledge of a complex phenomenon by following the four steps of a research model proposed by the Andrew Van de Ven (2007) in his seminal work “Engaged Scholarship: A guide for organizational and social research” (see Figure 6.1). Later in this chapter, the four steps will be explained and linked to the purpose and perspectives of this research.

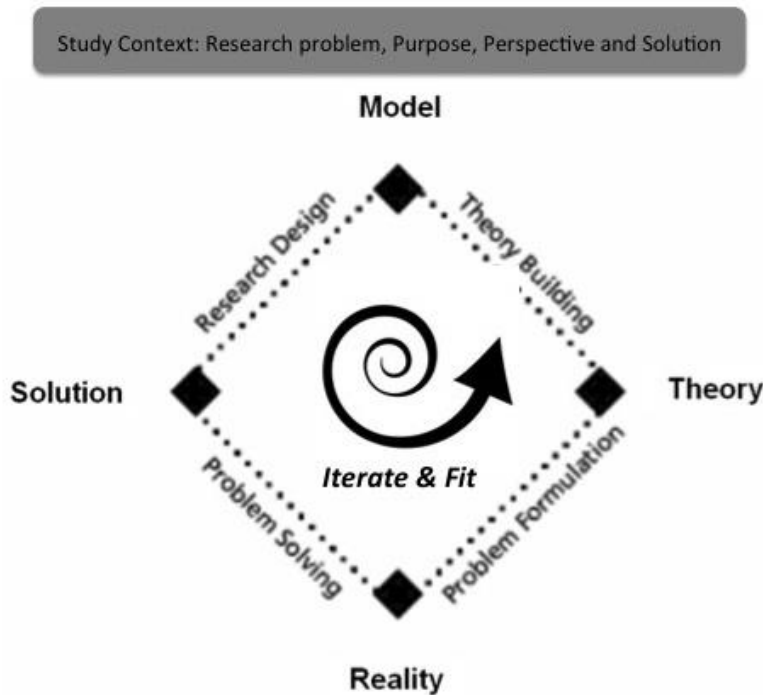


Figure 6-1 Process Theory Research Design (Van de Ven 2007)

The research is then followed by two phases of data collection, qualitative interviews with key informants and case study methodology. The research has adopted a qualitative research design seeking to address the need to strengthen theory building on the impacts of implementing technologies for innovating services. This also extends the limited empirical evidence on processes, which happen prior the final adoption or rejection of technology in service environments in general and the retail sector in particular. Next, an initial exploratory phase including nine main case studies in the UK retail sector was undertaken. This aided the researcher by providing direction to the study. In particular, the findings of phase one highlighted a need for in-depth case studies to understand the interconnections for the implementation process of technologies in practice.

The development of research design including the practical problem, the research philosophy, the interpretive research approach, and the connection among the research objectives and the research questions are illustrated in Figure 6.2.

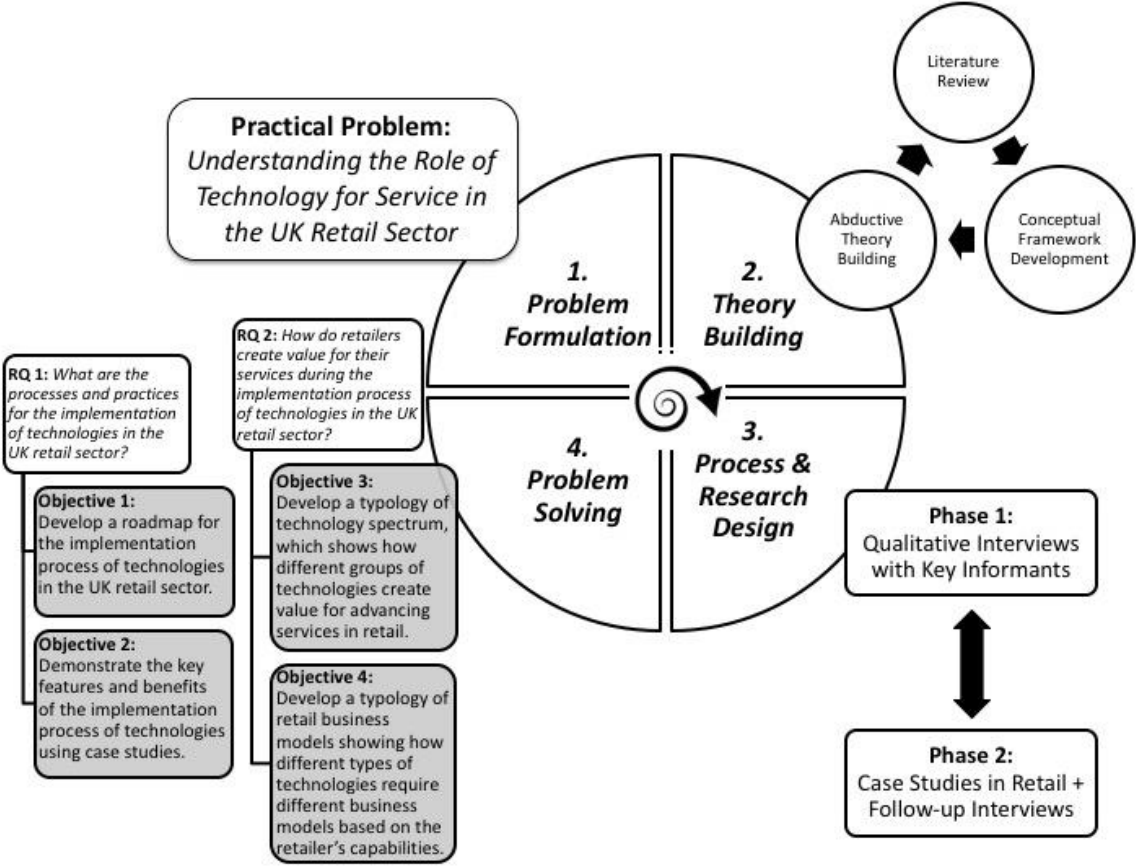


Figure 6-2 Author's Research Design

6.2 PROBLEM FORMULATION

Formulation and the design of the problem is often the most crucial task of process design. Understanding the problem, in reality, plays a crucial role in grounding the subject and helps to define the objectives and research questions accurately. It directly affects how theory building, process and research design, and problem-solving tasks are

performed (Van de Ven 2007). Yet, researchers often overlook or pay little attention to problem formulation (Creswell 2013). As soon as we consider the problem of the initial formulation of a research project we can understand the point the point about the lack of clearly segregated and grouped stages (Ritchie et al. 2013). However, when designing and formulating a research challenge, there may be no end-point to the formulation of the research problem (King and Horrocks 2010). Further, the research is always facing the challenge, as there is no reason to suppose that decisions about the central problems to be addressed can be unravelled from more data collection (Layder 1998). The process of problem formulation is supported by stating the four original steps of formulating and designing the problem introduced initially by Van de Ven (2007) (see Figure 6.3). The author follows these steps of formulating the research problem to explain the challenge in reality adequately.

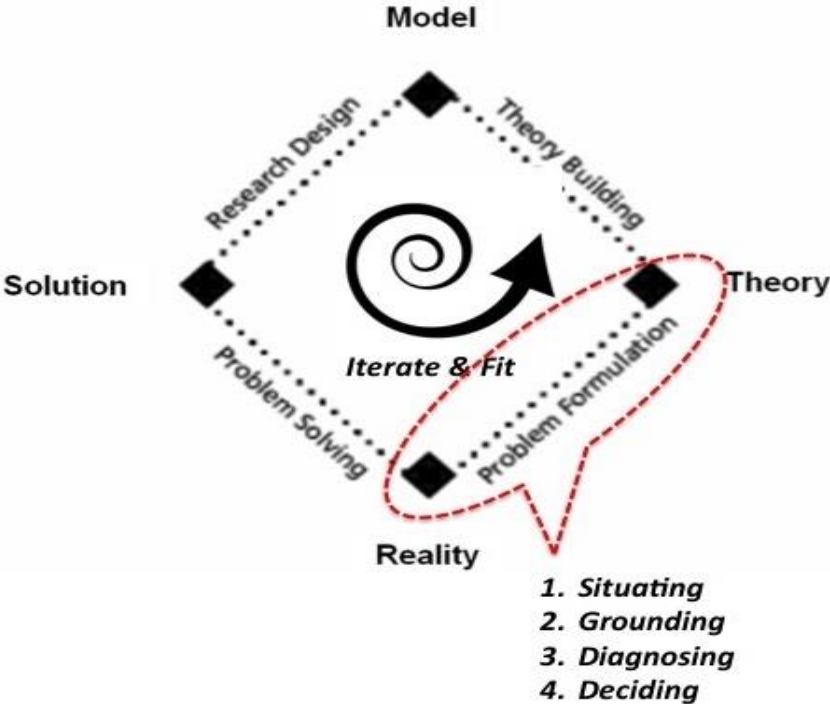


Figure 6-3 Four Steps of Problem Formulating (Van de Ven 2007)

6.2.1 RECOGNIZING AND SITUATING A PROBLEM

All problems motivating a study begin with a perception that something requires attention (Creswell 2013; Flick 2013). Problems are not given by nature, but by how and whom they are perceived. Some scholars may view a given problem in relatively narrow and precise point of view, which is experienced by a particular group of people or institutions at a particular point in time (Layder 1998; Van de Ven 2007). Others might view the same problem domain as being a general and unclear process diffused among many various actors over long periods of time. The diversity of perceptions among different actors highlights the wide range of interests and responsibilities for different members competing in the same context. In this sense, within the UK retail sectors, there are primarily three members involved known as, the retailer, the supplier and the customer. Suppliers, for example, tend to focus on the immediate and particular problems they are experiencing in running their business. Retailers are often concerned with more long turn plans while aiming for a more substantial population of customers. Customers, on the other hand, are looking for different forms of shopping, which are seen as a leisure activity rather than a chore.

In this regard, the starting point for formulating the problem in this research highlights the important role of technology for services. In the UK, advances in technology are leading to a proliferation of new service offerings while changing how multiple members in a service environment accommodate and interact with each other. In this sense, the retail industry has been a recognized context for practices of technologies within the service domain. Retailers are increasingly moving towards technologies aiming at improving efficiency and

productivity while cutting costs (Raconteur 2016). Incorporation of technologies enhances service levels, lowers labour operational costs, and has the potential to impact multiple dimensions of service (Wieland et al. 2017).

6.2.2 GROUNDING THE PROBLEM IN REALITY

Situating a problem and gathering information to ground it, in reality, are two overlapping stages of formulating a problem. The more a researcher can ground the problem in practice, the more they can appreciate different dimensions of the problems (Van de Ven 2007). Meanwhile, this creates the opportunity to provide a simple and clear understanding of a diverse range of audience (Creswell 2013). Chapter two of the thesis known as “Research Context” is a perfect example of the first two stages of formulating a problem. It highlights the latest challenges and trends within the UK retail sector. For particular social science studies including marketing and innovation, reviewing the literature to determine the scope, prevalence, and context of the problem is also needed (Bonoma 1985; Carson et al. 2001).

Daily examples of situating and grounding a problem are found in the introductory paragraphs of feature stories in many newspapers. For academic writing, usually, the first paragraph, which demonstrates the importance of the central study domain by using statistics and insights from the business press, is a perfect example of situating and grounding a problem in academic writing.

For this research, retailers are facing unprecedented levels of change. Competition and consumer expectations are rising (Ryding 2011), alongside this a fierce price war to increase market share are being driven by the discounters (Davis 2015; De Kerwenael et

al. 2006). This is forcing established retailers to re-evaluate their business activities to properly benefit from using the technology. Against this backdrop, technology companies large and small are offering retailers a staggering array of new technologies, from smart payment systems to in-store scanning systems for use by consumers via their smartphones (Raconteur 2017a).

6.2.3 DIAGNOSING AND ASCERTAINING THE PROBLEM

Diagnosing entails a disciplined application of models or theories to ascertain the specific nature of the problem in context (Van de Ven 2007). In this research, understanding the practices of implementing technologies for advancing and improving services shows the first steps of diagnosing to provide a disciplined structure for the implementation of technologies. In this sense, becoming familiar with a phenomenon existing in reality supplies multiple opportunities to diagnose expected and unexpected things (Creswell 2013; Seidman 2013). Expected things are predicted activities linked to the reality while unexpected things are those that do not conform to the model of reality. According to Van de Ven (2007), the unexpected activities show breakdowns that require new solutions or a different understanding of the problem domain to be uncovered.

This research presents a new approach towards understanding firms' management of new technologies, which highlights the importance of exploring the role of technology and how it delivers value. This emphasizes the expected results of the diagnosing step. As a result, the research extends and improves the understanding of the processes and practices of implementing technologies. These expected activities lead to the adoption or rejection of such technologies primarily in a retail context. The research further extends and improves

the understanding by providing a complete picture of the processes of implementation, which involves different members including the retailer and the technology supplier. Exploring different practices at the implementation process has led this research to uncover unexpected activities that conform to the model of reality regarding the importance of technologies for advancing services. This model is presented in the form of a typology as a conceptual set of unique types.

6.2.4 DECIDING WHAT ACTORS OR QUESTIONS TO PURSUE TO RESOLVE THE PROBLEM

This is the last stage of formulating a problem. The past three steps have uncovered the nature and domain of the problem, known as service domain and the retail sector. This step primarily shows what actors the research is focusing on. It also highlights the research questions, which were initially introduced in chapter one and continuously updated with regards to the objectives of this research. In practice, the solution to a problem-solving process is the application of a particular intervention that solves the problem identified (Denzin and Lincoln 1998). In research, however, the solution to a problem formulation process is often a research question that merits scientific investigation to better understand the problem and its resolution (Langley 1999).

The problem formulation activities of situating, grounding, and diagnosing provide numerous trials and opportunities to formulate, reframe, and modify the research questions. Refining the research question entails a clarification of the focus, level, and scope of the problem domain from the perspective of the research audience (Yin 2014). For this research, the primary users and beneficiaries are technology suppliers while the research ultimately provides implications for the retailers as well.

Furthermore, the focus of this research is on the implementation stage of the adoption process. It investigates the application of technologies and its impact on developing services involving technology suppliers. Finally, in contrast to the majority of existing research on firm's adoption of new technologies (Evanschitzky et al. 2015), this research advances our understanding of the value potentials of implementing the technologies as a success factor for improving and developing services (Storey et al. 2016; Zomerdijk and Voss 2011).

6.3 THEORY BUILDING AND PHILOSOPHICAL APPROACH

6.3.1 RESEARCH PHILOSOPHY

Theory building refers to creating, elaborating, and justifying a theory by abductive, deductive, or inductive approach (Van de Ven 2007). While theory construction entails logical deductive reasoning, theory justification requires inductive reasoning and argumentation (Flick 2013). In this scenario, the one stage before construction of the theory (deductive approach), which highlights the first step of the creation of theory is an abductive process (Dubois and Gadde 2002). Abduction entails creative insight that provides an innovative and possibly a revised perspective (Piekkari et al. 2010). An assumption developed through abductive inference represents a new plausible and revised alternative to an existing situation (Van de Ven 2007). Unlike the conventional thoughts on philosophical approaches for science studies, research often begins with an irregularity requiring abductive reasoning because the current explanation or theory may be too narrow or not broad enough to explain the anomaly (Dubois and Gibbert 2010; Shepherd and Sutcliffe 2011).

In studies relying on abduction, one significant difference as compared with both deductive and inductive studies is the role of the framework (Dubois and Gadde 2002). Here, the original framework is continuously modified and updated primarily as a result of theoretical insights gained during the process (Van Maanen et al. 2007). It also reflects the unexpected empirical findings and the need for further investigation of the relationships (Van de Ven 2007; Visconti 2010). This approach creates cross-fertilization where new combinations are developed through a mixture of established theoretical development and new concepts derived from the confrontation with reality (Dubois and Gadde 2002; Dubois and Gibbert 2010).

This research investigated the new concepts and derived relationships as a result of abductive theoretical development and through developing a typology of delivering value. The typology then extends the understanding of the interconnections by providing a set of unique cells (to use the typological term, *ideal types*). Meanwhile, the abductive perspective improves the current understanding of a given phenomenon through different types of conceptual or practical contributions including revising, delineating, summarizing, differentiating, integrating and identifying (MacInnis 2011). Since abduction may solve the problem or create an innovative insight, further development and justification of the theory can include deductive logic and then testing the hypotheses through inductive approaches (Dubois and Gadde 2002; Van Maanen et al. 2007).

In contrast with the conventional understandings, the abductive approach is to be seen as different from a mixture of deductive and inductive approaches (Piekkari et al. 2010). Particularly in management studies, an abductive approach captures the fruit of theoretical development, if the researcher's objective is to discover new things (Van de

Ven 2007; Van Maanen et al. 2007). Similarly, in this research, an essential purpose is to discover new variables and relationships rather than confirmation of the existing theory. While a basic understanding of the interconnections primarily emerges from the problem formulation stage, further development of the critical variables and various connections occur through the theory development stage. after the development of conceptual frameworks by using an abductive approach, the research then illustrates the interconnections among these variables and presents them in the form of a matrix of the technology spectrum. Through having followed up interviews and case study research, this matrix is further developed, which leads to the development of a typology of business model innovation in retail.

6.3.2 THEORY BUILDING

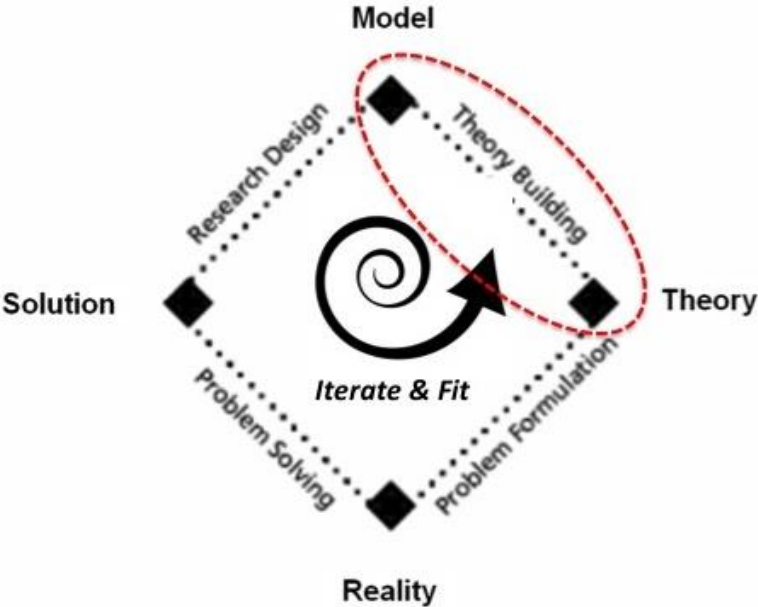


Figure 6-4 Theory Building from Practice (Van de Ven 2007)

Very often methods and textbooks on the mechanism of research begin with the assumption that the topic or problem that drives the research, and which it seeks to address, has been chosen in advance (Creswell 2013). This further jumps straight into the technicalities of a particular method of analysing the data in different forms. However, questions about the role and importance of the theory building in the formulation of research problems are usually ignored or even when considered as another technical phase of research (Layder 1998; Ritchie et al. 2013). In this manner theory building and theoretical issues are commonly proposed to solve tightly formulated hypotheses (or sets of assumptions) (Figure 6.4).

Layder (1998, p. 107) highlights that the combined effects of intuition and perception result in a general sensitivity or readiness to see concepts and thereby to identify or discover them in an innovative and revised matter. The concepts are not merely there in the literature waiting to be discovered, they are in a unique sense constructed by the researcher to spot them that induces their discovery through revising, delineating, summarizing, differentiating, integrating, and identifying (Johnston et al. 1999; Shepherd and Sutcliffe 2011). This is mainly because theorizing is not merely a logical process dependent on analytical skills (Van Maanen et al. 2007). Although there is a good deal in theorizing, which requires the application of formal powers of reasoning, the process also requires just as much intuitive, creative and imaginative skill (Bonoma 1985; Dubois and Gibbert 2010).

Theorizing involves the ability to zoom in and zoom out between the general (abstract) and the particular (concrete), and this requires creativity and innovative approaches (Calder and Tybout 2016; Layder 1998). In other words, to be able to combine theory

building with problem formulating, process design, and problem solving the handling of empirical and theoretical material in ways that are likely to produce novel forms of explanation is very much akin to the creative imagination (Eisenhardt 1989; Eisenhardt and Graebner 2007; Johnston et al. 1999). In this particular sense, being able to theorize in a way that is inclusive of the problem, in reality, has more in common with artistic or creative activity rather than strictly with a rational, logical and formal scientific approach (Van de Ven 2007).

Below the researcher explains how the theory building stage of the research, has resulted in the theoretical contributions of this research including, revision, integration, delineation and differentiation (MacInnis 2011). However, first, explaining the contributions of the theory building starts with a brief overview of the problem formulation stage and quick observation of the relevant literature.

Advances in technology are leading to a proliferation of new service offerings while changing how multiple members in a service environment accommodate and interact with each other. In this sense, the retail industry has been a recognized context for practices of technologies within the service domain. Retailers are increasingly moving towards technologies aiming at improving efficiency and productivity while cutting costs (Raconteur 2017a). Incorporation of technologies not only enhances service levels but also lowers labor operational costs (Wieland et al. 2017).

To date, research on innovation and service marketing literature has emphasized the significant impact of technologies on different service domains (Ostrom et al. 2015; Wieland et al. 2017); the degree of market readiness for new technologies (Parasuraman

2000); and the vital presence of technologies in service provision for economic exchange (Vargo and Lusch 2004a, 2016, 2017). Also, innovation and/or strategy research has highlighted the role of technological sophistication for successful service innovation (Snyder et al. 2016; Storey et al. 2016); how to capture value from it (Dotzel et al. 2013; Jacobides et al. 2006); and how to obtain economic returns from innovation in technology (Teece 2006, 2010a).

Despite these contributions, essential research gaps remain on 1) how the implementation of technologies can result in firm's value in multiple forms and 2) how the value creation potential of leveraging technologies can advance services; result in profiting from the core and supplementary resources, and lead to changes in firm's service practices. While the application of technologies for advancing services lays its background on different areas of the business literature, there is a gap within service management literature about a theoretical (and further developed empirical advances) perspective that strains the role of technology and its impact on value through integrating key areas from which, the service domain has been derived.

To better explain the innovative theory-building stage of this research, this research positions the contributions based on the categorization provided by MacInnis (2011) in the *Journal of Marketing*. Although the contributions of this research have been explained in chapter one and chapter four, here, for the purpose of the research methodology design, they are explained briefly as well. The contributions as a result of creating the theory and embracing an abductive approach are as follows.

First, the research offers a revised perspective for Teece's seminal work in 1986 and further developed in 2006 on how appropriability regimes profit from technological innovation and gain competitive advantage known as "Profiting from Innovation" (PFI).

Second, the research develops an integrative framework, which links two fundamental principles together to better explain the value potential of technology application. It integrates the revised-PFI framework with the theoretical foundations known as dominant service logic (S-D logic).

Third, the research delineates through providing a roadmap for the implementation of technologies in retail. The delineation enables the understanding of a roadmap or entity through explaining cause and effect relationships (MacInnis 2011; Van de Ven 2007).

Fourth, the research provides a typology of technologies for delivering value as a unique way of building theory. This research argues that a typology of technology spectrum within the service domain in general and the retail sector, in particular, is, in fact, a strong theory for three reasons. The typology offers a grand theoretical assertion as it shows how different technologies fit into different ideal types implicitly while explaining dependent variables.

Fifth, as a result of seeing different pieces, the research delineates through explaining different entities in detail. The typology of technology spectrum is further updated and presented in the form of a typology of retail business models. Therefore, within the theory building stage of the research design, the research will revise, integrate, differentiate and delineate.

6.4 RESEARCH DESIGN

Prior to undertaking the primary data collection, the researcher had to consider appropriate research philosophy, research approach, strategy, method of data collection as well as techniques and procedures of data collection and analysis (Figure 6.5).

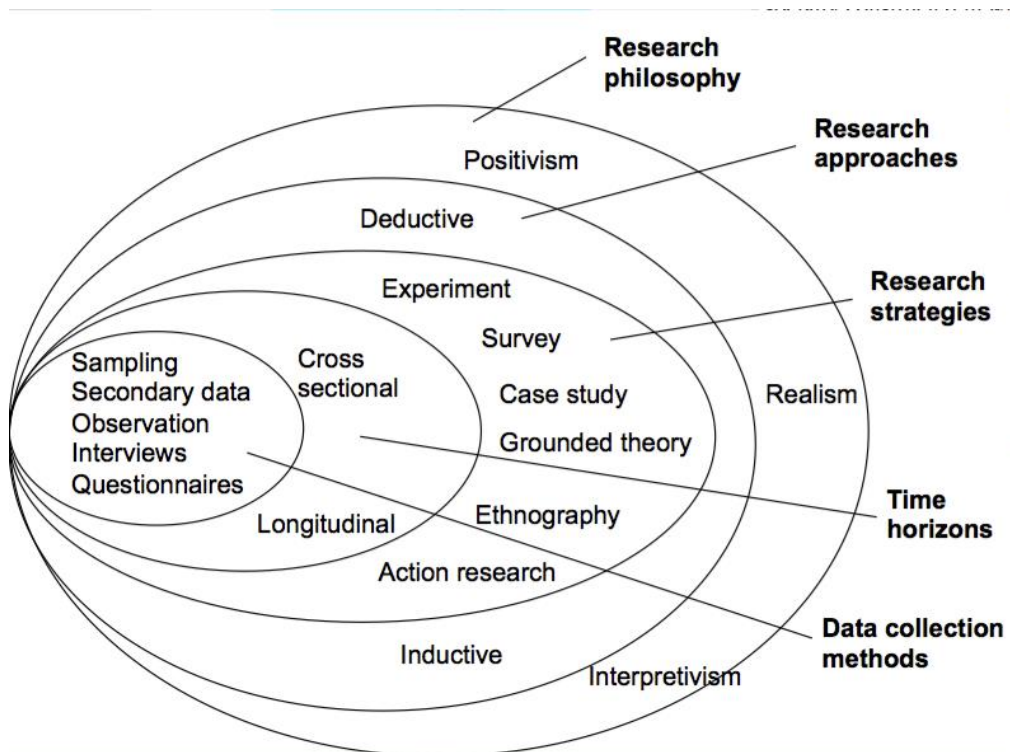


Figure 6-5 The Research Onion (Saunders et al. 2009, p. 138)

6.4.1 PROCESS THEORY

Process design provides general explanation and utilizes any method that can help make sense of change and development processes (Van de Ven 2007). It primarily highlights how things evolve and get shaped over time (Huber and Van de Ven 1990). Different approaches for research questions require different research models. Social science researchers tend to focus on two different types of starting points for research questions (Dubois and Gibbert 2010; Flick 2013; Pentland 1999): 1) What are the antecedents or

consequences of something? 2) How does something develop and change over time? While a variance model is appropriate for the first kind of question, a process model is needed to address the second type (Tsang 1999; Van de Ven 2007). Variance theories provide explanations for phenomena regarding relationships between dependent and independent variables or to justify hypotheses (Langley 1999). On the other hand, process theories provide explanations regarding the sequence of events leading to an outcome, which is commonly achieved by providing a roadmap (Folger and Turillo 1999) (see Figure 6.6). Here, the key objective is to understand the patterns of events and the way a particular outcome is achieved (Pentland 1999). For this research, a process theory design has been adopted where the primary objective is to provide a clear overview of the process of implementing technologies. In this stage, firms engage in assessment and business activities to evaluate the benefits and utilities of a technology. The final result of this stage would be to adopt or reject the technology considering the extent of value that it delivers in different forms.

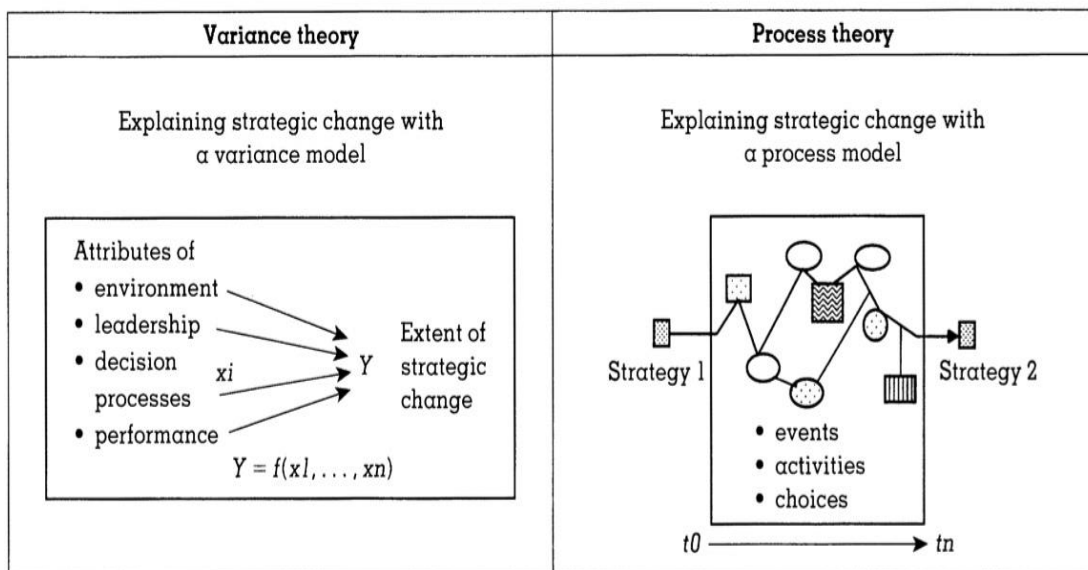


Figure 6-6 Two Approaches for Explaining Theory Development (Langley 1999)

6.4.2 DATA COLLECTION METHOD

The data collection for this research project involves two phases including semi structured qualitative interviews with key informants and case study research. A comprehensive qualitative research begins with assumptions and the use of theoretical frameworks that inform the study of research problems addressing the meaning individuals or groups ascribe to a social or human problem (Denzin and Lincoln 1998; Ritchie et al. 2013). To study this problem, qualitative researchers use an emerging approach to inquiry the collection of data in a natural setting (Yin 2014).

Stage one involves primary data collection including qualitative interviews with senior managers (known as key informants). Further, the interviews were complemented by examination of documentation and actual examples of technologies within the UK retail sector. The primary result of this stage is the process roadmap for the implementation of

technologies within the UK retail sector. The result of this stage also provides the basis for understanding the key features and benefits of the implementation process of technologies in the UK retail sector. This knowledge enables the researcher to achieve objectives one and two. Furthermore, the results of this stage supplemented with the review of the literature and the development of the conceptual frameworks have resulted in the creation of a three by three matrix. The matrix is then presented in form of a typology of technology spectrum in the UK retail sector. Finally, clear description of the outcome of phase one is presented in chapter 7.

The second phase includes the secondary data collection involving case study research and follow-up interviews with selected key informants. The data analysis for this stage was guided by the typology of technology spectrum, which includes value appropriation and value co-creation. The result of this stage has provided further updates to the classification of technologies (typology of technology spectrum). The updates highlight how different technologies in the UK retail sector fit into different cells and deliver value in different forms. Therefore, as a result of a typological case research, the research has provided nine short stories, each presented as a case study, for each cell within the typology. Each case study represents a cell from which the technology has been derived. Each case story highlights the key features and benefits of the implementation process considering its value premises. The research further argues why a typology is a reliable way of theory building for three reasons. The outcome of phase two of the data collection is presented in chapter 8.

6.4.3 PRIMARY DATA COLLECTION

Understanding a problem by real-life data shows an exploratory study in nature through creating a perspective of what is known and what is happening in a particular context (Carson et al. 2001; Creswell 2013). A variety of methods are useful for undertaking this exploration. These methods include information-gathering activities drawing on personal experiences, direct or indirect conversations with experts and individuals who usually experience the problem through interviews, or in group meetings, as well as direct observations of the situation in a particular context (King and Horrocks 2010; Seidman 2013). Reviewing the literature to determine the scope, prevalence, and context of the problem is also needed (Eisenhardt 1989; Langley 1999; Piekkari et al. 2010).

The primary objective of these activities is to become familiar with the problem while simultaneously developing the theoretical perspective of the research (Flick 2013). Meanwhile, answering the fundamental questions of who, what, where, when, why, improves the generalization of the process design (Creswell 2013). This step requires both particular and general answers to these questions. Particular answers provide a detailed description of the problem based on first-hand observation and involvement in the desired context (Denzin and Lincoln 1998). On the other hand, general answers show that the particular case is not unique; instead, it is an instance of a much more significant or pervasive problem (Van de Ven and Polley 1992).

The interviews were mostly unstructured but covered the story of the implementation process and the motivations behind it. They also included actions taken related to the implementation, the relationship between the technology suppliers and their clients

(primarily retailers), and the impact on the community. The interviewees were allowed free reign to express their views and raise new issues to improve the depth of the information (Jaakkola and Alexander 2014). Further, the interviews were complemented by the examination of documents and actual examples of technologies within the UK retail sector. The use of essential informants is considered appropriate where the content of the research is an integrative examination and in-depth information cannot be obtained from a quantitative analysis (Halinen and Törnroos 2005; MacInnis 2011). Key informants describe their patterns of interactions and execution (Seidler 1974); while providing observed empirical experience as a result of advancing services through the use of technologies. Their practical knowledge can offer insight into the inner interactions of the phenomena (Kumar et al. 1993). The key informants, whom are identified as KI1, KI2, etc., were retail executives and retail marketing directors, particularly those involved in providing technological solutions to the retailers. A summary of the key informants and a summary of the companies are provided in the Appendices.

The researcher contacted marketing and sales directors working in the UK retail sector, alongside those who were known to the researchers (after initially approaching 35 managers) with a particular experience in technology supplying firms. Informants were selected based on their involvement in the processes of persuasion, decision and implementation before final adoption or rejection of new technologies. Finally, the interviews were conducted face to face, via Skype, or through phone calls, depending on participants' preference. A total of 25 interviews were conducted, each lasting between sixty to ninety minutes. The number of interviews for each case was driven by the complexity and importance of the case (Creswell 2013).

Yin (2014) states that a minimum of 5 cases are satisfactory to improve reliability and offer theoretical insight into the phenomena. Furthermore, Creswell (2013) highlights that a minimum of 3-5 interviews for storytelling is reliable to contribute to the theoretical and practical knowledge of case study research. Key informants were selected based on (1) the degree of knowledge and input they had with regards to either (or both) of the activities on the appropriation and creation axes; and (2) their specialized knowledge about key features and patterns of the chosen technologies. Retail technology executives in every case, and in some cases, multiple members of a technology supplier were interviewed. A research protocol was designed, including the key research questions, research objectives, the interview questions and further probing questions as required. Driven by the research objectives, the interview questions can be found in the Appendices. The protocol focused in two key areas. Firstly, describing and understanding the activities, processes and practices prior the adoption or rejection of new technology. Secondly, understanding about how the technologies can advance services and deliver value to the firm in forms of appropriation and co-creation.

In order to clarify the procedure for the development of the research questions, the preparation process offered by Mason (2002, p. 72) has been adopted (see Figure 6.7). This process was to ensure that the interview research questions align with the research objectives and the research questions. As shown in Figure 6.7, the process follows seven key steps. The procedure of adopting the steps as well as the interview questions is included in the Appendices.

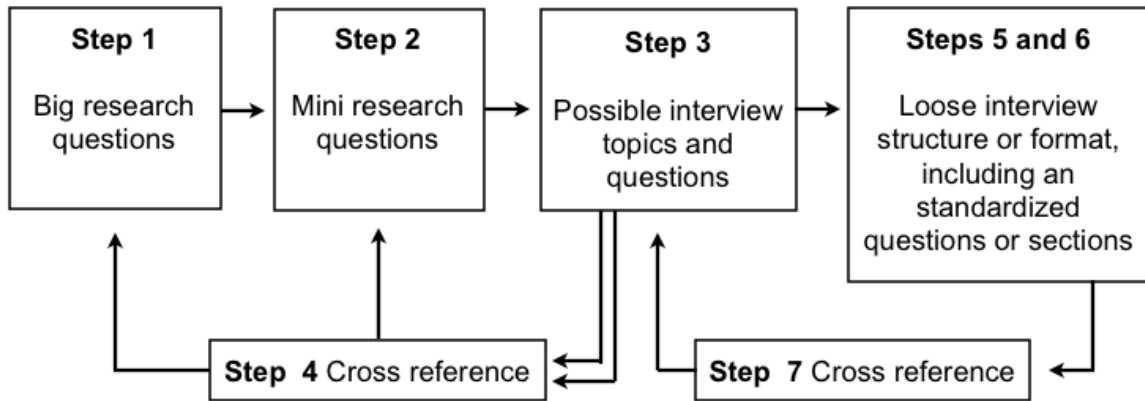


Figure 6-7 Overview of the Planning and Preparation Procedure for Qualitative Interviews (Mason 2002, p. 72)

The data was analysed using open and axial coding (Strauss and Corbin 1998). First, during the open coding, the researcher grouped similar respondent statements. This process was used as an outset to generate categories and key themes. Second, during the axial coding, the author searched for logical links between specific respondent statements and the detailed premises of technology value-creation, service innovation development, retail business model, and retail strategy. The key purpose of the axial coding was to systematically develop and link categories with subcategories. Coding interviews result in a more structured and simplified analysis and provide theoretical and contextual depth (Eisenhardt 1989).

In order to better explain the coding steps, Table 0-3 in the Appendices provides an example of the interview coding process using two levels of coding. During the open coding stage (level 1), responses were shortened and clarified into simple forms. Some of these include practices of the implementation process, importance of market research, discussing the use of technologies in different channels, understanding business model innovation for the retailer, and discussing different dimensions of service innovation in retail. During the axial coding stage (level 2), key terms were defined to classify the

responses into subdivisions. While different groups could result in the same term, some of the subcategories include patterns of implementation process, importance of implementation process, retailer-supplier relationship, attitude towards technology, retail practice, retail strategy, and service innovation development.

Where interview respondents identified particular technologies, and the researchers considered it pertinent, these were further examined through store visits where customer interactions with the technologies were observed to understand how they improved efficiency and effectiveness (e.g., Tesco undertook a pilot process to assess an innovative high-speed checkout system in its Lincoln Extra store from May 2014). Responses were further contextualized with recent supplementary industry and consultancy-based literature on service innovation, retailing literature, service marketing, and how to deliver value by using technologies in multiple contexts.

The data collection process revealed some practices specific to the implementation of technologies for advancing services. The implementation practices of using technologies for advancing services were analysed focusing on different aspects of the implementation process of technologies. Support for the problem formulation, theory building stage, and patterns underlining the theoretical literature, as well as differences, were identified (Hillebrand et al. 2001a). Comparing the outcomes to the relevant literature confirms, extends, and refines theory while building strong internal validity (Eisenhardt 1989). In the final stage, the results and outcomes were shared and discussed with the key informants to ensure that the categorization correctly presented their arguments about implementation practices.

6.4.4 SECONDARY DATA COLLECTION

Providing direct evidence in here resolves the testability problem for the further development of theory (Eisenhardt 1989). The use of case studies was consistent with the aims of the project to study a phenomenon that is dynamic and process in nature, and in which the unfolding events play an important role in building explanations (Pettigrew 1992). This approach first enabled the researcher to better describe and understand both the processes and the influences involved (Yin 2014). Second, it allows investigation of how services unfold by using technologies in a real-world environment in which decisions take place. Third, it is well suited to study the overall picture of the research object and describes the context of the theoretical phenomenon under study (Dyer and Wilkins 1991). Fourth, the case study method is an appropriate strategy for enriching or extending theory (Yin 2014); while typology research can enforce the theory building since typologies are well-developed types of theory (Filley and Aldag 1978).

For the purpose of the research, the selection process of technological case studies is as follows. First, we searched for articles published in leading academic and practitioner-oriented journals in the fields of marketing, innovation and business management during the period of January 1960 to December 2016. The researcher focused on the articles that contain the terms technology, service, and retail in keywords, abstract and/or title.

Second, a number of complementary resources consistent with those in previous literature reviews (Collier and Sherrell 2010; Grewal et al. 2011; Gustafsson et al. 2015; Johne and Storey 1998; Ostrom et al. 2010, 2015; Patrício et al. 2011; Sethuraman and Parasuraman 2005; Snyder et al. 2016; Storey et al. 2016; Westjohn et al. 2009; Witell et

al. 2016) were used to create a comprehensive list of relevant technologies as inputs affecting services.

Third, database searches were conducted in EBSCO, JSTOR, ScienceDirect, WileyOnlineLibrary, Sage, EmeraldInsight, TandFOne, Web of Science, Passport Euromonitor International, and Mintel using keywords as service, technology, and retail.

Fourth, a manual search of the following marketing, innovation, and management journals according to the latest version of ABS ranking (Association of Business Schools 2015) was conducted: *Journal of Consumer Psychology, Journal of Consumer Research, Journal of Marketing, Journal of Marketing Research, Marketing Science, International Journal of Research In Marketing, Journal of Retailing, Journal of The Academy of Marketing Science, European Journal of Marketing, Marketing Theory, Industrial Marketing Management, Journal of Business Research, Journal of Product Innovation Management, Research Policy, R&D Management, Technological Forecasting and Social Change, Technovation, Journal of Service Research, Harvard Business Review, MIS Quarterly, California Management Review, MIT Sloan Management Review, Strategic Management Journal, and Long Range Planning.*

Fifth, as the final input, during the process of interviews, key informants were asked to contribute to the list of technologies. Therefore, the overall of 28 technology cases were determined as presented in nine categories within the typology. These technologies and their classification in form of a typology are explained in chapter 8 in detail.

Since the abductive integration of revised-PFI and S-D logic is at the early stages of the research, building theory from case study research and typological development provides

freshness to a new topic and new research areas (Doty and Glick 1994; Dyer and Wilkins 1991; Yin 2014). Overall, a strong theory has a good, although not necessarily perfect, fit with the cases (Eisenhardt 1989). In an attempt to better explain the logic and the use of case studies, below the researcher augments the theoretical contribution by delineating the roadmap for building theories originally introduced by Eisenhardt (1989).

- 1) Getting started: while there is extensive research on the use of technologies within service domain, the question remains as: how do companies implement and apply new technologies for their services? Moreover, how do these practices of technology application deliver value?
- 2) Selecting cases: a range of technologies in the UK retail sector was chosen to reduce unrelated variation while underlining the domain of the conceptual theory (Dyer and Wilkins 1991). The selection of the relevant cases improves the validity of the research while contributing to theoretical and practical knowledge gap (Beverland and Lindgreen 2010).
- 3) Crafting instruments and protocols: a mix of abductive theory building, development of a typology using case studies, and qualitative data collection to strengthen the outcome of the research was adopted. The triangulation made possible by multiples methods provides stronger substantiation of constructs and ideas (Eisenhardt 1989).
- 4) Entering the field: to augment the integrated framework and provide a clear understanding of the process design, halfway through the process of building theory, the research started the qualitative interviews with key informants and the

case study approach (Kumar et al. 1993). This process allows the unique patterns for each technology to emerge and give the researcher a rich understanding, which happens from the cross-case comparison (Yin 2014). It also improves the validity and reliability of the cases (Eisenhardt and Graebner 2007).

5) Analysing within-case data: key informants were asked to choose the relevant technologies linked to the constructs and ideal types introduced. Once a group of technologies were selected for each ideal type, the research provided detailed description and definition for each ideal type linked with the particular group of cases. These write-ups and definition are central to the generation of insight for building theory using case studies (Bacharach 1989). This process allows the unique patterns for each technology to emerge and give researcher a rich understanding (Yin 2014). The process enables the familiarity with data and preliminary theory generation (Eisenhardt 1989).

6) Shaping hypotheses: the research builds a typology on how different technologies create value to advance services in the UK retail sector. This augmented the theory building by using multiple sources of evidence (including qualitative interviews with technologies suppliers and retail managers) in an attempt to establish typology validity and reliability (Mills and Margulies 1980). Careful construction of the typology provides the sharply defined cells, which are necessary for a strong theory (Doty and Glick 1994). At this point, the allocation of case studies is useful for understanding why or why not new relationships exist and while establishing validity (Dyer and Wilkins 1991).

- 7) Gathering literature: careful consideration of key areas within service domain forced the author into a more divergent and out-of-the-box thinking. The result provided deeper insight into both the theory building and the relevant literature (Eisenhardt 1989). The literature and PFI framework fail to consider service as the core product with technologies being complementary alongside other complex entry assets. While some service firms (i.e., retailers) have introduced their core technology development programs and received protection for them. This conflict resulted to a new perspective of PFI where technologies play a complementary role for service innovation and exchanging service levels.
- 8) Reaching closure: Having nine cells for the typology made it convincing to cope with the complexity of building theory and offering validity (Doty and Glick 1994). As a result of qualitative interviews, case study analysis, and abductive theory building, the theoretical saturation – the point that incremental learning is insignificant (Glaser and Strauss 1967) – was reached. Therefore, the final product of building a theory, which was 1) the conceptual frameworks on how the implementation of technologies create value and releasing the value creation potentials of technologies; 2) the implementation process of technologies and the result of understanding different stages; 3) a typology of technology spectrum to justify and support the value premises for different technologies; and 4) a typology of retail business models as a way of delivering value and building theory, was achieved.

6.5 PROBLEM SOLVING

6.5.1 CASE SELECTION AND PROCESS

Given the aim of exploring and understanding the impacts of implementing technologies for advancing services, a case study exploratory approach for the analysis was adopted. The research uses multiple case studies, as it provides detailed and longitudinal data over a period while studying complex phenomena embedded in their context (Creswell 2013; Eisenhardt 1989). The phenomena can include different steps, through which technologies are evaluated and incorporated with their value drivers. This approach is exclusively appropriate for addressing how the integration of different activities result in different application types (Eisenhardt and Graebner 2007; Fiss 2011). Finally, cross case comparison delivers additional validation to the study of phenomena within this context (Eisenhardt and Graebner 2007).

To facilitate the theoretical generalization of the typology the researcher uses a diverse and extreme range of samples from very high to shallow performing cases to better observe internal and conflicting patterns (Eisenhardt and Graebner 2007; Hillebrand et al. 2001a). Therefore, a variety of case studies were observed, where: i) some cases are widely recognized and adopted within the service sector (e.g. self-service checkout machines or loyalty cards), ii) some have passed the implementation process and are at the early steps of the adoption (e.g. beacon technology and scan as you shop), and iii) some are being implemented considering the return on investment and operational aspects (e.g. high-tech checkout and smart ordering magnet). The result of this approach

can frequently surprise reviewers as the empirical evidence is continually supporting the theoretical outcome (Creswell 2013; Siggelkow 2007).

6.5.2 TYPOLOGICAL CASE STUDY

As stated before, the research provides a typology of delivering value as a distinctive way of building theory. This primarily shows the final result of the data collection, which is presented in chapters 8 and 9. As such, the third and the fourth objectives of the research were achieved. Therefore, first, a typology of technology spectrum and second, a typology of retail business models in the UK retail sector were developed. Here the research uses the concept of typology and the case study approach. A typology refers to a conceptual set of unique types, which show organized connections (Hambrick 1983). It categorizes multiple modes as theoretical constructs, each of which illustrates a combination of activities that result in different outcomes (Mills and Margulies 1980).

While typological theories using case studies are exclusive and entirely different from simple classification systems, they meet at least three crucial requirements of being a theory. Unlike the contrary understandings as typologies are not theories, a typology of benefiting from technology within service domain is, in fact, a strong theory for three reasons. To consider typologies as theories, one has to understand that typologies meet the primary criteria of theories. Theory building researchers seem to agree that there are at least three requirements for theories, which a well-developed typology meets all of them: (i) constructs or premises must be created (ii) connections among these constructs must be clearly illustrated (iii) the relationships must be capable of being tested by further

empirical investigation or observation (Bacharach 1989; Doty and Glick 1994; Whetten 1989).

In a typological case research, a categorization for multiple sets of activities is created, while different case studies are allocated as examples for each combination of activities (Doty and Glick 1994). Since typological case research is based on unique types of organizations, it allows the researcher to identify structural sets - however not existing yet - that can improve organizational effectiveness (Fiss 2011). As a result, if these structural sets are well presented and explained, they will enable researchers to define new constructs (ideal types) and set of rules (dependent variables) for the current outcomes of service organizations (Mills and Margulies 1980). The key discussions in this research are developed by positioning the typology of value creation potentials of technologies based on the categorization provided by Doty and Glick (1994) and further supported by Snow and Ketchen (2014).

The ideal types and building blocks are key elements in theory building and providing practical and theoretical contributions. Doty and Glick (1994) define ideal types as compound constructs, which are the result of configurations between multi-dimensional building blocks. In this research, the allocation of the technologies and the implicit predictions of service innovations and business model changes, which accompany each ideal type, are deductible and subject to disconfirmation. Further, the fact that different technologies may not be inclusive of particular types and can be allocated to different ideal types as a result of testing highlights the “falsifiability” criteria for reflecting typologies as theories (Bacharach 1989; Doty and Glick 1994). This typology is a complex theory that is subject to empirical testing (Fiss 2011).

Meanwhile, the typology in this research provides a grand theoretical assertion (Doty and Glick 1994) as it implies how different technologies with regards to service innovation, fit into different cells implicitly. This typology is a complex theory that is subject to empirical testing (Fiss 2011). While we argue how different types result in different service innovation and business model change, we do not explicitly state why the set of different types should predict such a change across different firms. What we imply here as a theoretical assertion regarding the fit of technologies into different cells, makes the allocation of them inclusive as they could fit into multiple cells at the same time. In fact, because of this unique and classic feature of our typology, it meets the criteria of building a theory (Snow and Ketchen 2014).

Meanwhile, it's worth mentioning that our typology – the same as well-developed typologies, which offer a theoretical debate – is not a grand theory about different types of value, but rather about designing the subsets and variables of value creation potentials for technologies within each value premise. Neither the grand theory explicates strategies for value appropriation nor value co-creation, rather describes the importance of each unified component within these value premises as a consequence of appropriation or co-creation. Therefore, the typology in this research offers a conceptual contribution as it relates by differentiating and seeing different pieces and dimensions (MacInnis 2011).

To explore the key implications of the typology considering the integrated framework, the research drew on the preceding analyses, supplemented with insights gained from the case study research and follow-up interviews. To complete building theory from the development of the typology, first, a unique definition for each ideal type is provided. Every ideal type represents a distinctive business model for a retailer. Second, each retail

business model is described in detail to provide a clear understanding about how retailer's activities and resources are used.

6.6 ETHICAL CONSIDERATION

Ethical issues in a research highlight the moral perceptions of informed consent procedures; deception or covert activities; and confidentiality towards participants, sponsors, and colleagues (Creswell 2013). The design stage of a research project may create ethical problems as a result of having different levels of data collection (King and Horrocks 2010). It is the researcher's responsibility to provide confidentiality for the participants through protecting the anonymity of the informants (Flick 2013). To gain support from participants, a qualitative researcher conveys to participants that they are participating in a study, explains the purpose of the study, and does not engage in deception about the nature of the study (Denzin and Lincoln 1998; Yin 2014). The researcher should clarify the purpose statement, research questions, and key objectives to establish trust and credibility (Seidman 2013). The researcher should also protect the participant's privacy and reserve confidentiality during the data collection process including interviews, reporting, and analysis (Ritchie et al. 2013). An in-depth explanation of the ethical process including the principles and different stages can be found in the Appendices.

6.7 CONCLUSION

This chapter discusses the research methodology and design of this study. The lack of literature on the relationship between technology and its value drivers for innovative

firms meant a more exploratory methodology was justified (Dotzel et al. 2013; Ostrom et al. 2015). Also, the complexity of potential variables and the relationships between them justified a method that could capture such scope and difficulty while explaining different outcomes (Doty and Glick 1994).

Within the service management literature, as the focus moves away from serving customers to serving complex value networks, there remains a theoretical and practical knowledge gap in service research that explores the impact of technology on service innovation and the interconnection with its value drivers. Further, the field of new service development (NSD) and service innovation, particularly in a service context, is a growing innovation discipline. Despite the growth of conceptual and empirical articles about the concept of service, several authors have criticized the lack of attention paid to service innovation. Compared to product innovation there is a lack of consistency across service innovation findings (Biemans et al. 2016; Witell et al. 2015).

As far as methodological issues are concerned, after almost three decades of research in NSD, it is imperative to move toward more rigorous research methodologies, which would allow the investigation of complex relationships among variables (Gustafsson et al. 2015; Papastathopoulou and Hultink 2012). So far, NSD has been mainly examined through cross-sectional data (Ostrom et al. 2010, 2015). However, relying only on such data decreases the researchers' ability to investigate causal relationships (Creswell 2013). Therefore, longitudinal studies of service research, which capture the temporal and multidimensional aspects of service innovation alongside its interaction with technology, should also be designed to test causality (Papastathopoulou and Hultink 2012).

CHAPTER 7 FINDINGS: INTERVIEWS WITH THE KEY INFORMANTS FROM TECHNOLOGY SUPPLIERS IN THE UK RETAIL SECTOR

7.1 DEVELOPMENT OF A MODEL OF THE TECHNOLOGY IMPLEMENTATION PROCESS

A fundamental phenomenon of this research, considering its objectives, is to develop a multi-level and continuous route for the implementation process of technologies. Moreover, the specific goal, developing a managerial process model and assessing its usability in real-life business, requires a further case study approach. This is significant when the objective is to study the development of networks of activities and stages in order. Taking into account the resources of the project, the qualitative interviews and case study approach allowed more in-depth data collection results. This intensity is especially crucial in addressing the unfolding of the process of network construction (Pentland 1999).

The last two decades have witnessed a proliferation of research highlighting the importance of adopting technologies for service innovation activities (Venkatesh et al. 2007, 2012). The diffusion and adoption research has yielded many competing models, each with different sets of determinants. The dynamics of adoption have been explored considering the consumer perception during the use of technology (Evanschitzky et al. 2015); the negative and positive effects of post-adoption usage (Obal 2017); and with regards to the innovation factors affecting products and processes at the firm level (Damanpour and Gopalakrishnan 2001). Different issues have also emerged as: how firms

adopt and use new technologies, the anatomy of the adoption process, why firms fail in the adoption process, and what separates success from failure.

Despite research on different areas, new technologies failure rates remain high and, in many cases, the same reasons for failure are repeated. This highlights the fact that many service firms (i.e., retailers as in the context of this research) have time-consuming adoption process and have been slow to benefit from different technologies (Venkatesh et al. 2017). One reason why firms have been slow to respond to the technological changes in the market is concerned with the way findings are presented. Reasons for failure and success of adoption research finding with regards to the acceptance of a new entrant have been reported on a variable by variable basis. However, the managerial perspective requires for a visual and step by step model comprising critical resources of the firm (Venkatesh et al. 2007). More critical is that the findings have not been interpreted as meaningful and tangible guides to action. For instance, despite the diverse range of technologies introduced in the retail sector, retailers are still known as late adopters (Raconteur 2017a). Besides the retailer's attitude, technology suppliers are offering retailers a diverse range of technologies, which is a finding of interest from an academic standpoint. However, what steps should the retailer or the upstream technology supplier consider for becoming more responsive to the technological changes in the market and with regards to continuous adoption intentions?

What is missing is the presentation of the research outcomes into a managerial guide. The most commonly proposed managerial guide is the process model (Langley 1999; Partanen and Möller 2012). This represents a stepwise roadmap that highlights the sequence of practices performed by different members (i.e., referring to chapter 4, actors). The

process model created in this research is designed to move the technology from the awareness stage through to a successful launch (see Figure 7.1). Furthermore, a comprehensive model can specify requirements of different actors in different stages as well. In doing so, first, an ideal model that highlights the practices benefiting from technology (i.e., the implementation process model of technology) must be sufficiently specific and detailed to act as a roadmap and guide to managers and practitioners, yet not so complicated to discourage them from using it. Second, it must be strongly business model oriented, building on firm's objectives for value creation and different forms of capabilities as core or complementary. A constant concern may also be the development of a model that is adjustable in delivering service innovation advantage, one that benefits the actors involved in the process as well (see Figure 5.2 in chapter 5 for the actor-to-actor network during the implementation process of technology in retail). So, the model must be multidisciplinary to foster collaboration among key actors (i.e., the retailer and the technology supplier, see Figure 7.1).

The implementation process of technologies for service firms in general and retailers, in particular, will always have a high risk. This is due to the fact despite the low rate of adoption in the retail sector (Inman and Nikolova 2017), retailers rarely benefit from the intellectual property of the technology. Further, because of the increasing rate of incremental change, technologies have a short life cycle to result in competitive advantage. This emphasizes the crucial role of a multidimensional and effective implementation process. Although, much can be learned about effective adoption process from a review of the experience in the past adoption curves in other firms, little, if any, can be observed about the practices before the adoption. This gap particularly calls for a

rich understanding of the implementation process with regards to diffusion of technology. As such, many of the insights from the review of the experience in other firms have been incorporated into the implementation process model of technology presented in the chapter (see Figure 7.1). No technology will necessarily follow the process model thoroughly. Certainly, unforeseen events and exceptional circumstances will lead to additional steps; deletion of certain steps or activities; and focusing longer on a particular step. The main advantage of the technology implementation model in this research is to contribute to the theoretical and practical knowledge gap by providing a normative guide to managers. This will ensure that many of the crucial steps in the process are not overlooked or overemphasized.

This chapter presents the key findings from the first stage of the data collection process. The results show the processual nature of the activities involved in the process of the implementation of technologies. In doing so, as explained in chapter 6, the primary research method involved in-depth qualitative interviews with the key informants. This data was supplemented with real-time participatory observation, which is argued to be especially suitable for examining the development of complex processes. As a result, the chapter presents a process model for the implementation of technologies (see Figure 7.1). This model comprises of nine unique stages. While some firms implement shorter stages within this model, the fundamental activities presented within each stage remain the same.

Each stage of the implementation process model includes critical activities that cannot be overlooked. Within every stage, the researcher tried to provide direct quotes from different key informants. This further highlights the quality and reliability of the

implementation process model. Initially, as the primary outcome of the qualitative interviews supported by the iterative abductive theory development (Dubois and Gadde 2002), the process model for the implementation of technologies was established. Finally, to ensure the reliability of the model, the established process model was reviewed and commented upon by the key informants.

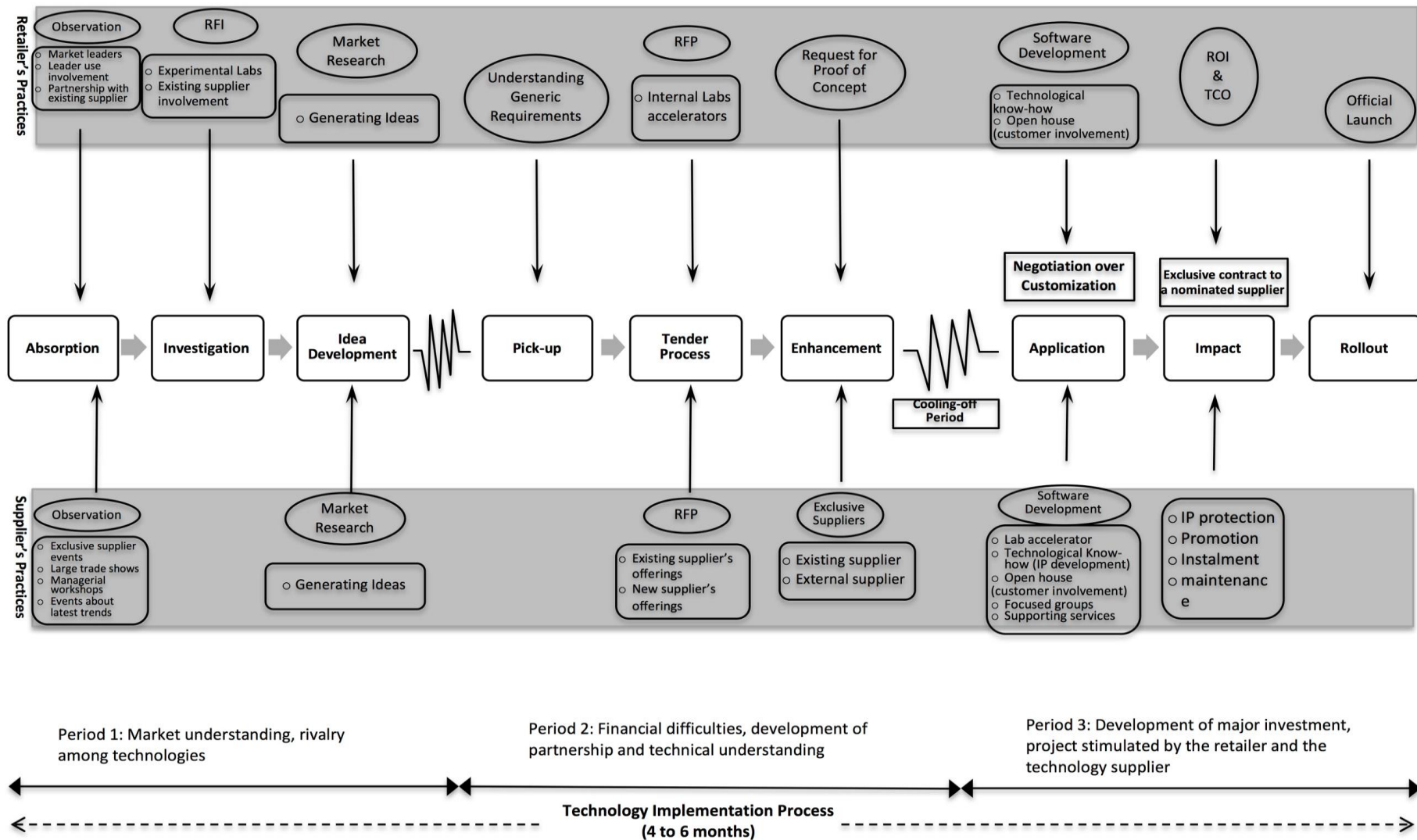


Figure 7-1 The implementation Process of technologies in the UK retail sector

7.2 STAGE 1: ABSORPTION

The first stage of the implementation process highlights the importance of absorption. Absorption primarily refers to scanning the current market to provide a clear understanding of the latest trends and updates, primarily involving customer experience. In this stage, the firm tries to improve the awareness of an emerging technology. The initial knowledge may happen through different communication channels. While other individuals may gain awareness and knowledge about technology through behaviour and experience that they initiate. As the key informant 4 noted:

"... One day the store manager went shopping for his launch. He used technology for his checkout process, and liked it... the next day he set up a meeting suggesting that we should consider that technology, it is very engaging ..."

The absorption stage always highlights the internal connections among different departments. Key informant 5 said:

"... There's always an internal process before developing improving services where retailers look at a new or update of existing technology. This internal evaluation process involves partners who could contribute to the development process including existing suppliers and customers ..."

In this phase, the aim is to provide a basic understanding of the main characteristics of the technology and its specific environment. The primary output of this phase is the expression of interest from a senior manager to investigate further and collect relevant information. The focus is on the final outcome of customers' needs, desires or problems

that the retailer hopes to address through innovating its service. This is the starting point for the analysis of the consumer preferences, consumption activities, and the customers' needs to employ technology. At this point, the retailer is considering different aspects of its service simultaneously to capture a better fit between the technology and their existing service. Understanding customers' activities and capabilities are essential to the innovation in service, as it influences the design of the offering and the value activities. Depending on the type of activity, the motivation can be the retailer or the supplier initiatives. The absorption stage happens typically through six different routes (see Figure 7.2).

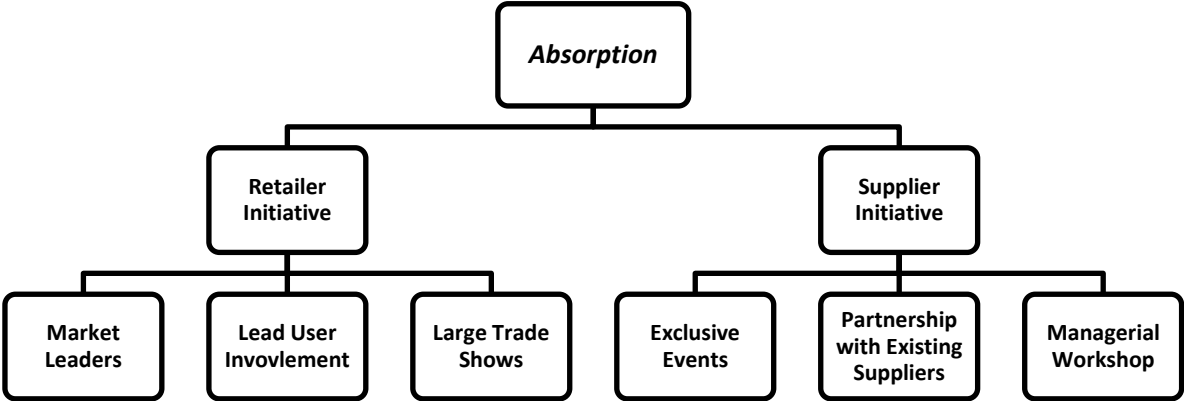


Figure 7-2 Absorption stage of the technology implementation process

- 1) Market leaders: limited resources and capabilities for a firm can lead to a decline of adopting new technologies. While most retailers consider themselves as fast followers, in reality, the majority are laggards. Where a retailer decides to adopt technology for advancing services frequently, it is only at the point that its primary

competitor has already applied the technology. Despite the retailer's interest on innovating its services, they remain as late adopters when it comes to service innovation through the application of technology.

- 2) Lead user involvement: it refers to a specific type of users of technology, who are on the leading edge of significant market trends. Within this context, respondents highlighted the baby boomer generation. This is an exclusive stage for retailers with experimental labs, where they can benefit from customer involvement for technology implementation process.
- 3) Large trade shows: large trade shows are primary used as mass marketing techniques. Here, engaging new/existing customers is a strategy to promote the technology. Senior managers, marketing managers and chief executives of the firm, participate in large trade shows in order gain insight into the latest trends and technological developments. This participation normally happens after a service has been well-established for a while, and the retailer is looking for a solution to innovate and improve its effectiveness.
- 4) Exclusive events by suppliers: it refers to tailored and specifically designed technologies aiming for a targeted market, where technology suppliers tend to invite retailers to their own events. This is managed by the sales managers in the technology supplying firm. Key informant 9 said:

"... The simple events are highly dependent on the depth of relationship between the supplier sales managers and the retailers, the sales managers open up a conversation about the latest technology that they have been working on particularly to improve the

supporting process. The discussion gets hot if the retailer has a specific service that goes well with that piece of technology ...”

- 5) Partnership with the existing technology suppliers: due to the level of trust and mutual understanding, the technology suppliers engage with existing retailers to show their current development processes.
- 6) Managerial workshops: real face to face events including leadership workshops with sales managers, marketers and top-level executives designed for particular challenges and opportunities, recent trends in retail technology developments, and how technology suppliers can help retailers solve a challenge.

7.3 STAGE 2: INVESTIGATION

The second stage of the implementation process highlights the importance of investigation. It primarily refers to obtaining further information about the technology. It creates a favourable or unfavourable behaviour of the firm towards the technology. The retailer moves through this stage if the retailer has already planned for innovating one of the key services. While for the innovation decision-making process, an individual may mentally apply the new idea to his or her presence; the investigation stage is the first step for a retailer to request for more information. Respondent 12 said:

“...Where the primary focus of the technology is on improving the efficiency, a formal process of business case development involving an RFI (request for information) can smooth the process to see where we are ...”

The investigation stage is the first step in understanding the key components and requirements of the technology to make it a better match for the relevant service, which is already in exchange with the customers. It starts with a simple, informal process where the retailer will submit an RFI (request for information). The RFI will be sent to two units, the existing technology supplier and the retailer's experimental labs. While, formally, the RFI will be sent to both members simultaneously, in practice, the retailer does the high proportion of the investigation by itself, before contacting the technology supplier. This is due the fact that the retailer has a perfect understanding of its service and its service innovation requirements. As the key informant 15 said:

"...Now regarding the buying cycle, most retailers will have decided on a technology (mostly a software solution) before they even engage with a technology vendor, because there is so much information available, they do their research online, blogs, etc., in many cases a software development is an easy solution for incremental service innovation too ..."

During the investigation stage, the retailer seeks information and messages that show a clear understanding of market behavior through interaction with its service. For instance, when Tesco was investigating the digital display technology as a replacement for price tags, they primarily considered information about the rate of response and the ability to be updated automatically by the technology. This was due to the firm's plan to change the prices during peak hours. In this sense, key informant 18 said:

"...This was about ten years ago when the software development was not like now; we were having discussions about 'time of day pricing' where you can go for launch time or just after launch to get an offer or discount on the sandwiches and drinks..."

The key task in this stage is to create a view of the business concept underlying the targeted customer value creation and envisioned offering. As such, the retailer is aiming for personalised service innovation exclusive to certain customers and regardless of the total value of the shopping basket. This is accomplished by identifying what value activities are required in innovating the services and how the activities are connected. Key informant 20 said:

“...To even personalised pricing, so a customer is walking around the store, because they know who you are, they have given you a personal price. Let's say this product is for 20£, but because we know you spend 100£ with us every month, we are going to let you have it today for 15£! Now some retailers are struggling to get their head around this. Do they go down this road to say that actually, the service innovation is to offer different prices for the same product to individuals rather than just saying an individual gets 10% off...”

This stage identifies the first steps of the requirements and preferences to deliver a defined and clear set of value preferences for innovating service. While, requesting information from an external technology supplier provides a new perspective, outside the traditionally explained value chain, retailers stay with their current technology supplier or their experimental labs for three reasons: 1) the nature of the industry, where firms are late adopters of the technology, 2) privacy issues, where in case the technology becomes a huge deal in the future, the retailer intends to keep it as a secret, and 3) the existing suppliers have a slight advantage for understanding the requirements of the retailer's plan for innovating services.

7.4 STAGE 3: PICK-UP

The third stage of the implementation process highlights the importance of selection. Pick-up stage refers to the beginning of firm's desire to pursue a technology more structurally. The third and the fourth stage of the implementation process (tender process) can happen simultaneously. The pick-up stage is essential for choosing between alternative strategies and prioritise activities. Here the retailer is quite certain about what type of service innovation plan they will pursue. This stage primarily involves the retailers trying to understand the requirements and any new additional feature. As key informant 24 said:

"... We provide a list of functionalities and requirements answering the questions like: can your technology doing any of these things? Can you give us a rough estimate? How does it help this particular service? By the way, in there, anything that your technology can do that we have not thought of that might be of use to us? Do you think it can be helpful for other existing services that we haven't thought of? ..."

The selection process highlights a rough estimate about firm's availability of resources. Here, there is a quick and inexpensive assessment of the technical merits of the project and its market prospects for innovating existing service. This is probably the first time the retailer makes a go or kill decision, as for whether to continue with their interest or not. Key informant 23 said:

"... The firms' decisions about selecting and deploying resources for innovating services are characterized as rational within the constraints of the market position..."

Setting objectives and selecting target activities also specifies the competitive field where the focal company will operate and compete in the future. At this stage, the retailer targets the appropriate individual as the key correspondent. As key informant 21 said:

"...If the technology can help people to get to queues quicker, they may go to store operations director; they basically try to identify a person to calls the budget with a sales marketing, chief executive etc. job title. So, if it is IT, then it will go to the IT director or chief architect or something like that..."

However, due to the nature of the industry, the pick-up stage is moving more towards incremental development and software technologies resulting in incremental service innovation ultimately. When respondents were asked about "How often/frequent is it that a firm would introduce a technology that completely surprises its competition?" they all pointed out that the market is too risky to select such a technology with massive change to their services. In this sense, key informant 22 said:

"...Hmmm, I think these days it's very incremental and baby steps, you know, it's not an Uber or Airbnb situation, there's very little new news you know, however, I'm not saying they are not investing, but the neck bottle is very narrow at this point of the implementation process...we try to stick to the services we already have and innovate very little in that sense.."

7.5 STAGE 4: TENDER PROCESS

The fourth stage of the implementation process is the most well-known step, tender process. The term refers to a sealed bid or offer documents submitted, containing detailed

information and in response to a request. During the implementation process of technologies, it refers to a request for information (RFI) through sending invitations for proposals aimed for specific services. The tender process is about active information seeking that usually takes place to answer critical questions about the technology its impact on service innovation practices. The tender process requires a deep engagement and providing an extensive set of information. As key informant 16 said:

“...The retailer asks us about extensive functionality and anything extra that we can add to the technology, or to the service using that technology, and we should put them all in the form of a written response...”

Considering which actor (i.e., the retailer or the technology supplier) benefits the most, the invitation for proposals happens through three specific roots (see Figure 7.3).

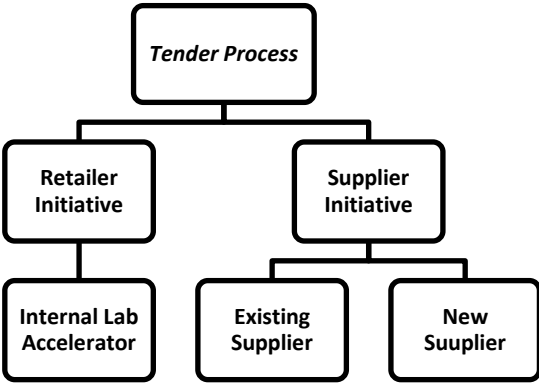


Figure 7-3 Tender process stage in the technology implementation process

- 1) The most common type is when a retailer makes contact with an existing technology supplier. They provide brief information about the technology and request for further information. As key informant 4 said:

“... A current customer comes to us saying we have got this challenge and we need a solution, here’s a service that we have been offering for a long time and we want your input on how to make better, can you give us a rough estimate and a list of all the functionality requirements? We then give them an estimate and they will probably check it with another competitor etc. ...”

While key informant 13 provided further details about the tender process involving existing technology supplier:

“...A customer contacts us because they experience a pain and have perceived the idea of their need. We suggest an analysis of one or more of their stores to study the problem further and through observation of the in-store service experience as well. The analysis consists of an interview phase with relevant employees involved in the service as well as an observation phase. Then we crunch this collected data and present it in a report. The report highlights the actual need, with suggestions about processes/policies that need to be changed/added/removed to innovate the service either incrementally or massively...”

In this type, the retailer is highly dependent on the technological know-know and the knowledge of the technology supplier. In this sense, key informant 17 said:

“...More and more these days, the retailer is in the pilot steps, where the retailer says, we want you to spend three months working with our store team to see how the service delivered works here... then give us a time and payroll solutions for the same store...”

- 2) Quite often it happens that the retailer is facing a problem with no existing technology supplier being able to provide an appropriate solution. In which case,

the retailer uses a subscription-based service-consulting firm, *Gartner, Inc* or *Forrester*.

Forrester is one of the most influential research and advisory firms in the world. They work with business and technology leaders to develop customer-obsessed strategies that drive growth. *Forrester's* unique insights are grounded in annual surveys of more than 675,000 consumers and business leaders worldwide, rigorous and objective methodologies, and the shared wisdom of our most innovative clients. Through proprietary research, data, custom consulting, exclusive executive peer groups, and events, the *Forrester* experience is a singular and compelling purpose: to challenge the thinking of our clients to help them lead change in their organizations.

Gartner, Inc. is the world's leading research and advisory company. The company helps business leaders across all primary functions in every industry and enterprise size with the objective insights they need to make the right decisions. *Gartner's* comprehensive suite of services delivers strategic advice and proven best practices to help clients succeed in their mission-critical priorities. The company provides an independent perspective on technology suppliers including software providers and system integrators. They provide a diverse range of information including software solutions as, *Gartner Peer Insight*. They also provide series of market research reports that rely on proprietary qualitative data analysis methods to demonstrate market trends, such as direction, maturity and participants as, *Gartner Magic Quadrant*. Key informant 12 said:

"...In Gartner and Forrester, they will have categories such as emerging technologies and what you often see is, they've got a requirement for a particular solution, and they go to

Gartner for loyalty solution, let's say, they can see six vendors, for instance, they choose them and send them the RFI..."

- 3) The third receivers of RFI are the experimental labs, which are controlled by the retailers. Many retailers have innovation projects undergoing in so-called, experimental or living labs. Both B2B and B2C innovation projects are confronted with a range of uncertainties throughout their development process. Retailers as the providers of living labs as a service – who offer services such as designing the idea-generation processes, planning or carrying out real-world tests of innovations, and assessing pre-market launches – are confronted with an ever-increasing demand for B2B oriented projects about implementing technologies and their future impacts on services. As key informant 13 said:

"...There's a huge investment by technology firms and retailers on experimental labs. Retailers help technology providers bridge the gap to the consumers. The consumers are mainly involved in the proof of concept stage, but the lab trends are a root for retailers to continue to act as a gateway to the consumers. The retailers will proactively invite the consumers into the lab to interact with their technologies and see how it affects their services ..."

7.6 STAGE 5: IDEA DEVELOPMENT

The fifth stage of the implementation process highlights the importance of a classic idea generation step. It refers to the process of developing and communicating ideas, which are abstract, concrete, or visual. The process includes the process of constructing through

the idea, innovating the concept, and bringing the concept closer to firm's capabilities and existing service innovation practices.

While for many firms this stage happens within the tender process, the research proposes the practices of idea development as a separate stage. During the interviews, many key informants highlighted that once a nominated supplier is working with a retailer, many new ideas come up that would not have happened before. For instance, key informant 22 said:

"... The case of broccoli cam was a simple idea of cameras in the ceiling looking straight down at the shelves to analyse whether a shelf is empty or not. During the tender process, we had many ideas developed working with guys in Tesco. With many improvements, we changed the technology to scan for empty trays of fruits and vegetables and send notifications to a member of staff to fill up the tray..."

The idea development stage is primarily based on the firm's capabilities including how they handle their service innovation practices. As a result, the retailer decides which technology features will be used, whether they will be used as is or with adaptations, how the technology will be integrated with other technologies the organization already has in place, how related organizational elements (e.g., structures, processes) will be changed, how the technology can result in improving the existing services, and how the organization will absorb and make use of the technology.

Furthermore, for many retailers the idea development stage and tender process represent an ongoing back and forth journey. The result of the idea development stage provides

further improvement to the proposal submitted by a technology supplier to a retailer. In this sense, key informant 18 said:

"...The extent of developed ideas helps us understand the retailer's expectancies of essential infrastructure. Once we know that, we can build our proposal around that central point. There is always a competition with other needed investments that may have a better proposal or idea. If our technology is new to a certain market/retailer, it is an uphill battle. Some retailers do see the adoption of new technologies as a competitive edge as it enables them to improve and innovate their services, so we try to identify those stakeholders when we study a market..."

7.7 STAGE 6: ENHANCEMENT

The sixth stage of the implementation process highlights the importance of enhancement. In this stage, the retailer is trying to achieve the ultimate results of the previous stage, idea development. At this point, the retailer submits a request for proof of concept to its nominated partners. The nominated partners consist of two members, where, in an ideal case, includes an existing (internal) and a new (external) supplier. In case the retailer benefits from experimental labs, the lab team would join the group of internal and external suppliers as well.

Providing a group of two or three partners (including the experimental lab team) gives the retailer the ability to achieve first mover advantage. This is also helpful as it enables the three partners to improve the existing service while aiming for service innovation considering the retailer's limited capabilities. Further, it offers the technology supplier the

ability to build a reference database for future enhancements, either software or physical development of the technology. As key informant 19 said:

"...Initially, we often need to explore and understand the actual value that a new technology will yield. Our approach has in many markets been to get the first 10-20 installations in with early adopters so we can build a reference install base. Often these are small businesses. Once we get there, it is easier to approach the major retailers, and we try to grow from there. It is also important to understand if the retailer is centralized or decentralized, like a franchise, or if it is a single owner of one, two or three store. So, we would have a better image of how they handle their services..."

As retail industry is a very transparent context, it becomes harder for retailers and technology suppliers to sustain a competitive advantage. Therefore, the enhancement stage gives the retailers the ability to consider different perspectives. Then, considering the firm's capabilities and their service innovation plan, the retailer can allocate the investment to the right processes and activities related to a particular service. However, so much of the decisions made at this stage, remain as an investment without getting to the final launch stage. Key informant 16 said:

"...Retailers are always looking for a leading edge, so, they are investing all the time. However, the retail is changing quickly, so it is difficult to stay on top. There should be an investment in new ideas all the time, but to roll it out, that's another issue..."

7.8 STAGE 7: APPLICATION

The seventh stage of the implementation process highlights the importance of application. In this stage, the extent of customization over software development reaches its highest level. The software update creates the continuous incremental changes required for service innovation development. At this point, the service innovation development, may as well, lead to the emergence of a new service because of constant incremental changes. For the big retailers, who are competing for the majority of the market, the role of experimental labs or lab accelerators plays a fundamental role in this stage. Regarding the importance of retailer's lab, respondent 19 said:

"... During the customization process happening after the tender, labs are beneficial regarding 1) roots to the market by starting up labs 2) how retailers are innovating in their labs 3) you never know all the ways for service innovation and it suddenly happen from the lab..."

Further, respondent 21 said:

"...You know the big boys in the top 10, they've got their own innovation labs, they've got robots walking around their offices, they've got hollow lens, artificial intelligence, they've got robots going up and down the stores working how to shelf stack at night so that you can just do without the labour and automatically..."

Since purpose of this stage is to provide incremental innovations mostly through software development, it happens through five different forms (see Figure 7.4).

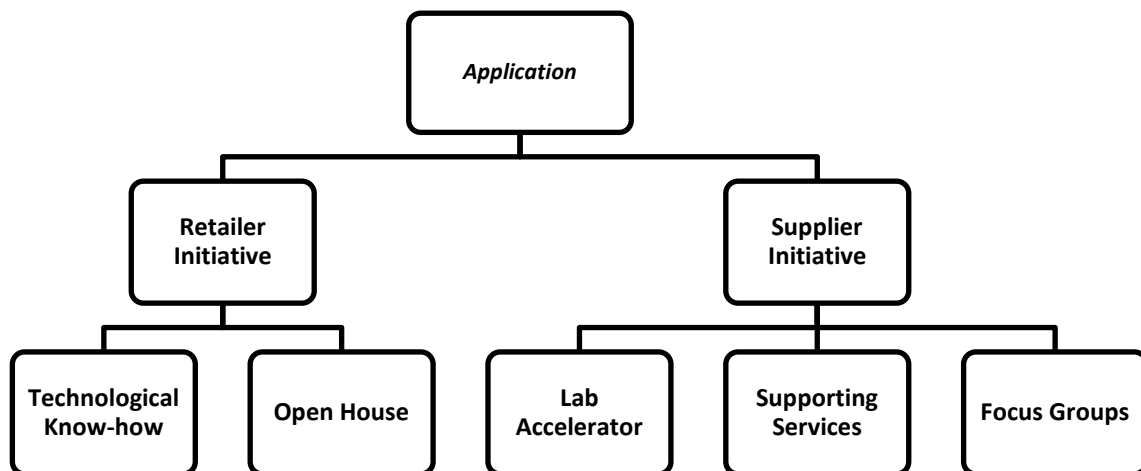


Figure 7-4 Application stage in the technology implementation process

- 1) Retailer’s innovation labs or often called experimental labs, where different technologies are tested, and there is a constant investment in software and technology development. While service innovation development does not provide any protection for the firm, this form highlights the importance of technological know-how for the retailers as in many cases the outcome leads to intellectual property development. However, much of these investments may not get to the final rollout, but it would not stop a retailer from continuous investment on research and development. Key informant 4 said:

“... Interestingly, the thing that constrains the retailers to roll out a major development from their experimental labs is a legacy system that exists. So, they know what they want to do, but it would take three months or even six months to actually integrate the new solution into the spaghetti of their old systems ...”

Further, key informant 23 said:

“... Imagine like Domino’s pizza can offer tracking service for online orders. Things like when you are gonna get it etc. Moreover, yet, firms as big as Tesco cannot even do such simple task for online delivery, even though they are the largest retailer in the UK...”

- 2) Supporting services provided by the external suppliers. These refer to incremental software developments, which are outsourced to external suppliers. The small and medium-sized SMEs are flexible regarding development activities and offer the convenience when the intellectual property protection does not matter. Key informant 17 said:

“... SMEs can overcome their lack of scale by maximizing various partnerships in the market whether it’s for technology development or innovating service. This has introduced new opportunities for them to take advantage of efficiencies that historically wouldn’t have been available due to price restrictions ...”

- 3) Lab accelerator or also known as living lab, which refers to where a retailer and a technology supplier cooperate for the same goal. This B2B partnership traditionally has faced a couple of issues including i) process integration, ii) technological complexity, and iii) target identification.

When key informants were asked about the challenges, overlapping information was observed. For instance, when asked about process integration, key informant 21 said:

“...Within the implementation process, technological integration is always required between the service innovation and the existing processes. If integration is required, the retailer needs to make a larger commitment to adapt existing processes in the firm, and the IT team needs to be included in the project, which leads to higher project complexity...”

For technological complexity, key informant 3 said:

“... Supplier and retailer have different resources you know... when the technology is highly complex, and the user researchers do not have a deep background or expertise on these innovations, it is difficult to understand the technical needs of the users. For that reason, it is too difficult to test the concept in a field study because the user researchers would encounter difficulties in being the translator between the supplier and the consumer...”

4) Many retailers and technology suppliers benefit from a service known as “active labs”. The concept of “active labs as a service” gives the firm (either the technology supplier or the retailer) the ability to observe real-life customer experience before the final release of the technology. It also enables the retailer and the technology supplier to observe customer interactions with the improved and innovated service. This facility, which is also known as “open house”, is primarily aimed at involving the mass consumers to test the technology before the final rollout. Key informant 16 said:

“...We use our open house facilities for different purposes; sometimes we use it as a showroom and present the prototype of the technology or how it works out with the service. However, most of the times, we have customers come in to interact with the technology and give us feedback...”

While “open houses” is based on observing customer experience with the technology and service, the selection of the customer groups requires further understanding of the target market. The identification and the selection of the target market were mentioned as a barrier by many respondents as key informant 18 said:

“...The difficulty in identifying the testers and the right target market rises due to a small pool of potential testers. If the supplier has been doing it for a while and if the retailer has innovation experience, there's always disagreement about choosing the target market. Normally, the technology supplier wants to push it further for technology-savvy consumers, but the retailer likes to go for the mass market...”

5) Focus groups for active labs as service, which is a technical open house facility.

While the open house facility is primarily designed to offer customer experience to the mass market, this type involves the integration of focus groups or lead user involvement. Key informant 6 said:

“...The way we professionally integrate particular segment of the market is a structured approach for the user involvement in our lab facilities. We use a combination of interviews with the lead users or focus group activities...”

When the key informants were asked why they chose focus groups or lead users instead of aiming for the majority of consumers, similar perceptions were observed. As key informant 1 said:

“... Involving lead users or focus groups makes it easier to respond to the needs of the users in later phases and contributes to a successful adoption of technology. Lead users continuously look for new and innovative services. This approach is beneficial because even future customer needs and wants are also incorporated before the technology is in its final form or launched...”

7.9 STAGE 8: IMPACT

The eighth stage of the implementation process highlights the importance of impact. The primary objective of this stage is on budget allocation and total cost estimation. This stage starts with activities such as estimating the return on investment (ROI) and total cost of ownership (TCO). The two factors include the cost estimation for the use of technology and, in some cases, the changes to the service. Since the retail market is facing a new challenge regarding improving customer experience and offering the right technology at the right time and place, the importance of ROI is becoming more evident than any other time. In this sense, key informant 8 said:

"...Because the retailing market is moving so quickly, I just think they want the payback quicker. Like in financial services or utilities or transport they may say, ok we accept eighteen months return on investment, but in retail, after having to work for 20 years, I say give it three months, because they want it quick..."

Further, since the retail market is moving towards shorter times for ROI, many technology suppliers are adopting the start-up mentality where they avoid investing in large-scale projects. As a result, they focus on incremental changes to the technology and the service ultimately. This approach further highlights the importance of the application stage, where the retailer and the technology supplier focus on incremental innovations through software development. Key informant 16 said:

"...The reason I am saying that is because there's a lot of organizations saying, we do not do big technology projects anymore, we want to sell fast, we want to have minimum viable products in. In another word, they are trying to take on the start-up mentality like all

organizations that have the flexibility and shortage performance. Technology suppliers are like, we are gonna drop-code every four weeks, and we are gonna demonstrate value to the business and our customers...”

Aside from considering the ROI in a short period, which may go up to four months, the total cost of ownership (TCO) plays an important role within the impact stage. While service innovation development is always a beneficial factor for the retailer, considering the total cost of ownership, four elements have direct effect on the supplier initiative during the impact stage (see Figure 7.5).

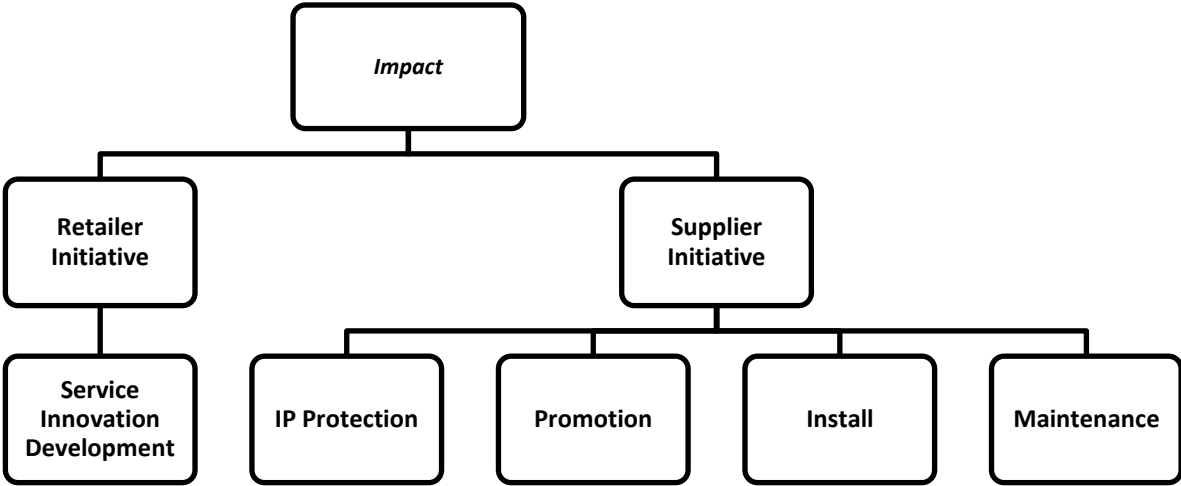


Figure 7-5 Impact stage in the technology implementation process

- 1) Intellectual property protection: the recognition that intellectual property rights lubricate the market for technological know-how shows that IP protection should be considered for TCO. However, the nature of the retail sector is changing so fast that the technological know-how, if achieved by top retailers with enough access to the required capabilities, can be easily and quickly replicated. The IP protection

becomes more important for TCO since it defines the extent of change and adaptation for the retailer. In this regard, key informant 4 said:

"...Historically, the US marketplace, has got a mindset where we won't change the technology, we'll purchase a technology and change our processes to fit the technology. However, in the UK since the 15-20 years ago, technology suppliers and the retailers would bespoke, they would modify the technology to fit the processes, and then when it comes to upgrades and things like that, it's already a nightmare and a technology with IP protection makes it even worse..."

2) Promotion: the cost of promotion is further a challenge that technology suppliers face as in some cases they are obliged to cover the cost of promoting and introducing the technology, particularly if the technology does not offer a major innovation. The issue becomes more challenging if the supplier is required to fit the technology to service innovation rather than vice versa. Key informant 7 said:

"...When a retailer is the first in the market to implement a technology, the technology supplier covers the costs of promoting the technology to a small portion of the target market. Normally, the first retailer to trial a technology offers the cost coverage for a short time. However, because of cross-fertilization, where the one firm easily finds out what its competitor is doing, after a while the technology supplier is in charge of the promotion cost..."

3) Install: a key part of the TCO process involves the instalment as it could vary depending on the number of stores required. Key informant 8 said:

“...A common approach to clarify the total cost of ownership is to get the first 10-20 installations in with the early adopters so that the technology provider can build a reference install base. This also creates a knowledge database about the TCO cycle for the technology provider...”

4) Maintenance: although the instalment of the technology during the implementation stage is for a short period of time, the costs of deploy and maintenance will be included during the impact stage. In this sense, key informant 11 said:

“...It always goes down to how they are going to measure return on investment and what kind of investment they are going to get proportional to the original cost of the technology including the cost of maintenance, which is estimated before the rollout...sometimes what they count is how much customers engage with the service...”

7.10 STAGE 9: ROLLOUT

The final stage of the implementation process highlights the importance of rollout. It refers to the formal launching of the technology with media fanfare and following a promotional campaign. Sometimes the rollout of a technology happens through introduction of a new or improved service. This stage signifies the point at which the retailer starts the adoption process of the technology. Although the final stage of the implementation process can result in adoption or rejection, the adoption or rollout stage requires a more comprehensive design and strategic planning than the rejection.

Traditionally, the rollout stage includes the announcement of the adoption of technology, in a way that is available for the majority of the consumers. However, in the retail context, in many cases offering a new service or improving an existing one efficiently and effectively replaces the rollout stage. It highlights the idea that is included in service innovation development, which is, continuous and incremental improvement to a service may result in the introduction of a totally new service. A key strategy to reveal a technology by offering a service, in a way that improves the operational efficiency and effectiveness while creating the lock-in effect. In this sense, key informant 18 said:

“...Sometimes, I do not think that they market the fact that they have got some fantastic technology. The way it takes place is that they will say, we will do next-day delivery if you order by midnight, then you will get it by midday tomorrow. Through offering such a service it will show itself and everyone will scratch their heads and go like: shit... how can they do that? What technology do they use?...”

While different services require different technologies, the impact of marketing a technology becomes more evident when a technology is used to offer a diverse range of services. For instance, a technology supplier can offer a unique ERP algorithm to a retailer as a result of providing operational efficiency for the management of the supply chain systems. Therefore, the retailer can benefit from using this technology for services such as “next day delivery” or “click & collect”. But, the competitive advantage of this type does not result in a market leadership or if any; it is for a short period.

As discussed in chapter 4 and 5 when developing the conceptual frameworks, in appropriability regimes, technology can result in competitive advantage and market

leadership position. The market leadership maintains for a period depending on how specialized the technology is as it makes it harder for competitors to replicate. However, as proposed within the conceptual frameworks and although many technologies within the service sector in general and the retail sector, in particular, are specialized, they provide a limited advantage for the retailer and can be duplicated by competitors easily.

A fundamental solution to this challenge, where the retailer can maintain its market advantage for a more extended period is when the same technology is used to offer different services. In this manner, the retailer can benefit from customer engagement while achieving customer lock-in. Using one technology in a manner that leads to a combination of services can improve the operational efficiency and effectiveness as well. When the key informants were asked about how using one technology for different services can maintain the market advantage, respondent 25 said:

“A customer can add many products to their shopping basket and checkout at once, but that does not mean the order will be delivered within one delivery service. If you took Argos for instance or any retailer, you order a bed, a barbeque and some kids bike... but, the retailer will never be able to deliver all of that in one order, because of their supply chain systems. They also come from different depots, which makes a one-time delivery even harder. However, if the retailer can deliver that order within one van or one day and within a few hours, everyone will go like Christ!! How have they done that?!...”

7.11 CONCLUSION

The demonstration of information using process data may involve manipulation of words and perceptions in a way that link to the storyline (Huber and Van de Ven 1990). The

presentation of the technology implementation phase in the form of a process model provides various benefits and challenges for the research. The technology implementation process (Figure 7.1) allows the delivery of large quantities in relatively little space. In this sense, the process model could be helpful for the development and verification of theoretical ideas ultimately (Ritchie et al. 2013). Further, the implementation process model allows the demonstration of different dimensions, the involvement of multiple actors (i.e., the retailer and the technology supplier), actor's preference, and parallel processes. This type of drawing obviously is not a theory but an intermediary step between the raw data and a more abstract conceptualization (Langley 1999). To move toward a more comprehensive understanding, one might, in future research, combine the implementation and adoption stage and look for common sequences of practices as well as involvement of all the actors. For example, the focal firm, the upstream supplier, and the downstream consumer.

Different forms of process mapping have long been used by organizations to plan, understand, and correct their work processes. The implementation process discusses the need to detect the underlying practices promptly. The practices highlight that different stages must be undertaken one by one or in group forms and with a repetitive process. As in an ideal process model, the technology implementation process requires many observations of similar and overlapping activities. This indicates that the roadmapping strategy used to present the implementation stage may be most fruitful as the first step of a theory development for the analysis of different cases and technologies. The process model in this research as in many process maps allows the preservation of some dimensions of data ambiguity but excludes others (Dubois and Gibbert 2010). For

instance, Figure 7.1 does not offer in-depth clarity on the identification of the central unit of analysis. However, it conceptualizes the technology implementation as an evolutionary phenomenon that interacts dynamically with different issues crucial to the two actors involved in the process. In fact, the range of possibilities for mapping a process model depends on the researcher's objectives and creativity (Pentland 1999). Although the delivery of the technology implementation process provides simplicity and ease of understanding, it may be biased toward the representation of certain types of information.

The process model presented in this chapter shows the complete processual analysis for the implementation process of technologies in the retail sector. This model comprises of nine unique stages. While some firms go through the nine stages, some others may choose a shorter implementation process with fewer stages. However, the core activities in this process model remain the same. The results presented in this chapter deliver the answer to the first research question as to what are the processes and practices for the implementation of technologies in the UK retail sector? The results also create a need to answer the second research question to understand how retailers create value for their services during the implementation process of technologies in the UK retail sector.

Finally, there are a few concluding points that result from the development of the technology implementation process model. First, the implementation process of technologies is closely linked to the key activities that are performed, how well they are achieved, and the completion of the process. How the technology delivers value and contributes to the practices of service innovation development, are considered in the success equation of the technology implementation process. However, the outcome of

the implementation project, to some extent, is in the hands of the people who move the project from absorption to rollout. Second, technology implementation process is a deficient model. That is, although many managers (mainly retail managers) believe to have a systematic process of implementing technologies, what happens in practice, shows many gaps and deficiencies. As such, a few implications can be observed. 1) technology implementation process: the critical and multidimensional nature of the activities, actors, and practices involved require the need for a comprehensive action plan, which clarifies the role of each actor exclusively. 2) a need for adjustability: the technology implementation process is only half the road. Customizing the model in a disciplined means, which links to the business model and capabilities of the retailer is the second half. 3) Particular activities with precise focus: specific activities might be left out. This is particularly the case when some stages include subsets. Although the impact of these activities might be considered weak and fragile, yet they are strongly associated with the success of the technology implementation model.

CHAPTER 8 FINDINGS: 9 CASE STUDIES IN THE UK RETAIL SECTOR

8.1 INTRODUCTION

The purpose of this Chapter is to introduce nine 'illustrative' case studies identified by interviewees in Phase 1 of the primary data collection. Case studies portray a portfolio of technologies, which have passed the implementation process or are being implemented by the retailers in the UK. The selection enabled the researcher to use a diverse range of technologies in the UK retail sector. These technologies are presented as a matrix of technology spectrum in Figure 8.1. The researcher tried to present a comprehensive range of technologies starting from very high to shallow performing cases. In doing so, cases were sampled from different technologies in the UK retail sector. A total of 28 cases were collected and categorized into nine groups (see Figure 8.1). The diversity of technologies and services offered in the UK retail industry enabled the study to provide richness and theoretical insight. In doing so, a polar-type sampling approach, in which a researcher uses a diverse and extreme range of samples, was used. The examples are selected from very high to very low-performing cases to better observe internal and conflicting patterns (Eisenhardt and Graebner 2007). The result of polar-type sampling approach can frequently surprise reviewers as the empirical evidence is continuously supporting the theoretical outcomes (Siggelkow 2007).

Next, building on common techniques (Creswell 2013), the research used theoretical sampling strategy to facilitate the generalization and offer theoretical insight (Hillebrand et al. 2001b). This sampling approach has two stages: (1) Researcher selected a handful of broadly homogeneous cases preferably within the same context (in this study, all cases

were/are involved in technology implementation process in the UK retail sector); and (2) cases are selected with the viewpoint that they can enrich the emerging theory (Eisenhardt and Graebner 2007) through contributing to the literature on technology value-creation and service innovation development (as presented in chapter 3, 4, and 5). Therefore, in the first stage, nine cases were selected because of their strong market position and importance for service innovation in retail. After initial analysis, the remaining cases were selected considering their possible contribution to the emerging theory and how they can create value for a retailer with regards to value appropriation and value co-creation (Figure 8.1).

The case studies presented in this chapter are selected among those that have passed the implementation process successfully or are currently going through this process (Figure 8.1). The case study begins with a brief introduction of the value drivers, to which the technology is linked. Next, the importance of the technology and its value drivers are briefly explained. Each case study provides a brief introduction to the technology company, within which the case is studied. Essential skills and capabilities of the firms are mentioned. If necessary, the key challenges that the retailer is facing, are stated. This is followed by a description of the crucial interactions between the technology supplier and the retailer. Next, the way, in which the supplier's and retailer's knowledge and capabilities helped the implementation process in terms of creating value and innovating services are illustrated. Finally, at the end of each case study, the key features and benefits of the implementation process are explained. The improvements and added features that would not have occurred before the implementation process, now stand out as an advantage of the implementation process for each technology (Figure 8.1).

Value Appropriation

	<i>Payment & Point of Sale</i> <ul style="list-style-type: none"> ○ Biometrics ○ Browse & order hub ○ High tech checkout ○ In-store coffee machine ○ Mobile payments ○ Scan as you shop ○ Self-service checkout ○ Vending machine 	<i>Scheduling Program & Product Management</i> <ul style="list-style-type: none"> ○ Display fridge ○ Online stock availability ○ Tray cam ○ Video marketing 	<i>Management & Workforce Systems</i> <ul style="list-style-type: none"> ○ ERP 	
Operational efficiency				
	<i>Internet of Things</i> <ul style="list-style-type: none"> ○ Cloud services ○ Digital signage ○ Electronic shelf labels ○ RFID 	<i>Data Analytics & Ecommerce</i> <ul style="list-style-type: none"> ○ Product Customization 	<i>Warehousing & Fulfilment</i> <ul style="list-style-type: none"> ○ Channel synthesizing tech 	
Operational effectiveness				
	<i>Customer Experience Management</i> <ul style="list-style-type: none"> ○ Beacon tech ○ In-store touch screens ○ Mist technology ○ Mobile apps ○ Virtual standoff 	<i>Shopper Analysis & Loyalty Programs</i> <ul style="list-style-type: none"> ○ Loyalty cards ○ 3D printing 	<i>Portable Hardware</i> <ul style="list-style-type: none"> ○ Dash button (Amazon) ○ Hiku (Waitrose) 	
Customer lock-in				
	Customer Engagement	Customer Preference	Channel Evaluation	Value Co-Creation

Figure 8.1 Matrix of Technology Spectrum

8.2 CASE 1: PAYMENT AND POINT OF SALE

The following case study will explore an example of the type of technologies that deliver operational efficiency through engaging customers (see Figure 8.1). It illustrates the importance of biometric technology for the retailers. With cross-border travel, crime and fraud now more accessible than ever, biometric technology offers a more efficient way of reliably identifying individuals, tackling criminals and managing security threats for the retailers (Zhang et al. 2016). In this case, the technology supplier (Sopra Steria) provides

the biometric application and expertise for its retailer, Tesco. Sopra Steria is a technology supplier with a diverse range of technologies and services performing in the UK. Steria AFIS (Automated Fingerprint Identification System) offers the retailer high-speed searches for higher efficiency.

Sopra Steria's biometric applications and expertise supported drastically increase efficiency through the automation of communication between end users with several AFIS solutions. This enables the retailer to interact with the consumer at a higher and more efficient speed rate. It further facilitates service innovation development through the introduction of reliable and secure software platforms. The need for service innovation development (i.e., service innovation in retail) to reliably manage identities for security and authentication purposes is growing on a daily basis (Hammerschmidt et al. 2016). Biometrics hold the key for technologies that impact service innovation development in terms of efficiency, accuracy and speed of interaction (Hino 2015). Typically focused on fingerprints, the constant drive for improved accuracy while handling higher transaction volumes is creating a trend towards multi-modal biometric solutions, such as those offered by Sopra Steria. These include face, iris and vein recognition technologies.

One of the critical areas of focus for retail in the months ahead looks set to be the development of in-store analytics to understand customer behaviour in the physical retail store (Zhang et al. 2016). Online retailers have been able to track shopper activity using online accounts and cookie monitoring for some years. But, the emergence of biometrics technology may allow for similarly comprehensive analysis of in-store customers while it boosts accuracy and security within the delivery of a service.

In this case, the technology supplier presented its face recognition tool, which includes a system that can estimate people's age based on face footage. Tesco and Sopra Steria have been implementing this technology multiple purposes. For instance, the biometrics system is used as a way of monitoring the type of consumer who enters a store and buys an item versus those shoppers who walk out without making a purchase (Mahar et al. 2014). The system, which uses facial recognition technology and can determine a shopper's gender, age and other basic demographics, is being marketed to retailers as a way of helping them deliver more measured campaigns and provide tailored on-screen advertising to consumers.

The collected data as a result of facial recognition is sent to the technology supplier. From this point, the supplier collates the information to establish a pattern of consumer shopping behaviours. While the implementation process for this technology is still undergoing, Sopra Steria offered a comprehensive portfolio of features, services and regulatory advice to support the transformation of the biometrics systems for Tesco.

These include:

- SteriaAFIS: a back-end solution for the storage and biometric matching of fingerprints in large databases is fast and accurate with immediate results.
- SteriaFITPlus: quick and reliable capture, review and transmission of all print types, latent and mugshots.
- SteriaFITMobile: taking rapid capture, identification and transmission out on the road.

- Biometric Data Capture System (BDSC): verifying identity reliably and quickly at critical access points.
- Biometrics business logics: defining the workflow structure of biometric solutions you need, ensuring your applications are used as efficiently as possible.
- AFIS consultancy services: helping the firm with the key identifiers for their AFIS system and, by drawing on an extensive market knowledge, recommending the most appropriate solution.
- Compliance: ensuring the retailer has the technical capability to transmit information for service innovation development and in line with national and international technology requirements for sending and receiving data.
- Architecture: providing guidance on the architectural design of your biometrics solutions.
- Integration: integrating biometrics solutions with your existing internal or third-party solutions and managing a wide range of interfaces with other agencies.
- Operations: how to maintain and support large and complex biometrics solutions.

The partnership between Tesco and Sopra Steria started while implementing biometrics systems for security and staff management purposes. During the application stage and due to Steria's comprehensive portfolio of services and technology, the firms engaged in a new project. This project established the retailer's payment service to compete with the current contactless and mobile payment systems like Apple Pay. The partnership project was a new payment technology called PayQwiq. Tesco's PayQwiq users can present their

mobile phone at the checkout, where the cashier will scan a code to instantly take payment and add loyalty points to the shopper's loyalty card account through the digital wallet (Tugby 2016). The PayQwiq app is supported by the Tesco bank. Following that initial pilot, which sources said lasted "a couple of months", Tesco is now extending the scheme to around 500 stores within the M25. Through the impact stage of the implementation process, the grocer sent emails to its 600,000 inviting them to download and use the app as part of the next phase of the rollout.

After the initial rollout, the partnership extended again for a new implementation project. The firms unveiled Pay+, a new mobile payments app, which aims to make shopping trips more convenient for customers looking to pay using their smartphone. The app, which replaces PayQwiq, provides customers convenience at the checkout with a simple payment method, as well as the ability to automatically collect loyalty points with a single swipe.

Key features and benefits of the implementation process:

- To focus on the privacy issues through providing assurance that the information held on the supplier or the retailer's biometric database will not be integrated with other potentially sensitive or confidential personal and financial data on large databases. The action further improved the quality of service innovation development as well (Evanschitzky et al. 2015).
- The implementation process will take a more extended period than expected. The acquisition and installation cost of biometrics at different levels will decline over

time as the technology finds increasing applications and different impacts on service innovation development.

- The implementation process resulted in an extended partnership to use Steria's biometrics systems for payment technology.
- To develop an exclusive solution known as Biometric Data Capture System (BDCS), which is the result of supplier's technological know-how for biometrics systems. The solution is designed to verify identity and faster delivery of the service. BDCS uses multiple biometric criteria to check and guarantee the identity of an individual, either consumer or employees.

8.3 CASE 2: SCHEDULING PROGRAMS AND PRODUCT MANAGEMENT

The following case study will explore an example of the type of technologies that primarily deliver operational efficiency and assortment preference (see Figure 8.1). It illustrates the importance of video marketing technology for retailers. It shows the implementation process for technologies highlighting the interactions between the technology supplier and the retailer with the primary focus on operational efficiency and understanding assortment preference. In this case the technology supplier (Amplience) provides a unique video marketing technology for its retailer, Boohoo.

Boohoo, one of the UK's leading online fashion retailers and known for its practices of service innovation is one of the best customers using video capability. It uses the Amplience Content-as-a-Service platform to create efficient digital commerce experiences. Through improving the commerce experience, the retailer can have a better

understanding about the customer's preferred choice and its related service innovation development (Emrich et al. 2015; Patrício et al. 2011). The technology also enables them to visualize the content of the product efficiently. The customer's familiarity with the online video marketing improves the customer understanding of the product (Murray et al. 2010). It further brings efficiency, since the retailer does not have to provide extra and unnecessary information on the website (Emrich et al. 2015). Furthermore, the realization of customer's needs, which avoids customers' distance driving to a physical store, improves assortment preference, creates value and impacts service innovation development (Grewal et al. 2010; Mantrala et al. 2009).

In this case, Boohoo drives commerce revenue with the addition of innovative Ampliance video marketing solution. The Ampliance Big Content cloud technology improves efficiency by delivering rich content production, analytics and publishing capabilities. The technology supplier works with an experienced customer success, solutions team, and detailed high content index benchmarking. The partnership enables more than 200 of the world's leading brands to realize measurable content performance improvement.

The Ampliance platform supports Boohoo in the creation and distribution of cost efficient web content, for the retailer's website, from lookbooks to product detail. Using web templates and downloading functionality Boohoo can make the most of its stunning visualizations across all its eCommerce channels. This further delivers benefit to the firm through value co-creation. It proved invaluable information to understand the customer's preferences further as well. The Ampliance solution offers Boohoo TV channel the ability to deliver high-quality video content. The TV channel can quickly and easily improve merchandising, by showing product collections in parallel with the video content. The

Content-as-a-Service platform offers product features continuously and in parallel with other features.

Previously video has been mainly a passive experience with little interactivity and has been typically used at the product level to increase engagement (Nault and Dexter 1995). The Ampliance solution enables products to be shown alongside the video while it plays using editable cue points. The implementation of this unique technology vastly improves efficiency through merchandising possibilities across the site (Herhausen et al. 2015). Boohoo chose Ampliance for its UK site for multiple reasons. Ampliance Dynamic Media significantly reduces the time and cost of uploading new collections and making modifications to existing media content. It also improves the on-page conversion rate by delivering a rich, engaging visual experience including zoom and 360-spin. Lastly, Dynamic Media also enables the optimisation of images for different channels - such as for mobile or tablet - by allowing different versions of the image to be drawn down from one high-resolution master asset. The technology further, enables the customer to download the video linked to the product. Downloading the video improves the quality of the knowledge database for the retailer as they have a better understanding of the customer's assortment preference.

According to key informants 12:

“Ampliance has enabled us to design much more creative, cost and time efficient content for the site. We’ve invested in our eCommerce proposition and have been rewarded with high levels of efficiency and market understanding.”

Boohoo has already realized impressive results: Compared with the wider Boohoo.com site, Boohoo TV video merchandising content raises average order values by 17%.

Key informant 14 said:

“The Amplience solution is unique and has given us great results in our ability to merchandise our products better, most significantly understanding new visitors. Amplience understand retailer’s needs, and this latest platform solution help us provide efficiency and better engage with our audiences.”

The new video marketing technology provides elegant and efficient integration while refining the quality of the firm’s knowledge database, which has an impact on service innovation development as well (Rose et al. 2012). It also delivers ease of use for both ecommerce and marketing teams. It lets them enrich the market understanding with images and videos that work responsively in any channel and device combination. This content can relate to both products and promotions.

Key features and benefits of the implementation process:

- 17% increase in AOV (average order value)
- 67% of all customers were new customers
- Reduced content management time & cost
- Higher levels of understanding market behaviour
- Increased online sales

8.4 CASE 3: MANAGEMENT AND WORKFORCE SYSTEMS

The following case study will explore an example of the type of technologies that primarily improve operational efficiency and channel evaluation (see Figure 8.1). It illustrates the importance of management and creation tools used by different teams in a firm. The technology enables the retailer to improve its operational efficiency through connecting different groups together. It shows that the implementation process of technologies improves the communication time between marketing and eCommerce team. This also results in faster and reliable service innovation development. Meanwhile, the technology enables the retailer to design and develop visual content for different channels (Clement et al. 2013). In this case, the technology supplier (Amplience) provides an integrated management system using cloud solutions. The Amplience Content-as-a-Service (CaaS) platform integrates with the sales force commerce cloud platform to provide marketing and eCommerce teams with powerful tools and capabilities for creation of online shopping experiences over different channels. The technology further enables the retailer to connect with its consumers on various channels including the visual, mobile, and social web (Brynjolfsson et al. 2013).

Unlike the other content solutions provided by technology suppliers within the UK market, Amplience is built in the Cloud. The supplier offers an application-programming interface (API) first, which enables seamless integration with the Salesforce Commerce Cloud Business Manager. Using the solution, it is simple for team members to create compelling new content that drives high levels of efficiency and conversion on multiple channels. While digital content drives online conversion and influences over 60% of all sales, the

best performing technologies integrate rich and inspirational digital marketing content. Here, the core eCommerce product and promotional data create shopping experiences that work responsively across devices and simultaneously communicate with the related team. The Ampliance Rich Media and Content Authoring Cartridges extend the content and media production tools available for eCommerce teams using Salesforce Commerce Cloud, to facilitate production of the entire key content types that drive conversion.

For the retailers, blogs and articles content tells the brand story, but until now this material was relegated to a separate domain, often orphaned from the main navigation and infrequently viewed (Verhoef and Lemon 2015). While most of the customers never interact with the article and the blog content because it lives on a separate system and is an add-on to the core customer journey. With the Ampliance Content Authoring tools and the Salesforce Commerce Cloud integration, this rich content can be integrated into full, or in abstract, throughout the experience whether viewed on the big web, mobile site or in-App (Figure 8.2).

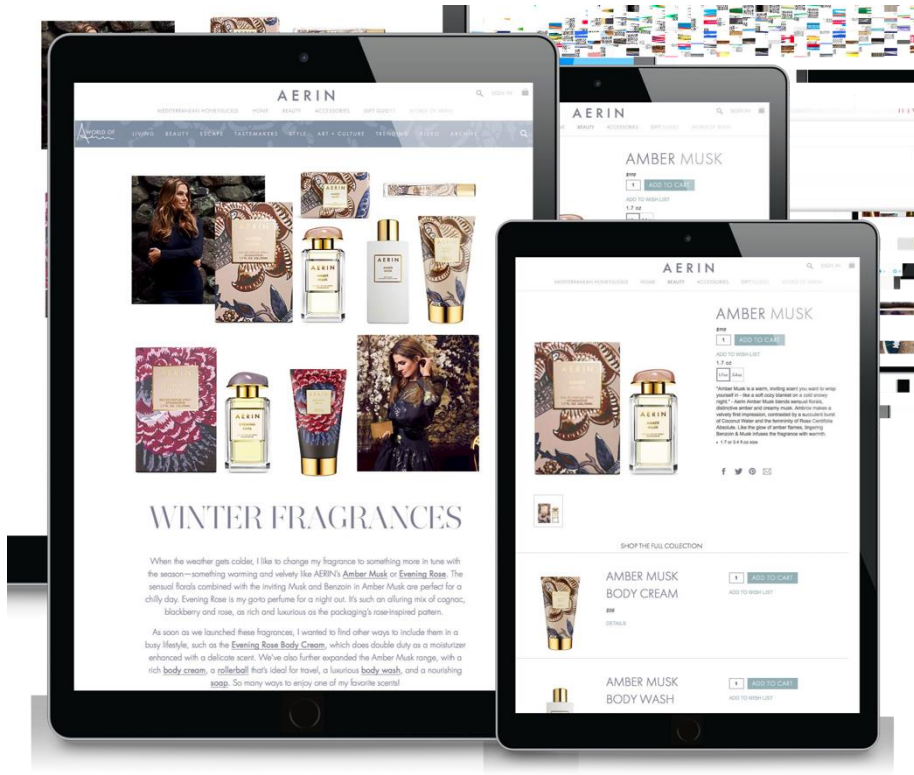


Figure 8.2 The Integration of Rich Content over Multiple Channel

Making marketing media easy to shop allows eCommerce teams to efficiently and simultaneously deliver smooth shopping experience over different channels (Figure 8.3). By enriching images and video to create interactive merchandising content with live product and calls-to-action, retailers can take visitors from inspiration to purchase in one click on their desired device as a new method for service innovation development. The Ampliance Salesforce Commerce Cloud integration enables shoppable media created using the Ampliance Authoring Studio to be selected, reviewed, and published from within the Salesforce Commerce Cloud Business Manager. The combination includes access to product data from the Salesforce Commerce Cloud Open Commerce API (OCAPI) to integrate data into the module from the product catalogue.

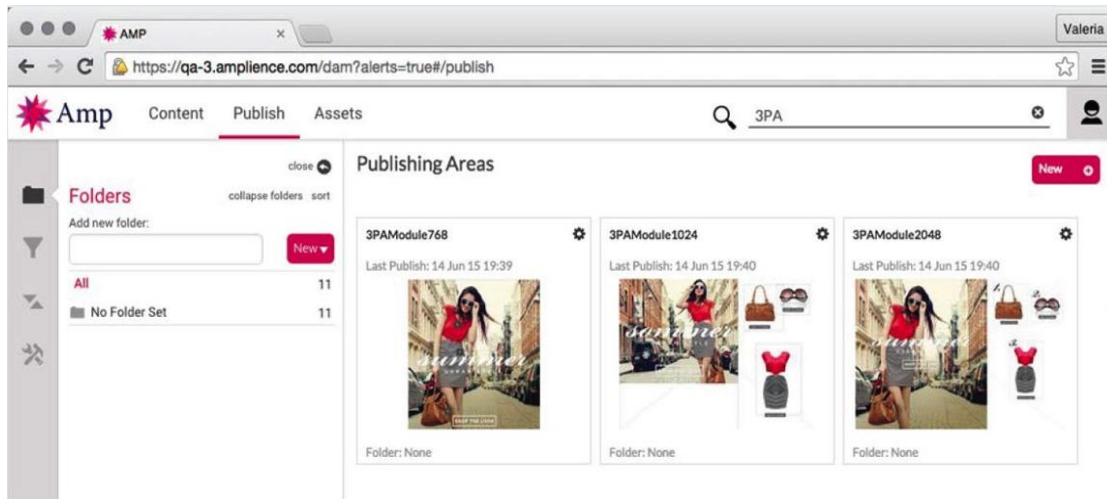


Figure 8.3 Providing Smooth and Customized Shopping Experience

The solution automatically processes additional parameters, such as configurations to support responsive and mobile or online first experiences, ensuring creative teams can focus on media production – not complex content integration and code. With multi-device customer journeys making up the majority of customer interactions, eCommerce teams must create experiences that flow seamlessly into many different screens, and that is optimized for bandwidth and locale in a fast and efficient manner (Figure 8.4). Responsive websites and apps require images that can be dynamically adapted for size, quality, and be cropped to a Point of Interest, to suit the device resolution and aspect ratio.

Salesforce | Sandbox - amplicne02 | Salesforce | Merchant Tools | Administration | Storefront | (Admin Admin)

Interactive Merchandising

Available | **Imported Publishing Areas** | Grouped Areas

Search
Name or ID: Find

Select	Preview	Publishing Area ▲	Published Date	Associated Module	Width	Height
<input type="checkbox"/>		3PAModule1024 GUID: 299aa7c4-9170-4867-8457-c5ac4223830f	Fri, 12 Jun 2015 00:26:59 GMT	3PAModule1024	1024	750
<input type="checkbox"/>		3PAModule2048 GUID: afd05c68-dbd6-47ec-ae59-219171d5c40	Sat, 13 Jun 2015 22:44:54 GMT	3PAModule2048	2048	1400
<input type="checkbox"/>		3PAModule768 GUID: e5b0e781-571b-4d83-a5e9-ae67a72fac6f	Thu, 11 Jun 2015 23:06:37 GMT	3PAModule768	768	830

Figure 8.4 Adding External Parameters to the Product Template

With Ampliance, images can be controlled through Transformation Templates, enabling design and marketing teams to control all image parameters without changing a line of code. Ampliance tools like Point of Interest enable creative Art Direction via metadata – meaning that an essential part of an image is always served, regardless of device or screen size (Figure 8.5).



Figure 8.5 Delivering Rich Content Over Different Channels

For video, using Ampliance’s powerful Video transcoding APIs, creative teams can upload a single, high definition, master video asset, and then transcode all the multiple versions required to play high-quality video content on all mobile, tablet and browser variants (Figure 8.6). While the creative team can provide a pleasant shopping experience on different channels, they are simultaneously in contact with the sales and marketing team without any connection code.

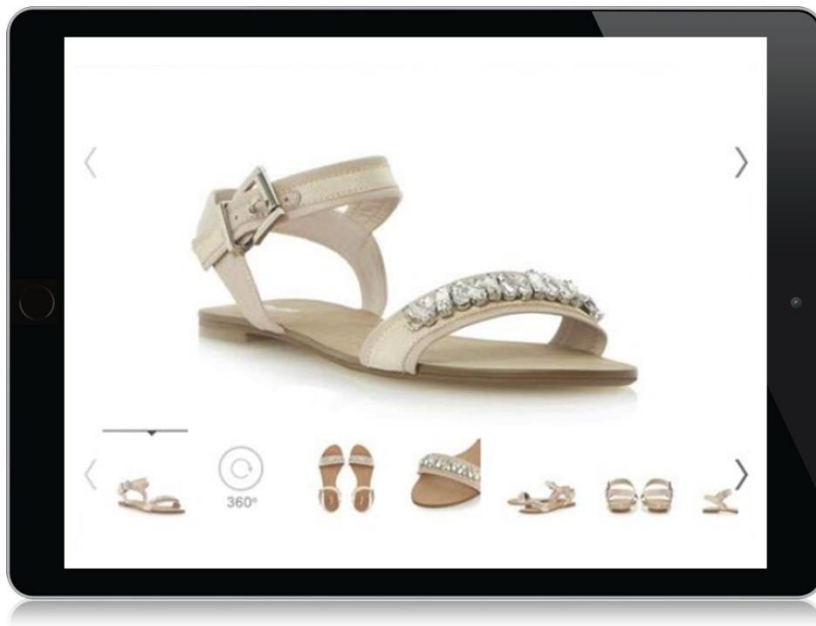


Figure 8.6 High Quality Images for Attracting Customers

It is critical that the retailer minimizes the responding time by creating an experience that is persuasive and removes barriers to purchase (Melis et al. 2015). This requires richly compelling product media and intensive level of team integration that enables site visitors to visualize the product through high- resolution imagery, interactive 360 spins and product videos full of rich features. Ampliance’s workflow automation enables product media to be joined into a rich media set, creating a rich combination of interactive content that is optimized for every mobile, tablet, and desktop screen.

Key features and benefits of the technology implementation process:

- Expands on capabilities to enable different teams to have control over all responsive image variants, without code.

- Allows video to be added to any page and ensures the quality of video delivery across devices and channels.
- Reduces page load time for all responsive content, improving the customer experience, response rate from the customer service team, and driving conversions.
- Enhances the product page experience through Ampliance viewers, optimizing conversions across all devices.
- Increases productivity by automating the publication of product content.
- Ensures the fastest possible delivery across all devices and channels with Ampliance's load-balanced system.
- Allows for the creation of shoppable content enriched with live product data to drive customers from inspiration to purchase e-catalogues across channels.
- Simple and intuitive to use with the Salesforce Commerce Cloud System for different teams.

8.5 CASE 4: INTERNET OF THINGS

The following case study will explore an example of the type of technologies that primarily improve operational effectiveness and customer engagement (see Figure 8.1). It illustrates the importance of cloud services used to improve the operational effectiveness. Further, the technology enables the retailer to engage customers at different points of interactions (Oracle Internet Retailing 2017). This case study highlights the IBM cloud commerce

strategy as the future of retail. The world of e-commerce and the cloud is changing as retailers look to adopt virtual technology solutions to enable speed to market and use their resources effectively. The IBM cloud solution evolves retailer's business model to focus on digital learning solutions for customers. Further, the retailer needs to move quickly to build and scale a differentiated solution economically (Marinova et al. 2017). Therefore, the IBM cloud commerce solution eliminated that roadblock to managing resources and improving customer engagement. The technology now offers personalized solutions to the retailers, and it can respond to market shifts and to change customer attitude quickly.

Through offering cloud services, firms can manage their assets, react more quickly to the customer demand, and provide more personalized customer experiences. Cloud customers need skills that can only be enabled by using a more diverse set of services than before, which is delivered in an entirely new way. Most retailers today have traditional IT infrastructure, which is not designed for the cloud but is essential for day-to-day operations. IBM cloud service strategy helps a retailer continue to support its primary activities and still take advantage of all the benefits that cloud service can provide. The solution offers a new integration of resources while engaging customers and matching their needs. Alongside using the firm's assets to manage the resources properly, the speed of the introduction of service innovation development to market is one of the most significant advantages of the IBM solution for the transition to a cloud environment.

With enterprise software that is now hosted in the cloud, there is no longer a need for expensive, managed infrastructure or teams of people whose primary task it is to deploy software updates. Instead in the software as a service model deployment of a commerce

solution can be faster and more aggressive since it requires less time and resources to be spent for planning. Software updates meanwhile take place automatically, on time, and most importantly without work needed by the retailer itself.

The cloud model is also highly suited to retailers on a growth journey, particularly into international markets where an investment in infrastructure may not be viable or desirable. It further enables the retailer to create value through a more responsive service innovation development. Cloud commerce allows retailers to move forward. To concentrate not on the management of their IT systems but to focus instead on what they do best – looking at what they sell, how they sell and, of course, getting on with selling itself. The IBM cloud commerce enables the usual business of retail without the distractions that retailers have had in the past. The implementation of the IBM cloud commerce technology allows the retailer to assess its benefits against the cost of ownership while effectively maintaining their existing infrastructure. For instance, discount retailer The Works had, until 2012, mostly ignored the opportunities of ecommerce. However, in late 2012 with the implementation of IBM's cloud Commerce solution that all changed. The company introduced an initial online catalogue of 70,000 products and earlier in the year became the first discount retailer to launch a click and collect service.

The advantages of the subscription model of the cloud also helped to secure the investment in the project in the boardroom (Pauwels and Weiss 2008). The cloud commerce model has even allowed the retailer to quickly integrate, innovate services, and ideas to engage customers. Most strategically the investment in the cloud commerce platform has meant the ability for The Works to introduce its click and collect

functionality, driving sales across both the Internet and its stores. Importantly the implementation of a cloud commerce solution before its adoption has enabled The Works to race ahead of its peers. Like many other case studies in retail, the choice of the partner during the implementation stage was key.

Features and benefits of the technology implementation process:

- Understanding the cloud commerce's ability to offer speed, agility, and scalability
- The move from a CAPEX to an OPEX environment also proves to be attractive during the implementation stage
- The change from supplier to partner means that retailers must pick the right partner for their business
- Retailers wanted to enable the same benefits to their business as those enjoyed by their tier one rivals
- Cloud commerce allows retailers to leapfrog their competition using their existing resources
- Cloud commerce allows the retailer to identify and contextualize the customer journey

8.6 CASE 5: DATA ANALYTICS AND E-COMMERCE

The following case study will explore an example of the type of technologies that primarily improve operational effectiveness and assortment preference (see Figure 8.1). It illustrates that the degree of product customization can result in operational effectiveness

or customer lock-in (Figure 8.1). The technology enables the retailer to match customer needs and wants. Product customization is described by the way in which customization is achieved. Customization may be due, for example, to a different configuration of common parts; to some truly customized parts; or, to an entirely new design for service innovation development (Hsieh and Hsieh 2015; Wu 2014). The degree of which a product can be customized defines whether the retailer is trying to achieve operational effectiveness or customer lock-in (Kamakura et al. 1997).

On the one hand, a retailer can offer customized products because of common market practices and manage its core assets for continuous service innovation (Patel 2014). On the other side, the retailer can go beyond the common market practices to achieve a higher level of customer satisfaction (Hammerschmidt et al. 2016). Therefore, the degree of customization, as for whether it is a common practice in the market, which is performed by many of the retailers, or offering unique and exclusive product content to match the customer expectations, highlights the retailer's desire to achieve operational effectiveness or customer lock-in. This case study highlights the Ampliance Dynamic Service for product customization.

Consumers have high expectations when it comes to ecommerce. Market leaders have set their expectations, and they have little sympathy that smaller retailers may not have the budgets or ability to match such a service without paying a hefty price for it (Lemon and Verhoef 2016). But retailers cannot ignore what consumers want – especially since if they get it wrong, that customer is one click away from a rival retailer (Herhausen et al. 2015). This powerful extension to the Ampliance Dynamic Media service generates on-demand images of product colour variants, monograms and other visual customizations to power

rich product media viewers and sophisticated product configurators. The result is lower content production costs and double-digit increases in conversion.

The Amplience Dynamic Media service renders colorizations, monograms and image substitutions (for fabric and texture visualizations), from a single master SVG (Scalable Vector Graphic), which can be enriched, tested and published using the Product Customization App. Amplience Product Customization is a complete solution for single and multi-brand retailers seeking to reduce digital production costs and to improve the quality of the online shopping experience. This further provides a full set of media for all product and feature variants, as well as to deliver visualizations for product personalization and customization options (Rose et al. 2012).

The solution delivers on three key online retail use-cases:

1. Dynamic product colorization

User research shows that incomplete, inconsistent or erroneous product media is a significant barrier to online conversion. However, for retailers with extensive product ranges that feature many colour and option variants, the cost of bringing samples into the studio to shoot every possible modification is prohibitive.

The Product Customization solution enables reference product images to be turned into SVG templates, which can then be dynamically rendered on-demand in any colour and option variant, through URL parameterization (Figure 8.7). This ensures that product page media viewers can visualize many more colour and option variants than ever before, allowing shoppers to see every possible colour and option combination.

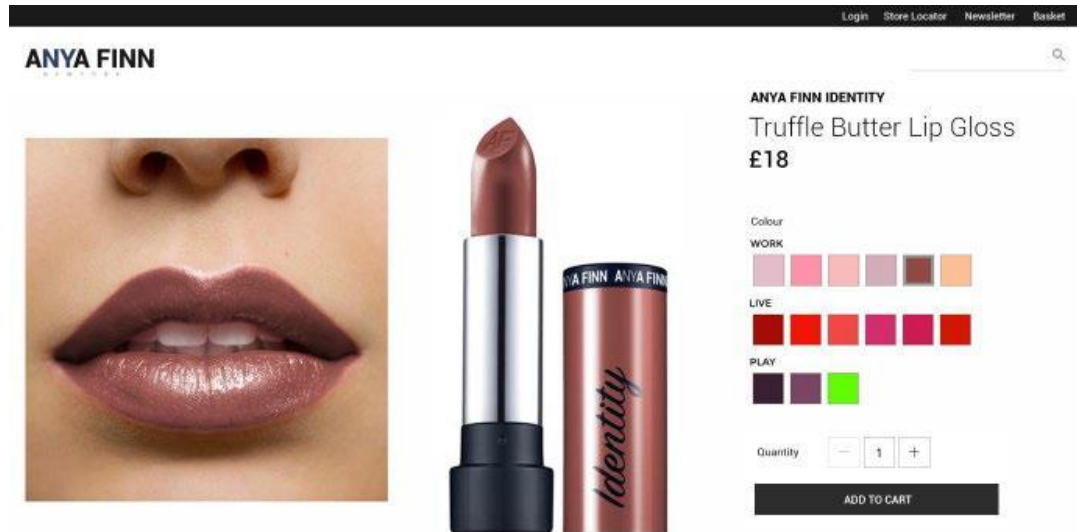


Figure 8.7 Product Customization on the Web

2. Product monogramming and personalization

Product personalization, in the form of monogramming or the application of custom text fields, is increasingly used by brands to seek differentiation from discount retailers and the ever-ubiquitous Amazon. This strategy is most effective when the end-result can be visualized in a photo-realistic way – delivering higher engagement, conversion, and customer satisfaction (Figure 8.8).

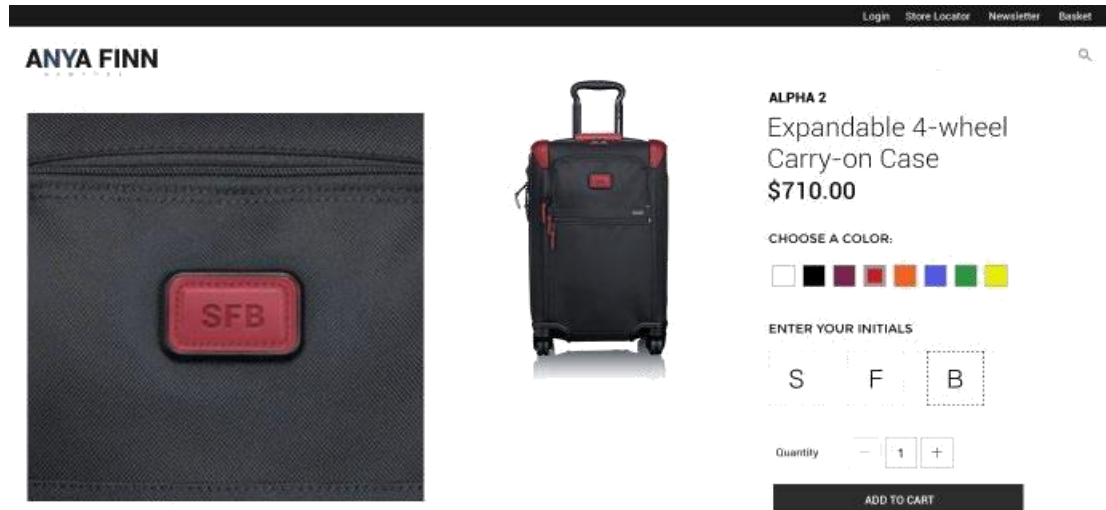


Figure 8.8 Product Personalization

3. Custom configurators

In lifestyle product categories like furniture, homewares and apparel, the ability for customers to interact with and configure visualizations that contain multiple products and product options like colour, fabric, patterns and feature is a critical step in the purchase journey (Figure 8.9). Sophisticated configurators can drive engagement, conversion and average-order-value while providing unique functionality for product personalization.

The Product Customization solution supports the complete design and builds workflow from initial SVG template development, through to deployment into the Ampliance Dynamic Media service. Once published, the SVG templates take full advantage of the dynamic image transcoding and caching services built into the Ampliance Content-as-a-Service platform, to deliver lightning fast image rendering at 99.99% availability.

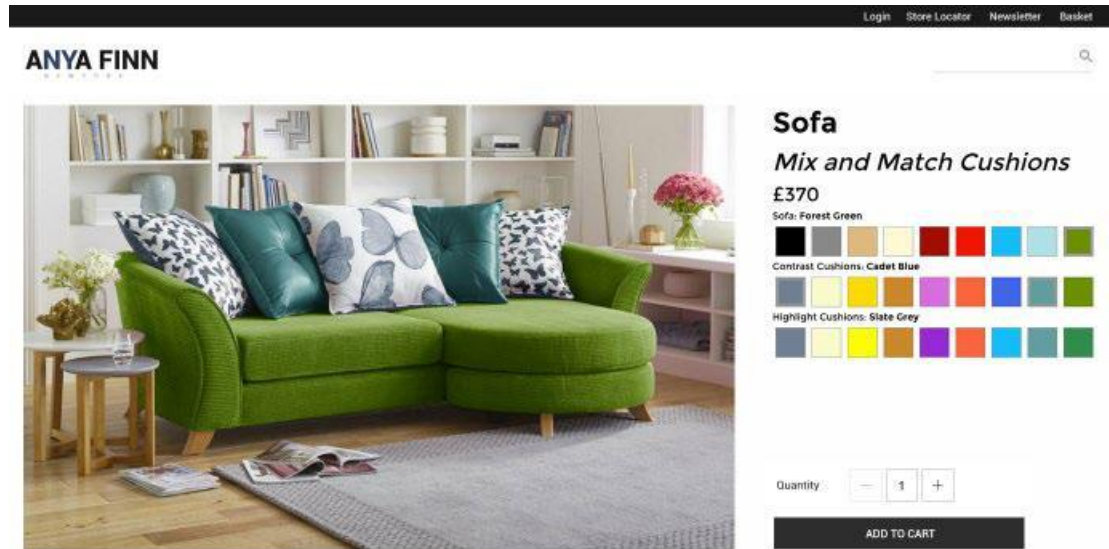


Figure 8.9 Detailed Degree of Product Customization

Key Features and Benefits of the implementation stage:

- Deliver a complete set of product images for all colour and feature variants to drive product-page conversion uplift and reduce production costs.
- Create unique product differentiation with personalized products.
- Flexible and effective management of firms' limited assets, which Amazon and discount retailers cannot match.
- Simplify colourization and monogramming template development to reduce Total Cost of Ownership (TCO).
- Create rich custom configurators that visualize complex product categories to drive engagement, conversion and average-order-values.

8.7 CASE 6: WAREHOUSING AND FULFILMENT

The following case study highlights the importance of technologies, which primarily improve operational effectiveness and customer perception about different channels (see Figure 8.1). This case study has examined the role fulfilment plays in delighting the multichannel shopper and the challenges that retailers face in meeting such demands. Multichannel shoppers now demand a state of the art experience and as such retailers are looking at all areas of their business to deliver upon that from carrier partners to legacy systems (Cao and Zhao 2004). When it comes to returns, there is much to be done with visibility of returns, awareness of a return when it arrives at the warehouse, and awareness of the return when it comes at a return-processing centre (Bhatnagar and Ratchford 2004).

Vanderlande is a reliable partner for the delivery of value-added logistic process automation. As retailers push for increasingly smart solutions to fulfil orders, Vanderlande offers a market leading, one-stop shop service for e-commerce and omni-channel warehouse automation solutions. This includes service innovation development in the forms of software and life-cycle services. Additionally, Vanderlande integrates and supplies fully automated systems for parcel-sorting centres, often taking care of the last mile solution. This case study provides a summary of a partnership between the technology supplier, Vanderlande and the footwear retailer, Schuh.

Despite being a smaller retailer, footwear specialist Schuh is surpassing customer expectations by embracing solutions that allow for greater flexibility and better service for its customers. The retailer now operates both its original delivery hub in central Scotland

as well as a West Bromwich distribution centre, which opened in 2015 and uses a material handling solution from Vanderlande. The new distribution centre has allowed further improvements to a delivery and returns proposition which already surpassed customer expectations, meaning for example that customers can now order up to 10 pm (from 5 pm previously).

But the retailer appreciates its customers want choice and convenience – offering them everything from standard delivery (free), to next day, choose your day and Sunday delivery to services such as click and collect in as little as 20 minutes and a range of collection point services. Cost varies, currently standing at £1 for next day and named day deliveries at the point of writing but free next day deliveries will be introduced next year. The retailer is also looking at additional service innovation development – such as a try on at your desk ability, where customers can send goods back immediately if they change their mind. Customer expectations have changed such that a retailer that expects a customer to be happy with a vague estimation of delivery, with no further update as to progress, is asking for trouble (Teller et al. 2016). Even those companies that offer free delivery risk upsetting customers if – although delivery is free – there is no actual ability to track it.

Timed delivery slots have long proved popular for bulky goods such as large electrical items or furniture, but fashion retailers are getting in on the game too. In August New Look revealed it was one of the first retailers to allow its customers to pick their preferred one-hour timeslot for next day delivery in partnership with DPD's Precise delivery service and technical support of Vanderlande, rather than being informed of the timeslot by the delivery company. Click and collect also remains hugely popular for convenience given it

assures product availability but leaves the customer in charge of pick-up and what was once an add-on service for retailers is now an integral part of their model. After going through a trial and error process with Vanderlande, the Schuh retailer can use the click and collect model to support their same day and next day delivery promises.

Vanderlande has also been able to help Schuh with the new “Doddle model”. Here, the customer can collect, send goods, and request a full refund from retailer’s store. Naturally, this makes speeding returns a huge focus for the retailers. Furthermore, faster return credits will encourage more sales and results in customer’s choice of multichannel (Mahar et al. 2014). For the Vanderlande, ensuring faster return turnaround was the element of their operation chain that 11% of the retailers were most focused on. Retailers realize the experience needs to be good for the customer to have their preferred choice of channel (Neslin et al. 2006). This model proved to be effective and time efficient during the implementation process, involving Schuh and Vanderlande. During the implementation process, the supplier offered a subscription-based service for in-store collection and refund process. Eventually, this service was rejected through in the implementation process. Instead, the online footwear retailer provided one-time charges for in-store visits including collection, sending goods or refunds.

The warehousing and fulfilment technologies can be applied at lower levels as well (Bhatnagar and Ratchford 2004). There are still smart ways of person to goods systems, but also options like mini batch or batch pick sort solutions. That is a lower level of automation, but it is still much more effective than the standard order picking process. It is an option that fashion retailer Schuh is already implementing. The company uses a

Vanderlande cross belt sorter with pick belts that allow the request to be sent to the right packing chute – whether for stores or individual web orders.

Key features and benefits of the implementation stage:

- Different subscription-based services were tested and analyzed during the implementation process
- A new or update warehousing management system is increasingly required and being implemented
- Retailers also cited organized warehouse space through the enhanced layout. Warehouse operations are becoming increasingly costly due to poor space management. In many cases, this cost had to be covered with one-time charges of services such as delivery, collection, or in-store returns.
- Warehousing and fulfilment technology leads to a reduction of human error and encourages customers to become multichannel shoppers.

8.8 CASE 7: CUSTOMER EXPERIENCE MANAGEMENT

The following case study highlights the importance of technologies, which primarily result in customer lock-in while they improve customer engagement (see Figure 8.1). For a retailer, the development of mobile apps happens as an internal development process or by a partnership with an existing supplier. In the case of the internal process, the IT department goes through different stages of the implementation process. In the other case, the technology supplier (small or medium-sized) gets involved in the implementation process. Perhaps the most impactful type of technology for enabling service innovation

development in retail, has been the mobile revolution (Piotrowicz and Cuthbertson 2014). For many retailers a significant proportion of their e-commerce traffic now arises from mobile (Grewal et al. 2016).

Sopra Steria is a technology supplier with a diverse range of technologies and services performing in the UK. Digital Inclusion is part of Sopra Steria's innovation strategy, which aims to support economic growth, strong communities, and a healthy planet. As an IT services company working on sustainability, the company's focus is on digital inclusion designed to address the areas, which have the most significant impact on capabilities and resources. The areas include economic independence, economic opportunity, and social connectedness. To contribute to these areas, Sopra Steria provides leadership, supporting skills and technological know-how, and investment in digital inclusion. This case study provides a summary of a partnership between the technology supplier, Sopra and the fashion retailer ASOS.

With its millennial focus, fashion retailer ASOS was quick to recognize the power of mobile apps as a place to drive brand engagement and inspire purchases. ASOS has reaped the benefits of an efficient and smooth mobile app, developed to cater to changing customer demands and to boost engagement and loyalty. ASOS recently reported a 26 percent rise in retail sales thanks to its mobile customers. ASOS launched its new app, which was built specifically to incorporate cutting edge design, seamless navigation and new features such as spotlight search and 3D touch for iPhone users. In this case study, the supplier (Sopra Steria) provides multichannel consultancy on design, development and testing of mobile applications for IOS (Apple) and Android devices used by the retailer's customers. The key points of this partnership were 1) design and develop applications specifically for Apple

and Android mobile devices, 2) Adherence to project governance processes and procedures, which ensures smooth customer engagement through the apps, and 3) collaborative working between the supplier and the fashion retailer.

While the retailer faced increasing customer demands for value-added services, they sought to quickly expand the availability of some operational and customer information on additional digital channels (Verhoef et al. 2015). This strategy aimed to ensure that the service innovation development was accessible by more customers, helping to improve the overall experience when customers interacted with the company (Verhoef et al. 2009). A project to implement and eventually rollout two initial iPhone and Android Apps was initiated, designed to allow customers to access information on products and services close to their location. Mobility solutions offer an opportunity for differentiation. For example, customers already adept at interacting with retailers, banks and other service providers via their mobile devices might readily take up the opportunity to download a mobile application (App) from their utility provider. This was a key driver behind a leading retailer's strategy to quickly expand the availability of some operational and customer information on additional digital channels.

The supplier's practice was focused on helping the retailer ensure all the channels communicate with the same database of products, prices and promotions to deliver a seamless customer experience. Working with the retailer's in-house development team, the technology supplier consultants helped to provide various applications for a 'mobile' audience. The key responsibilities of the technology supplier during the implementation process were as below:

- Target areas where mass market mobility will create the most value
- Key members of the retailer's team should be involved to provide a clear understanding of the mass market mobility constraints and behaviours
- Segment multiple teams into capability, control and development categories
- Develop a package of management policy for each team in charge of different operations
- Deploy management policies that control behaviour, educate users and bring transparency to compliance
- Deploy technologies and operational policies that deliver the mass-market need for achieving higher engagement
- Support the app throughout its life cycle during the implementation stage and after the rollout
- Review and revise the approaches every one to two months

Sopra Steria has worked with ASOS since 2014, providing application development, testing and consultancy services across some technology platforms. The latest mobile project saw the firm providing a multi-skilled team to act as a complement to its client's in-house development team, providing flexible resource and expert consultancy and testing services. The joint Sopra Steria and the in - house team worked through some different communications channels to keep the project on track. These included regular conference calls and Web-Ex sessions to minimize the number of reviews required onsite. Each

member of our team was paired with a resource within the utility company's team working at the same level. In this regard, the implementation process took almost nine months. Sopra Steria delivered services in three key areas:

- a) Development consultancy: providing remote consultancy and advice to inform its client's mobile application delivery. This demanded sound knowledge and experience of mobile application technology within both the IOS (Apple) and Android environments, including industry best practice, appropriate standards and best-in-class tools. The Steria team helped to develop the requirements and delivery plans to fulfil an initial launch of two applications within the pre-defined project timescales
- b) Testing: Steria's dedicated in-house Mobile Testing Lab tested physical devices and simulators based on an agreed set of Apple and Android devices. Working closely with the client team, the supplier confirmed the operating system (OS) levels and devices to be tested, performing high-level non-functional testing on the Apple OS Level 5.0 and several Android devices from OS level 4 upwards.
- c) Release management: during the implementation process liaised with the client team to help develop an understanding of the process/quality standards of the relevant governing bodies, such as Apple iStore. This helped to secure approval to release the developed applications to the Apple and Android environments.

Key Features and Benefits of the implementation stage:

- To create a collaborative project in line with the retailer's governance processes and procedures

- To ensure the two new Apps were delivered to the live environment on schedule and the agreed quality
- To offer customers the ability to access information on products and services close to their location
- To provide a mutual partnership with the retailer's team for a smooth overall experience when customers interact with the company through multiple digital channels
- Seamless customer experience of the brand across all channels including the website and the mobile apps

8.9 CASE 8: SHOPPER ANALYSIS AND LOYALTY PROGRAMS

The following case study highlights the importance of technologies, which result in customer lock-in through providing a clear understanding customer choice and need (see Figure 8.1). As explained before, the degree of customization and matching customer needs defines the retailer's principal objective. It shows whether the retailer is trying to achieve operational effectiveness by proper use of resources or customer lock-in by providing a deeper level of customization. The below case study highlights the technology of 3D printing for footwear presented by FitStation, powered by Hewlett Packard (HP).

While 3D printing technology has been in the market for quite a while, its conversion to footwear is considered as a breakthrough in the retail sector. Although the core function of 3D printing is about a reduction in components, the footwear technology is about creating products based upon data and design. The data is then used to customize the

product at a very personal level based on individual needs. HP's citation is a hardware and software platform that first 3D scans a person's foot, measures foot pressure and performs gait analysis to create a "digital profile" of each foot. This makes it possible to then 3D print insoles and creates custom footwear. The footwear can then be 3D printed on HP's Multi Jet Fusion printer. HP says that with FitStation it is reinventing the in-store retail experience for shoppers by marrying the convenience of local printing with a new level of personalization. The scanner can also recommend existing off-the-shelf in-soles where relevant.

The scanning process starts with the customer walking across a pressure surface. This allows the supplier to have an in-depth and clear understanding of the customer's walking behaviour. Next, a simple 3D scan of the customer's feet is performed to know the length, width, and volumetric information for future recommendations. With 3D printing, the supplier can use this data and create custom products for them at a low price compared to the current market average. The basic of this technology is to provide hundreds of thousands of cells as the core components of materials used for manufacturing. Each different cell can be customized based on individual needs and the degree of athletics. While the technology is still at the very early stages of the pilot test, a primary requirement from the pick-up stage is to provide different levels of cushioning based on customizing different cells. During the tender and application stage, the supplier decided to involve more than one team to simultaneously work on the project including lab teams, software development team, and a service provider team for 24/7 supports of the in-store 3D printers. The involvement of more teams, will provide a more in-depth analysis of customer preferences and achieve a maximized level of lock-in.

Key features and benefits of the implementation process:

- To offer a new feature known as personalized off the shelf recommendation plus 3D information for more customized products
- To locate HP Multi Jet Fusion 3D Printers in-store for scan and collect orders
- To involve multiple teams from HP such as Immersive Computing Ltd to external software developers. This provides support for in-store services and faster-individualized mass production
- To include different teams to lower the design process from one week to three days to achieve the customer satisfaction

8.10 CASE 9: PORTABLE HARDWARE

The following case study highlights the importance of technologies, which result in customer lock-in and improving customer perception about different channels (see Figure 8.1). The technology is primarily the result of technological know-how. The knowledge of advancing technology results to intellectual property, which is either owned by the retailer or the supplier. Different technologies are presented in the UK retail sector annually, either through workshops, exhibitions, seminars etc. However, the two technologies illustrated for this type either have passed the implementation stage or are currently being implemented. In this sense, Waitrose's lab accelerator known as "Hot Ideas Incubator Programme" will trial retail innovations and the first product to market will be a home scanning device called Hiku (Figure 8.10).

The grocer has signed an exclusive partnership with the Silicon Valley-based entrepreneurs behind the device, Hiku Labs, to launch the device in the UK. Hiku Labs is a Silicon Valley startup that is disrupting the traditional retail grocery shopping experience with the development of a consumer-facing IoT-enabled 'smart' kitchen device to help busy families. With key roles in developing early mobile technology, the founders of Hiku Labs wanted to create dedicated technology that would enhance and modernize the shopping habits of millions of people. Hiku offers insights into consumer preferences, and that is something highly valuable to retailers and brands, as it provides a comprehensive and precise view of consumption at an individual level. Hiku Labs' powerful, connected platform gives retailers a deeper data-driven understanding of consumer behaviours outside the aisles of the grocery store to assist in predictive business decision-making in a way that was previously unattainable.

Hiku, which was introduced by Hiku Labs for the first time, is an innovative home scanning solution that will enable Waitrose customers to populate their electronic Waitrose.com shopping basket, by either scanning a product barcode or speaking a product name into the Hiku device, which has a voice to text recognition capability (Figure 8.11). Hiku gives customers a simple way of compiling or adding to their Waitrose.com list and is the first shopping solution in the UK that combines important technology in the kitchen with the convenience of online shopping. Hiku is a small, palm-sized device that can be conveniently attached to a fridge or kept in and around the home for all the family to use. Items can be added as they are taken out of the fridge, or customers can speak ingredients from recipes as you plan your dinner. If customers prefer to add items on the go when out of the home, an app on their phone also allows them to update their order.



Figure 8.10 Hiku by Hiku Labs

Hiku will be piloted among Waitrose employees (known as Partners) and customer focus groups first before an extensive in-home trial. “Waitrose Hot Ideas Incubator” puts ideas front and centre in Waitrose's search for convenient technological solutions for our customers. The programme also aims to involve customers from as early on in product development as possible, testing products with focus groups and trials so that our customers can provide feedback and refine the idea throughout the process. This further results in achieving lock-in and encourages customers to use multiple channels of one retailer for their shopping purposes (Hammerschmidt et al. 2016). In this sense key informant 17 said, who is an IT director mentioned:

“...Customers want a simple and easy to work voice recognition device at home rather than solely relying on the app because it scans barcodes four times faster than a smartphone. In fact, this idea turned up a few years back during the implementation process for our firm’s mobile shopping app...”



Figure 8.11 Hiku as a Handheld Scanner

During the implementation process, a key objective was to develop a new connected product that makes shopping easy for busy families and offers functional and straightforward user experience. To improve user experience and achieve lock-in, the technology supplier was dedicated to offering a single “use-case” in the same way that some devices such as Amazon Kindle e-reader perform. Further, within the same process, the idea that Hiku should be as easy to use as a pen and paper but has all the benefits of mobile became evident and more important than expected. By digitizing consumer intent previously restricted to analogue pen and paper or a low-fidelity mobile shopping app, Hiku Labs technology has the potential to disrupt the conventions of the retail industry. Hiku Labs and Waitrose had a partnership with an external technology supplier, Electric Imp to provide a connectivity solution that was secure, scalable and flexible enough to adapt to sophisticated cloud-based services. This partnership with a third supplier during the implementation process was driven many factors including:

- Time to market as the Electric Imp's connectivity solution was fast and easy to integrate into the Hiku product and future generations of the device.
- Focus on innovation as Electric Imp allowed Hiku Labs to focus on its key differentiator, which was wrapping an excellent consumer experience around an integrated hardware/software service product.
- Reduced risk as Electric Imp's out-of-the-box technology reduced Hiku Labs' worry about developing hardware or firmware fundamentals like Wi-Fi connectivity or over-the-air updates.
- Improved manufacturing With Electric Imp since Hiku Labs could remotely monitor manufacturing production, and the platform reduced the amount of manufacturing software development required.
- Easy out-of-box setup With Electric Imp's patented technology solution as consumers of all ages could easily and quickly connect a device to in-home WiFi.

It is not yet clear if UK customers will be charged for the device. The technology is still at the implementation stage and the retailer has not worked out the commercial details of the scheme yet.

Key features and benefits of the implementation stage:

- The ability to add the products on the shopping list to the shopping basket within the app

- Hiku Labs and Waitrose secured powerful partnership and integration with leading software developers, which will result in faster product commercialization in the future.
- Integrating the proprietary connectivity platform powered by Electric Imp into the product helped them get there faster, more reliable, and with significantly less development cost.
- Electric Imp's sophisticated and scalable solution will be easily synced with Hiku Labs' and Waitrose's database. This will provide a faster and responsive after sale support.
- The partnership among Hiku Labs, Waitrose, and Electric Imp will result in predictive inventory management. This connectivity enables data aggregation that helps the retailer manage inventory and supports data-driven decision making.
- The partnership will enhance consumer relationships. The real-time tracking of individual consumer shopping behaviours builds better brand interactions and advances personalized or targeted marketing opportunities, which further results in the lock-in effect.
- The partnership will develop automated shopping services. Through being able to deploy new code at any time, connectivity powered by Electric Imp enables new services and purchase options. These new revenue streams positively impact the retailer's profitability.

8.11 CONCLUSION

The findings of the case studies contribute to the stream of literature on the importance of technology for service innovation in a retail context (Brynjolfsson et al. 2013; Evanschitzky et al. 2015). Previous studies using case studies in retail have highlighted the crucial role of technology from the viewpoint of self-service technologies. These have been primarily developed after the emergence of self-service checkout systems. The findings presented in this chapter provide a simple understanding of a diverse range of technologies using polar and theoretical sampling. They identify key value drivers of technologies in retail and illustrate their impact on service innovation development during the implementation process of technologies (Sorescu et al. 2011; Venkatesh et al. 2012).

The classification of technology spectrum in retail (Figure 8.1) elaborated on nine types of technologies. The cases are the result of primary data collection with key informants and case study research. Different cases studies are allocated to different cells in the classification of technologies. For each cell, the implementation process including the roles of the technology supplier and the retailer were explained respectively. Furthermore, the key features and benefits of the implementation process for each type were explained. The findings highlight different challenges and opportunities that emerge during the implementation process of technologies. Therefore, in search of increased technology value-creation, constant improvement happens in the practices of service innovation. This further justifies the definition of service innovation development presented in chapter 4. That is, continuous focus on service innovation through the implementation of different technologies, results in constant improvement of the service

and, in some cases, in some cases the emergence of a new service. Also, the investigation of the technology implementation process for different cases support the literature review on the vital role of the retailer-supplier relationship for value appropriation (Richey et al. 2008; Sorescu et al. 2011); and the retailer-customer relationship for value co-creation (Dong et al. 2008; Karpen et al. 2015). Indeed, with all the case studies there was evidence of the fundamental role of the implementation process and how the retailer overlooked it.

The findings provide evidence of the complex and multidimensional aspect of the technology implementation model and its effects for technology value-creation and service innovation development. For instance, the example of mobile payment systems illustrated the case where detailed attention was paid to added value during different stages of the technology implementation process. This led to the emergence of new technology and a new type of service exclusive to the retailer. As such, was considered as the starting point for achieving technological know-how through the development of payment software by the retailer as well.

The finding also underlined the growing interest of the retailers to obtain technological know-how (i.e., skills and body of knowledge in the form of tangibles or intangibles to achieve the desired innovation results). Embedded in the frameworks of this research, strong intellectual property rights facilitate (licensing) transactions in the market for know-how (Somaya et al. 2011); and that absent intellectual property rights, the market for know-how will be less efficient (Teece 2006). This was particularly the case for the type of portable hardware technologies (see Figure 8.1). Delivering service innovation development during the technology implementation process and in collaboration with

partners that have diverse knowledge is challenging. This challenge is of particular interest within the retail sector as the commonly used means for knowledge protection is often unavailable or unsuitable in at during the implementation stage. That is, technologies and practices of service innovation can be duplicated by the competitors easily. Despite the emerging interest, the protection of knowledge and intellectual property within the retail sector will continue to face bottlenecks.

CHAPTER 9 ANALYSIS AND DEVELOPMENT OF 9 RETAIL BUSINESS

MODELS

9.1 INTRODUCTION

This chapter presents the second phase of the analysis of the data collection process. It provides the answer to the second research question, which is, how do retailers create value for their services during the implementation process of technologies in the UK retail sector? In doing so, the analysis provides a typology of business model innovation in retail (Figure 9.1). The typology includes nine unique types of business models. Each business model is introduced as an ideal type. The nine ideal types highlight the importance of the implementation of technologies for creating value and advancing services.

The typology of business models in retail first: provides nine ideal types about the application of technologies for advancing services (Figure 9.1). It also considers the impact of multidimensional constructs of value appropriation and value co-creation, which are the building blocks used to describe the ideal types. The ideal types and building blocks are vital elements in theory building and providing practical and theoretical contributions (MacInnis 2011; Snow and Ketchen 2014). Doty and Glick (1994) defines ideal types as compound constructs, which are the result of configurations between multi-dimensional building blocks. Each ideal type explains dependent variables and the importance of the implementation of the its associated group of technologies (Figure 9.1). This justifies the internal consistency among the building blocks resulting different ideal types. Furthermore, the allocation of the technologies and the implicit predictions of the

importance of technology value-creation and service innovation development, which accompany each ideal type, are deductible and subject to disconfirmation (Mills and Margulies 1980). Finally, the fact that different technologies may not be inclusive to a particular type of retail business model; and can be allocated to different types as a result of testing, highlights the “falsifiability” criteria for reflecting typologies as theories (Bacharach 1989; Doty and Glick 1994). As such, the typology of retail business models is a complex theory that is subject to future empirical testing (Fiss 2011).

While the research argues how different types of technologies result in business model change, it does not explicitly state why the set of different types should predict such a change across different retailers (see Figure 9.1) . What the analysis and development of the typology of business model innovation imply here is a theoretical and practical assertion regarding the fit of technologies into different cells. This makes the allocation of them inclusive as they could fit into multiple cells at the same time. In fact, because of this unique and classic feature of a typology, it meets the criteria of building a theory (Snow and Ketchen 2014). Meanwhile, it is worth mentioning that the typology in this research – the same as well-developed typologies, which offer a theoretical debate – is not a grand theory about different types of value, but rather about designing the subsets and variables of value creation potentials for technologies within each value premise. The grand theory explicates strategies for neither value appropriation nor value co-creation, instead describes the importance of each associated component within these value premises (see Figure 9.1).

Operational Efficiency	<u><i>Externally Aware Business Model</i></u>	<u><i>Integrative Uncertainty Business Model</i></u>	<u><i>Platform Business Model</i></u>
Operational Effectiveness	<u><i>Performance Segmented Business Model</i></u>	<u><i>Price Segmented Business Model</i></u>	<u><i>Commodity Follower Business Model</i></u>
Customer Lock-in	<u><i>Asset Adaptive Business Model</i></u>	<u><i>Differentiated One-Hit Business Model</i></u>	<u><i>Actor Reciprocated Business Model</i></u>
	Customer Engagement	Customer Preference	Channel Evaluation

Figure 9.1 Typology of Retail Business Models in the UK retail Sector

9.2 IDEAL TYPE 1: EXTERNALLY AWARE BUSINESS MODEL

Definition: Involves the early participation of internal and external technological development for different market segments (Figure 9.1).

Description: The externally aware type represents an incremental innovation because of maintaining a balance between core and complementary assets. While there is an excellent degree of resource integration here, the firm tries to find a balance between the market-oriented demand and knowledge-driven technology. This further results in the application of technologies that facilitate the most common practices for service innovation development in the market. In this type, a primary purpose of the implementation process is to benefit from commonly adopted technologies. The

technologies are the result of standard practices of service innovation development. Any retailer competing for the majority of customers, would perform these practices. Consequently, a firm considers a technology mostly because of the competitor's adoption. The firm primarily benefits from the technology as a user, since the intellectual property belongs to the technology provider. Although efficient processes reduce the interaction time with the consumers, retailers use technologies to improve the quality of the engagement time – however limited – with the consumers (Dabholkar and Bagozzi 2002b; Grewal et al. 2017). Therefore, the key focus of the retailer is to improve the speed of processes while they try to maintain a certain level of interactions with the customer.

In this ideal type, the retail service network of activities has started to open itself to external ideas and technologies in the development and execution of service innovation development. While the firm engages in the implementation of technologies that result in faster business activities, the retail business model provides a more focused form of market segmentation. The retailer will categorize the customers into different groups based on specific behavioural patterns. Frequently, the technology supplier and the retailer capture different forms of customer engagement as they display when making purchasing decisions. This enables the retailer and the technology provider to adapt their core and complementary assets to different target markets. Providing a clear understanding of customer behaviour may extend the length of the implementation process. However, after the rollout stage, the retailer can maintain a balance between efficient activities and engaging customers as a typical practice of service innovation development. With faster and more efficient activities as a key objective, the retailer can

implement and adopt Internet-enabled service innovations, which are services benefiting customers primarily through the Internet.

Due to internal and/or external development of technologies, the service innovation development becomes multidimensional including: interactive, supportive, product, and process service innovation. Interactive service innovations primarily involve external partners, whereas supportive service innovations contain internal development. Furthermore, it involves service innovation through introduction of new hardware technologies. Or, process service innovation through introduction software technologies like processes and methods. Here, the business model tries to achieve efficiency through engaging customers and offering technologies, which are suitable for the majority of the customers. Finally, as it is evident from the case study provided for this type in chapter 8 (Payment & Point of Sale, see Figure 8.1), this conceptualization focuses on value co-creation and customer experience. It highlights that the retailer and the supplier engage in appropriating value, they also participate in the co-creation activities within the implementation process. Therefore, the value is co-created by multiple actors in an actor-generated service business model.

9.3 IDEAL TYPE 2: INTEGRATIVE UNCERTAINTY BUSINESS MODEL

Definition: A formalized service network of activities that involves a shared sense of participation primarily from external technology providers and customers (Figure 9.1).

Description: A minor change of service innovation development through the application of technology happens for this type. Since there is an element of understanding customer choices and preference, the primary focus of benefiting from the technology is on

appealing services related to the products. The firm's business model now plays a critical integrative role within the company. This retail business model provides a robust and shared sense that connects the many different functions. Here, the business model acts as a platform that connects the supplier and the customer. Suppliers and customers enjoy formalized access to the firm's practices of service innovation development. The suppliers and the customers reciprocate this access. The customers share their preferences and preferred experience with the suppliers through the retail business model. Further, this connection gives the technology supplier a better realization of the customer needs.

Through achieving an appropriate level of customer understanding, the supplier can develop a faster and more efficient implementation process. Understanding the concept of efficiency in retailing requires an in-depth understanding of customer preferred choices as an essential component of transactions (Murray et al. 2010; Teller et al. 2016). In this type, the retailer as a service firm has already achieved a certain level of success, and the aim is to maintain the current market position and satisfy customer needs and wants. The primary focus is on the bilateral interactions between value appropriation and co-creation. As stated before, since the retail business model is becoming a platform, the retailer pays less attention to having a scientific outcome and achieving technological know-how. The technological effects of this type – however limited – are to avoid critical changes in customer behaviour and habits. As a result, the firm tends to become a passive service provider and delivers a classic demand-pull strategy for its service innovation development.

In this ideal type consumers share their roadmap and preference, giving the company and its partner much greater visibility into the consumer future requirements. Consumers and

suppliers are involved at multiple functional levels of service innovation development including participation in the development stages of technology or while interacting with the retailer in the form of shopping experience. External suppliers are further involved in interactive practices of service innovation development as well.

Engaging consumers at different stages of the technology implementation results in identifying the key differences between the customers and the suppliers. Getting to know the customer preferences improves the quality of the retailer and the supplier's information database. In this type, the retailer has reached a certain level of maturity, where the firm provides a high degree of involvement opportunities for its partners. The opportunities enable the supplier to better engage with its target market under the retailer's umbrella model. The mutual collaboration between the technology supplier and the retailer ultimately results in incremental innovations. These innovations will benefit the customer as well. Finally, this business model is mostly based on providing service exchange for different actors. The basis of service exchange benefits from the co-creation of value by the customers. It further offers a deep understanding and more efficient activities for the implementation process, primarily for the supplier and then the retailer.

9.4 IDEAL TYPE 3: PLATFORM BUSINESS MODEL

Definition: A business model that is everything for everyone, in which the principal technology suppliers and consumers become business partners and share technical and technological business risks (Figure 9.1).

Description: In this type, the primacy of service exchange is ultimately the integration of resources through the application of knowledge and skills. As the appropriation and co-

creation of value go hand in hand, they affect and are affected by knowledge intensive technologies. These primarily highlight the planning and execution role of technologies in advancing services and in a service network of activities. As a result, the service firms (i.e., the retailers) can improve the workforce delivery particularly within multiple touch points to reduce labour cost and do operations faster and cheaper (Kim et al. 2010; Neslin et al. 2014). While the use of technologies at the front end of service exchange highlights the spread of physical technologies, the need for technologies at the back end leads to software development in forms of processes and methods. Furthermore, whereas physical technologies at the front end are essential for incremental innovation, back-end technologies can facilitate both incremental and discontinuous innovation.

One important attribute of this ideal type is the firm's ability to develop technologies either internally or through an external partnership with technology suppliers. The internal or external partnership further results in the development of technologies in either form as hardware or software. In this type, technology value-creation during the implementation process of technologies extends to both the supplier and the retailer. The extreme partnership between the supplier and the retailer results in the proper management of core and complementary resources. While the retailer is the primary beneficiary, the customer becomes the ultimate beneficiary through benefiting from multiple touch points.

The platform business model for a retailer requires a higher degree of investment and development but provides absolute differentiations and long-term value for the firm. The crowning achievement of a platform business model is that it provides internal as well as external opportunities for itself, the partners and the customers. The successful platform

can be thought of as a two-sided market for the supplier and the retailer itself. On one side of the market is a wealth of suppliers providing numerous choices for improvement. On the other side, there are lots of opportunities for the retailer to choose from. While the platform business model for a retailer, as in manufacturing firms, can have two dominant forms known as internal or firm-specific, and external or industry-wide platforms (Cusumano et al. 2015; Gawer and Cusumano 2014). The internal forms for a retailer emphasize as a set of assets organized in a structure, from which a company can efficiently develop and produce a stream of activities. The external platform for a retailer provides a foundation for different suppliers, upon which they can develop and promote their technologies.

In the UK, retailers like Tesco and Sainsbury's, who try to offer everything for everyone, fit into this category. Having different channels provides multiple points of interaction and improves the firm's knowledge database. Partnership with external technology supplier results in new-to-market service innovations, while the shared sense between the consumers and the retailer results in new-to-firm service innovations. Furthermore, the value is co-created through the retailer or supplier-generated activities and practices. Although firms in this ideal type benefit from core and complementary assets as well as appropriate level of market understanding, trying to satisfy every need for the consumers does not necessarily guarantee a competitive advantage. Multichannel or omnichannel retailing leads to offering explicitly.

9.5 IDEAL TYPE 4: PERFORMANCE SEGMENTED BUSINESS MODEL

Definition: A developed business model that allows the company to begin to serve multiple market segments simultaneously as a result of effectively managing core capabilities (Figure 9.1).

Description: This business model highlights the ongoing and close collection of data to improve the quality of knowledge and skills further. The technology acts as a resource integrator to effectively manage a firm's capabilities. It plays a collective role to improve the quality of the knowledge database for proper service innovation development. The technology then plays an informative and co-creational role through improving the knowledge interaction and further sharing of the knowledge. As the use of knowledge does not consume the core or complementary asset, it also delivers significant contributions to either existing or new practices of service innovation development through effective management of the resources. Since the improvement in the management of the resources, it ultimately provides a co-creational effect. The result is engaging customers through a faster response to the customer needs and market changes. In this sense, service firms place an increasing emphasis on understanding the customer's needs and effectively manage their resources. As a result of the understanding, the interactions with the customers at different points are improved as well (Brodie et al. 2011).

Retailers that win the battle to have a share of the market, often find themselves in this type of business model. The growth in the market that has come from having a strong market position is fuelling the ability to properly managing the core capabilities and

improves the customer perception through service innovation development. This ideal type improves customer perception through experiencing and sensing what ultimately results in the value-added brand image. Because of gaining market share, the firm's business model is now more distinctive and profitable, which supports the retailer's ability to plan for its future. An important indicator of a more planned and organized nature for managing core capabilities is the creation of roadmaps for the future technology requirements. The roadmap requires a long-term strategy for the technologies, which needs to be adopted shortly. A key objective for the management of core capabilities is to sustain the business, not just what can be achieved in a short period. The case of implementing and adopting IBM cloud services by the retailer highlights the importance of this strategy.

Meanwhile, the involvement of technology is not the only factor in here since human interactions play a key role as well. Therefore, the business model offers explicit service innovation development, which partly involves innovating service with the aid of technology to properly manage firm's resources. The business model is beginning to be multi or omnichannel with effective management of core capabilities. This leads to supportive service innovations for managing resources through the adoption of technologies. Finally, this ideal type focuses on the importance of tangible and core assets as the fundamental sources of strategic profit. The emphasis underlines the implementation of technologies for services that are distribution mechanisms in a retail service network of activities. The mechanism involves resource integration to improve the customer perception further and sustain the market position.

9.6 IDEAL TYPE 5: PRICE SEGMENTED BUSINESS MODEL

Definition: A business model that is primarily competing on price and availability of products with a particular target market (Figure 9.1).

Description: This business model represents the modification of brand name and promotion while maintaining the core service. It highlights a minor technological change, which leads to incremental innovation opportunities accompanied by promotions and awareness. Here, the technology is at the early stage of integrating resources, understanding new market opportunities, and the emergence of new practices of service innovation development as a result of the market change. The emergence of technology as an outcome begins to accompany the firm's core values to develop adjustable services. The use of technologies to match customer preferences results in offering desirable outcomes by operating in a manner that maximises the firm's objectives (Richey et al. 2008; Teece 2010b). While technology emerges as a complementary asset at first, it eventually becomes a core capability as a resource integrator of knowledge and skill for further collaboration with practices within a firm. Therefore, it represents the starting point for the technology to shift from complementary to core assets.

In this ideal type, a key objective is to manage the complementary resources by cutting costs effectively. Technologies are either completely ignored or – if adopted – are used at the early stages of service innovation development. Innovating services in this business model are primarily the result of following market behaviour or trends. Due to lowering costs as an objective, activities for technology development are mainly outsourced to external suppliers. These activities are based on explicit service innovation development

using technologies outsourced to external partners. This ideal type represents the case, where the retail business model is moving away from the classic retailing through offering price cuts and promotions. However, the retailer undertakes incremental innovations to avoid losing the price-sensitive target market. To lower the risk of adoption, in the case of developing a technology it follows the demand and preference of the consumers only.

Although a higher level of planning helps the business model appeal to different markets and create new opportunities, but the unwillingness remains. Retailers with this business model think of service innovation development from a product or technology perspective. While they are alert to opportunities within the boundaries of the current business and market, they do not see service innovation as being able to stretch those boundaries yet. The firm's business model remains vulnerable to any significant new technological shifts beyond the scope of its current practices. Therefore, the firm becomes a late adopter of the technology and practices of service innovation development. In the UK, retailers such as Asda and Wilkinson that mainly strategize to cut the cost with low degree of technology adoption fit into this category.

Operating-age companies that have built a well-earned reputation for delivering a particular set of practices are of this type. Here the firm is at the premature stages of opening its business model to new technologies. The principal objective of the implementation of technologies is the retailer's consideration of becoming a later adopter in the far future. The late adoption of self-service checkout machines by Discounters with their price cutting strategies is a proper example of this business model. This ideal type emphasizes the importance of resource integrations, where products are distribution mechanism and value can be determined by consumer's preferences and arrangement.

Finally, the business model represents a low degree of value co-creation due to matching customer preference for the market majority.

9.7 IDEAL TYPE 6: COMMODITY FOLLOWER BUSINESS MODEL

Definition: A late follower business model, which competes on availability and providing ease of access to the products (Figure 9.1).

Description: Involves changing the service and other mixed elements to fit the new target market. While in the price-segmented business model, the technology is on the verge of shifting from complementary to core integrator of knowledge and skills; here the technology has made the transition as a result of key changes in the practices of service innovation development. Although the firm is still a late adopter of the technology, a key difference between the commodity follower and the price segmented business model is the firm's desire to attract different target markets. A good understanding of the new target market has been achieved, and the firm uses the technology for a better fit between its core values and the new target market.

The key transformation here is that with the commodity follower business model, the technology is used to modify service innovation development and accommodate the new market position. The primary objective of the technology is to facilitate an effective integration of resources for back-end operations. The allocation of resources depends on the marginal contribution of the firm, competitive response within the market, and how to effectively manage the firm's dynamic capabilities (Polo and Sese 2016; Teece 2010a). As a result, firms start adopting incremental and radical technologies in response to various market demands.

The primary objective of this ideal type is to effectively manage core and complementary assets through providing ease of access. Since firms in this type rely extensively on copying others, they seldom get new and innovative technologies implemented and later adopted. Here, the ease of access through multichannel retailing provides a certain level of market understanding. In this ideal type, firms sometimes change, either by copying an idea, observing another company or hiring an external partner with extensive knowledge, who can teach them something new. Since these companies rely extensively on others, they rarely, if ever, get technologies implemented as a first runner in the market. Any advantage that they receive is challenging to protect from other firms copying it. This is primarily because the firm is offering the common needs of multiple target markets while being at the early stages of expanding for a bigger audience.

In the UK, the late adopters of online retailing such as Debenhams and House of Fraser have adopted the same business model. The primary motive for these firms to implement technologies for multichannel retailing was copying their key competitors. A firm with the commodity follower business model lacks the ability to control its destiny and designing long-term strategies. In many circumstances, when a superior service with a unique technology comes into the market, the company lacks the business model to respond. Also, the retailer lacks much of a process to innovate and develop its intellectual property and technological know-how. However, the adoption of multichannel retailing by the retailer with this business model results in improving methods of service innovation development for its customers through a trial and error process. Any market understanding and technology implementation is also the result of offering different

channels. Finally, this business model involves all social and economic actors to integrate resources and deliver value for short-term mutual benefits.

9.8 IDEAL TYPE 7: ASSET ADAPTIVE BUSINESS MODEL

Definition: An open and adaptive business model, which is committed to experimentation and adaptation of core and complementary assets (Figure 9.1).

Description: This business model involves offering the same type of service to the same target market but in a different manner. In many levels, after a firm with the commodity follower business model plans for service innovation development and implements new technologies, it adopts the asset adaptive business model. Once the firm is facing increasing demand for value-added services, it implements new technologies and the possibilities to expand quickly. To increase its operating scope, the firm assesses its current practices and core assets to adapt them to new services. Here, the firm focuses on its core capabilities and integrates its complementary assets in the form of technologies. While there is a considerable emphasis on core capabilities, technology is implemented as a revised complementary asset. The implementation of complementary assets provides an understanding of new opportunities and market trends. Here, the primary focus of implementing the technology is in the service delivery. The implementation and further adoption of the technology may also result in new interactions and practices or service innovation development.

Firms with asset adaptive business model respond to changing customer desires through the application of technologies, which makes multiple changes to the core service. Since the objective is to concentrate on the interactions among different actors, it further

improves the association among practices and actors as well. This is of particular importance since actors in service ecosystems cannot deliver value alone, but their interactions play an essential part in the creation of new associations and value offerings (Vargo et al. 2015; Vargo and Lusch 2016). Therefore, the technology improves the nature of interactions among actors. Also, the collaborative relationship among actors provides mutual benefits and improves the nature of technology.

For instance, many retailers have developed their mobile apps to engage with their customers and promote their brands. The interaction, which was originally developed through the in-app shopping features, has resulted in an additional adoption of the technologies. Retailers now offer apps not only for shopping purposes but for engaging with their customers at a different level. As a result, many retailers use social media apps such as Twitter, WhatsApp, Snapchat etc. as a tool for after sale and customer services. All the mutual impacts of the interactions and the nature of technology result in engaging customers and achieving customer lock-in in asset adaptive business models. One important attribute of a company with this business model is its desire to innovate its business model. This requires a commitment to experimentation with one or more business model variants. The business model also requires exploring alternative ways to profit from innovation, either the technology or the service.

In this ideal type, the firm motivates customers to keep using the products and further benefit from services through the emotional interactions with them. While engaging customers through emotional interactions ultimately results in the lock-in effect, the firm simultaneously improves its service innovation development. The progress happens through the introduction of software to fit the customer needs properly. Use of mobile

apps and social media are good examples of matching customer needs in an asset adaptive business model.

Furthermore, the business model plans to improve the brand image and provide lock-in ultimately. Therefore, an emerging focus on the internal technology development and offering supportive services will emerge. The growth of e-commerce has led firm's core and complementary resource to be adaptive, which will result in improving Internet-enabled services. Finally, in this business model, the beneficiary determines the extent of the value through re-defining the practices of service innovation development.

9.9 IDEAL TYPE 8: DIFFERENTIATED ONE-HIT BUSINESS MODEL

Definition: A business model that differentiates target markets from those buying solely based on price and availability while benefiting a period of growth as a result of customer lock-in (Figure 9.1).

Description: The differentiated one-hit type represents the notion where both service and marketing exchange elements are revised. This business model is solely based on intensive levels of customization due to understanding customer preference in detail and achieving customer lock-in. Focusing on the core or complementary assets may lead to capturing new target markets. However, here the aim is to focus on market segments with specific and unique needs solely. The technology creates new services and probably defines a new value for the firm. Some might argue that practices resulting in customized products do not deliver the detailed and intensity required for a business model (Amit and Zott 2010; Schneckenberg et al. 2016). The analysis of the data in this research highlights that definitions of business models vary to some degree. For a retailer competing for different

target markets, business models are the intended ways that the firm makes money out of their ideas, resources, and technologies. The methods can perform as a business model representing the entire value delivery activities of the retailer. Alternatively, they could be part of a long-term strategic plan for managing core and complementary resources.

As a result of market understanding through the application of technologies, the existing practices are reinforced, or new sets of activities for service innovation development are created. This business model allows the firm to serve a different and less overfilled market segment. The ability to differentiate itself from its competitors supports a period of growth for the company. If the differentiated service as a result of applying the technology is high enough, the company may also enjoy a period of above-normal profits. Therefore, the emerging service benefits from the new technology at the forefront of interactions with the customers. It also attempts to satisfy the customer and offer lock-in ultimately.

For this ideal type the application of technology is ad-hoc in its nature, and in some cases, the budget is dictated by the opportunities emerging during the technology implementation process. If the company succeeds to provide lock-in, it is for a limited time due to little consistency and inability to maintain the intellectual property of the technology. In this business model, the company may lack the resources and stay in power. It may also be unable to invest in the supporting innovations to sustain its differentiated position. A performance advantage can only be sustained through the generation of new service offerings. Therefore, any current advantage may eventually be subsiding as others copy, catch up, or perhaps overtake that enhancement. Unless the business model is extraordinarily successful, they lack the ability and funds to innovate services beyond extensions of the first concept continually. The example of the

emergence of loyalty programs, where there used to be an enormous success and customer attraction after its launch, illustrates the success of this business model concept. However, the plan of loyalty program has been unable to hold up its achievements and success ever since.

Furthermore, the application of technologies for service innovation development is limited in this type. A fundamental problem with having one-hit wonder business model is that there is not enough depth of investment to support and sustain the business model. When a technology is implemented and further adopted, limiting the cost and providing lock-in through direct and physical interactions with the technology becomes a challenge for the retailer. Finally, the value is co-created by the customer as the key beneficiary through providing information about their preference.

9.10 IDEAL TYPE 9: ACTOR RECIPROCATED BUSINESS MODEL

Definition: A business model that integrates various resources to provide ease of access and ultimately satisfies consumer needs by offering new market behaviour (Figure 9.1).

Description: This business model represents a major technology change accompanied by target market shift and changes to the core value offerings. The actor reciprocated business model occurs when an innovative set of value assumptions and managing practices is introduced into the existing or new market. The integration of core capabilities typically leads to the development or ownership of technology in the form of new intellectual property. This ideal type signifies a rare type of innovation in service ecosystems where the customer involvement plays a dominant role in the value creation or co-creation network. It requires a long-term emphasis on achieving technological know-

how and providing supportive services. The technology has a key role as a core asset. The firm would revisit and restructure a developed method of using the technology, which has already been used by external industries (usually those with a higher rate of expenditure on research and development than the retail sector). The new technology provides ease of access typically and improves the selection of touch points with the firm, which can deliver lock-in to the customers.

A retailer with the actor reciprocated business model uses its understanding of customers and suppliers to identify discrepancies and disconnections between the customer or suppliers perception and the firm's business model. The firm's intention to do so takes place both in the current and the new business areas and market opportunities. These issues are proactively identified, and actions are taken to reciprocate the situation so that the company maintains alignment of its business model with that of its customers and key suppliers. Now the company can forge strong alliances and partnerships with technology suppliers, as they tap the market opportunities into new areas. Because the investment and risks are shared with its suppliers, the company with its suppliers can search and serve for further advancements and obtain technological know-how. Achieving this knowledge enables the retailer to further receive a profit jump, at least for a short period. The retailer not only can offer its business model to external parties to incorporate their technologies and knowledge of know-how; the firm can also offer its technologies to the external suppliers.

A retailer with this business model requires extra time to consider a technology as the firm looks for consistent technological shifts or opportunities of service innovation development that result in lock-in. Multichannel retailing results in improving methods of

understanding customer's preferred channels. Further, market understanding and technology development is the result of offering different channels, which eventually leads to achieving technological know-how by the retailer and its supplier. Having different channels and aiming for lock-in ultimately holds the potential for new-to-market services. Providing different points of interactions to achieve lock-in leads to innovating services mainly with the aid of technology. Finally, here, different actors including the retailer, the supplier and the customer are considered as resource integrators and the beneficiary. While in a service network of activities the beneficiary always determines the value, here, all the actors continuously co-create and determine the value.

9.11 CONCLUSION

This chapter elaborates nine types of business models in retail. The business models are the outcome of the in-depth qualitative interviews with key informants and the case study research. The findings from the case studies as well as the follow up interviews confirmed the presence of different business models. They also supported the need for a unique set of practices and value creation activities (known as a business model) depending on each category of technologies. For each business model the process of interacting with the market, the requirements, the practices of service innovation development, and the role of the actors involved in the technology value-creation processes were explained (see Figure 9.1). The degree of integrating capabilities into the appropriation and co-creation process varies for each business model.

The chapter has also drawn from the business model, service innovation, and retailing literature to create a typology of business model innovation as a unique way of building

theory. The discussion and finding of the research helped the researcher develop a typology that facilitates the interactions between value drivers and the establishment of technology (Figure 9.1). They also inform the business model literature, which is dominated by manufacturing perspectives (Teece 2010a; Zott et al. 2011). It represents the interactions among the elements of a business model from the standpoint of a retailer as a service firm aiming to benefit from technology. The research shows how the interactions between technology, its value drivers, and practices of service innovation development create different types of business models for retailers to profit from innovation in general (Figure 9.1). This viewpoint highlights the importance of delivering value and adopting innovative content in a business model. The business model literature highlights the critical role of embedding technology, creating value, and appropriating value separately. Although this aspect of connection is critical in a business model (Zott and Amit 2010), but its relevant literature rarely connects these three elements nor does it provide a robust theoretical and empirical foundation that explains their interplay (Amit and Zott 2015; Zott et al. 2011).

The common understanding of the business model literature characterizes it from the viewpoint of the producer solely (e.g., firms) (Amit and Zott 2012). The conceptualization in this research highlights that a business model for a retailer is not unique to co-creation or appropriation of value by the firm exclusively. Rather, the combination of value drivers and technology rely on the business model since all of them rely on views that the key elements of a network can interact with each other (Wieland et al. 2017). This view overcomes the traditional standpoint, in which firms develop their business model to profit from innovation alone. Instead, service firms require a multilateral and adjustable

model to benefit from innovation. The viewpoint conceptualizes the business model concept from one that focuses on how to define value propositions and venture strategies (Magretta 2002; Snihur and Zott 2014), to one that highlights the broad integration of technology, its value drivers, and the practices of services. These practices result in the structure to take place, interact, and collapse continuously. The understanding of how a retailer can benefit from innovation content, puts technology value-creation and its interactions with the practices of service innovation development at the heart of the retailing discipline.

The value-based nature of business models explains why, despite different definitions, the business model is mostly developed according to the phenomena of interest of the respective researchers. As such, firms have to concentrate on a particular dimension of value to commercialize innovative ideas and technologies (Zott et al. 2011). When a business model of a retailer is focused on one aspect of value more than the other, where limited attention is paid to the establishment of technology, a transfer of value for money is developed. In this case, the firm's activities are in favor of a particular service category with rather static customer needs. However, when the business model of a retailer is framed based on the interactions between value drivers, the application of technology, and the continuous practices of service innovation development, the retailer is more likely to negotiate the roles. As such, the retail business model accounts for continuous and discontinuous innovation along market change. Different cells presented in the typology of retail business model provide examples for various types of technology and market change.

CHAPTER 10 CONCLUSION AND IMPLICATIONS

10.1 INTRODUCTION

The different practices of service innovation are particularly those centred on opportunities provided by technologies and changing market behaviours. Over the recent years, an emerging solution has become the utilization of new technologies within different channels of retailing. Within the UK retail sector, increased competition from both the retailers and the technology suppliers has placed greater emphasis on understanding the role of technology. Utilizing technologies provides firms with opportunities to create value and manage their capabilities properly. History has shown that the critical role of technology is offering firms new opportunities to improve the services and add value to their brands. However, understanding the vital position of technology and its value drivers remains a critical issue for many firms. For researchers studying the important foundations of technology, service innovation, and business model innovation in retailing, much work lies ahead. Although the typologies of technology spectrum and retail business models are a good start, more research is needed to clarify the concepts and to further test them empirically. A rich theory that expands the consequences, and dependent variables, and different aspects of business model innovation needs to be developed and linked to the extant theoretical framework to match the requirement of different service firms better (Greenhalgh et al. 2004; Ostrom et al. 2015).

Furthermore, this research contributes to the theoretical and practical knowledge gap for specifying different modalities of interdependencies among the elements of a retail

business model and its value creation elements (Dotzel et al. 2013; Sorescu et al. 2011). To better explain the contribution of the frameworks and empirical models developed in this research, there is a need to elaborate on the theoretical, practical and managerial implications of this research. The frameworks, typologies and the process model presented in this research, provide performance benchmarks for the service firms in general and the retailers in particular. They enable the retailer to set up continuous improvements along as many of the nine cells presented in the typology as possible. In addition, the typology of technology spectrum, typology of retail business model, and the implementation process model can be used as a checklist of expected outcomes with regards to technology value-creation and service innovation development.

10.2 EVALUATION OF THE SUBSTANTIVE FINDINGS AND CONTRIBUTIONS TO THE LITERATURE

10.2.1 DEVELOPMENT OF THE CONCEPTUAL FRAMEWORKS

The conceptual frameworks developed in chapter five (see Figure 5.1, 5.2, and 5.3) provide a lens to view the fundamental role of the technology as a solution to capture the fruit of service innovation. They further explain how the technology can create value through investigating its value drivers and key activities. Prior research has uncovered the utilization of technologies for advancing services and the opportunities it provides within the increasingly competitive retail sector (Brynjolfsson et al. 2013; Evanschitzky et al. 2015; Patel 2014). As a result, the understanding of technologies provides the firm with the opportunities to improve its services and develop technical or economic (rather than perceptual) value proposition (Lilien 2016; Vize et al. 2013). The frameworks and the

substantive finding including the typologies and the process models also contribute to the literature and broaden the scope of using technologies for innovating services (Lusch and Nambisan 2015; Vargo et al. 2015; Wieland et al. 2017). They expand our understanding from a focus on technology only, to a comprehensive understanding of the role of technology, its value drivers, and its interactions with service innovation in a retail context (Brynjolfsson et al. 2013; Sorescu et al. 2011).

The conceptual frameworks incorporate theories of profiting from technologies and service-dominant logic in a service environment. This is particularly due to the fact that there is a need for a more integrated and comprehensive framework that can provide a deeper understanding of about how new technologies emerge and perform in the value chain (Brynjolfsson et al. 2013; Vargo et al. 2015; Vargo and Lusch 2017). Furthermore, the frameworks present a new perspective towards understanding the role of technology in B2B Markets, where the retailers are the key customers of the upstream technology suppliers. This fulfils a knowledge gap in the B2B setting, since through the incorporation of technologies in a B2B marketing venue the firms interact with fewer but more real customers, incorporate a significant component of long-term strategic value, and see far larger individual transactions (Lilien 2016; Vargo and Lusch 2017).

10.2.2 THE EMERGENCE OF AN INTEGRATIVE MODEL

The review of the literature and the development of the conceptual frameworks alongside the two phases of the data collection have resulted in a more in-depth understanding of the role of technology and its interactions with its value drivers for innovating services. This view focuses on the nature of technology in retail while it explains how the

technology emerges and becomes mature over time. As a result, a service ecosystems perspective for understanding the role of technology in value chain intermediaries and its key interactions was emerged and developed. In particular, the service ecosystems perspective extends and improves our understanding of an organized view of profiting from technological innovations (Teece 1986, 2006), within a B2B marketing paradigm involving actors and activities (Vargo et al. 2015; Vargo and Lusch 2011).

In contrast to Teece's (1986, 2006) proposition by considering technology as the core offering, in a retail network of activities, the primary focus is on designing new services or development of the existing ones (i.e., the proposed paradigm of service innovation development). In this retail network, the technology ultimately inspires new norms and practices, which in turn, affects the current practices and shared understandings. Retailers operate within a paradigm based on disrupted or threatened practices or expectations (such as traditional brick and mortar stores against online retailers or the traditional payment methods against the contactless payments).

Teece (1986) and Pisano & Teece (2007) propose that creation of value occurs in networks with operations alongside firms and its partners. In this emerging interactive model, as technology is evaluated and then applied as an outcome, it takes on new norms and practices while revisiting and inspiring the value drivers interchangeably. A bilateral network of interactions between appropriation and creation of value (rather than co-creation of value as proposed in this research) leads to the distribution of returns and the emergence of technologies for the retailers. The rise of technologies then results in an open, adaptable, and multifunctional network of premises including value appropriation, value creation, and technologies. For instance, the emergence of new forms of checkout

experience and payment systems in retail highlights the dichotomy of this process. The process underlines the mutual interactions between the dyad network of activities and technology.

As a request for efficient and effective operations, self-service checkout machines have been designed for more than two decades now. However, they are surrounded with contradictions and conflicts (e.g., the need for faster tasks and payment methods against the necessity of human interactions for some offerings). Through the development and use of these freshly designed technological platforms, multiple actors including the firm, the supplier, and the customer participated in the development of the practices of service innovation development. Whereas some customers use traditional cash or chip & pin payments and use vouchers, others keep up with the latest trends by using Apple Pay and loyalty cards. Thus, the demand for efficiency creates the need for technology. Additionally, the technology itself inspires and leads to new practices.

Teece (1986, 2006) propose that there are different systems (business models) that each can be employed at a time, where some will be better than the others. In his view of business models, refining insights and activities lead to every actor enjoying a piece of the innovation pie. However, for the retailers, mainly since the value drivers evolve, some actors may not profit, and may even be destroyed. Furthermore, in a B2B marketing setting, it is likely that service firms break into different segments and try to duplicate each other's models as passive followers. For instance, in the UK, retailers like Ocado place a high emphasis of appropriation of value by building technologies in-house. Ocado further develops the technology by cooperating with upstream technology suppliers before to the final rollout of the technology. In this market, discounters like Lidl and Aldi

maintain a lower level of interactions with the upstream suppliers through improving the creation or co-creation of value. They position a greater focus on the value creation by cutting the cost and understanding consumer needs.

10.3 REVISITING THE RESEARCH OBJECTIVES AND THE RESEARCH QUESTIONS

This section aims at discussing the four objectives of this research, which were presented in chapter one. It explains how answering the two research questions presented in chapter one has resulted in achieving the objectives. In doing so, the objectives one and two are linked to the first research question while the third and the fourth objective highlight the importance of the second research question.

10.3.1 OBJECTIVE ONE: TECHNOLOGY IMPLEMENTATION PROCESS

To identify different processes and practices performed by the retailers and in collaboration with the technology suppliers before the final adoption or rejection of a technology in the UK retail sector.

This research focuses on the implementation stage of the adoption process (Rogers 2003; Venkatesh et al. 2012, 2017). In this stage, retailers identify new technologies, through collaboration with upstream technology suppliers, and engage in assessing aspects such as operational, commercial and business considerations (Brynjolfsson et al. 2013; Sorescu et al. 2011). Retail firms are pushing and being pushed to implement new technologies to improve their efficiency and effectiveness (Oh et al. 2012; Richey et al. 2008). Still, it is somewhat non-traditional for retailers to initiate technological change even in tight relationships with upstream technology suppliers (Pelser et al. 2015). Unsurprisingly

retailers are unsure where to make investments and which technologies to implement and adopt within their businesses. It is the construct of value, which this research argues, that provides a unique opportunity to implement these technologies. While the implementation process of technologies in retail has been explored, there remains the need to uncover different the value potentials of different technologies in this stage. Therefore, during the selection of the case studies, besides the stage, which the technology is currently at, there are different factors among the cases including: the size of the technology provider that developed the technology; the key characteristics of the target or mass market, which the technology was introduced; the degree of technical development complexity; and the effects of the practices in the implementation stage on the final adoption or rejection of the technology.

This objective has been achieved in chapter seven of the thesis through having in-depth and semi-structured qualitative interviews with the key informants. The key informants were selected from the technology suppliers in the UK retail sector. The findings provide evidence for the overlooked process within the innovation decision-making known as the implementation process (Rogers 2003). Exploring the implementation process of technologies in the retail sector has led this research to uncover unexpected activities that conform to the model of reality regarding the importance of technologies for advancing services. It highlights the importance of considering value drivers for this process before the final adoption or rejection of the technology. This finding further requires the investigation of the activities within the implementation process. It also builds up the context for the case study analysis (Yin 2014).

10.3.2 OBJECTIVE TWO: FEATURES OF THE IMPLEMENTATION PROCESS

To demonstrate the key features and benefits of the implementation process of technologies using case studies of different technologies, which have been implemented/are being implemented before the final adoption or rejection stage in the UK retail sector.

Numerous studies have highlighted the ability of significant retailers to adopt a new technology or promote a new technology in highly concentrated markets (Evanschitzky et al. 2015; Venkatesh et al. 2017; Vize et al. 2013). However, a few studies, if any, explore the practices and key benefits of the activities that take place before the adoption stage. Research in retail marketing largely ignores the fact that it is the activities before the adoption of technologies, not the technologies alone that genuinely impact retailer's performance. Retailers who collaborate with their technology suppliers hope to reap operational effectiveness and efficiency and achieve superior financial performance (Kannan and Li 2016). Retailers are often unwilling to engage in such technological collaborations (Richey et al. 2008; Sutton-Brady et al. 2015).

This objective has been achieved partly in chapter seven and chapter eight as a result of exploring different case studies. In-depth investigation of the implementation process in chapter seven resulted in better understanding of the activities and operations that both the retailer and the technology supplier consider before, during, and after the collaboration. Furthermore, exploring different case studies in chapter eight have resulted in a better understanding of the key features and benefits of the implementation process. It contributes to the knowledge gap by exploring how different groups of technologies

create value for innovating services during the implementation process. It also improves our understanding of the level of importance of different steps within this process. The case studies suggest that retailers often avoid adopting technologies or engaging in technological collaborations because they do not live up to the billing of their business partners. However, some research notes that supplier promised improvements often fall short regarding service ratings, cost containment, and overall performance (Autry et al. 2001; Evanschitzky et al. 2015).

Finally, while chapter seven shed light on the different steps in the implementation process of technologies, it built up the context for further investigation regarding the interactions between technology value-creation and service innovation development using a diverse range of technologies from the UK retail sector. Therefore, considering the result and analysis of the data collection presented in chapters seven and eight, the first and the second objectives have been achieved carefully. This investigation has also enabled the researcher to answer the first research question presented in chapter one properly.

RQ 1: What are the processes and practices for the implementation of technologies performed by the retailers?

While the answer to this research question is presented in chapter seven with more details, to summarize, the implementation process of technologies performed by the retailers in the UK retail sector consists of nine stages as below:

1. Absorption: scanning the current market to providing a clear understanding of the latest trends and updates, primarily involving customer experience.

2. Investigation: obtaining further information about the technology.
3. Pick up: the beginning of firm's desire to pursue a technology more structurally.
4. Tender process: a sealed bid or offers document submitted, containing detailed information and in response to a request.
5. Idea development: developing and communicating ideas, which are abstract, concrete, or visual.
6. Enhancement: achieving the ultimate results of the idea development by submitting a request for proof of concept to its nominated partners.
7. Application: reaching the extent of customization over software development.
8. Impact: budget allocation and understanding the total cost of ownership (TCO).
9. Rollout: formal launching of the technology with media fanfare and following a promotional campaign.

10.3.3 OBJECTIVE THREE: TYPOLOGY OF TECHNOLOGY SPECTRUM

To provide a classification of technologies in the UK retail sector, which highlights how different groups of technologies create value for innovating services during the implementation process.

Technologies are increasingly changing the UK retail market (Raconteur 2017a). For instance, digital technologies are reducing the difficulties of information processing between the customer and the retailers significantly (Kannan and Li 2016). Understanding the interactions and the role of technologies among multiple actors starts with exploring

the key purpose for each technology (Gallouj et al. 2015). While retailers may have the same goals for the adoption of different technologies, their strategies for creating value in different forms vary extensively (Brynjolfsson et al. 2013; Sorescu et al. 2011). Furthermore, market behaviour is rapidly changing as a result of access to a diverse range of technologies including hardware or software and in the online or in-store context (Grewal et al. 2011; Grewal and Levy 2009). This creates a need to precisely explore the value drivers behind technologies, the key purposes for implementing them, and how they impact innovating services. As the role of technology in the retail industry was explored carefully in chapter four of this study, a clear insight became evident from the review of the relevant literature and the integration of the key theoretical domains (i.e., Rogers 2003; Teece 1986, 2006, Vargo and Lusch 2004a, 2016). That is, a classification of different types of technologies in retail that offers insight about value appropriation and value creation/co-creation (Sorescu et al. 2011; Wagner and Benoit 2015); without placing unnecessary emphasis on the former or the latter was missing.

This research highlights that the business model for a retailer (as a service provider) not only highlights the role of technologies to capture the fruit of service innovation but also underlines the importance of a network of value drivers. This is important as the service marketing literature (with a primary focus on S-D logic) rarely connects these three elements (Lilien 2016; Vargo et al. 2015). Furthermore, it does not offer a rich theoretical foundation, which explores their back-and-forth processes and the role of technology among value chain intermediaries. A large portion of the retail literature as presented in chapter four focuses on the importance of technologies for improving customer experience. However, the majority of the research in this area is oriented by the impacts

of self-service technologies (e.g., self-service checkout systems or kiosks). Offering a generic typology of technologies in the retail sector, which classifies different technologies into different groups, has remained a gap within the B2B theoretical and empirical knowledge.

Through achieving the third objective, this research provides a theoretical foundation that highlights the critical role of technology and its interactions with its value drivers. The theoretical foundation can be further developed and empirically tested as a part of a new research project. In doing so, the research adopted a case study approach to explore real-life examples properly.

Through the process of case study and the integration of value drivers, the research developed a typology of the technology spectrum. The typology characterises a three by three matrix with nine cells. Each cell represents a unique implementing technology as a result of integrating two key practices of value (see Figure 8.1 in chapter 8). The typology of technology spectrum highlights an overview of different types of resource integration and interactions. It also shows how different technologies create value for innovating service during the implementation process. The interconnections among the various practices create the outcomes in forms of technologies. The creation of the typology of technology spectrum also allowed the researcher to adjust the findings from the case studies for each cell. Therefore, to achieve objective three, the typology of technology spectrum contains nine unique types of technologies as below:

1. The operational efficiency-customer engagement type: Payment and point of sale

2. The operational efficiency-customer preference type: Scheduling program and product management
3. The operational efficiency-channel evaluation type: Management and workforce systems
4. The operational effectiveness-customer engagement type: Internet of things
5. The operational effectiveness-customer preference type: Data analytics and e-commerce
6. The operational effectiveness-channel evaluation type: Warehousing and fulfilment
7. The customer lock-in-customer engagement type: Customer experience management
8. The customer lock-in-customer preference type: Shopper analysis and loyalty programs
9. The customer lock-in-channel evaluation type: Portable hardware

10.3.4 OBJECTIVE FOUR: TYPOLOGY OF RETAIL BUSINESS MODELS

To develop a typology of retail business models in the UK retail sector, which illustrates how different types of technologies require different types of business models to be created and developed depending on the retailer's capabilities and objectives.

It is a difficult task to offer a commonly accepted definition for a business model (Zott et al. 2011; Zott and Amit 2017). While there is a diverse literature on this phenomenon,

proposing an established definition of a business model, particularly in a competitive market such as retail, remains objectionable. Nevertheless, through the incorporation of technologies, firms can engage different stakeholders, who are involved in the operational and delivery processes, including external or existing suppliers (Lilien 2016). This creates a need to understand precisely how these technologies for service firms could be utilized to create value for innovating services, and in some cases redesign the business models (Coombes and Nicholson 2013; Ekman et al. 2016). These business models are further influenced by interactions among actors in the value chain (Vargo et al. 2015). Some scholars consider the interaction of technology and actors as ecosystems. They consider the concept of ecosystems as a type of business model that creates and plans businesses in a set of actors (Chesbrough 2010; Palo and Tähtinen 2013); is the associated transactions for the present circumstances (Zott and Amit 2010); develops different variations on the generic value chain (Magretta 2002); and provides logic and evidence for building a sustainable competitive advantage (Teece 2010a).

Fundamental to the innovation processes in retail business models are two key features retailers as 1) a retailer primarily uses technology to sell products manufactured by others and 2) retailers use technology to engage in direct interaction with the end customer (Pauwels and Weiss 2008; Sorescu et al. 2011). Retail business models not only must be developed, but they also must be managed once they are developed. Managing business models for any firm is an activity that is inherently risky and uncertain (Chesbrough 2010). There are many potential ways to use technologies for service innovation, many of which are unlikely to succeed in the competitive retail market. Further, as explained before, successful business models pose additional risks. They create a strong inertia inside the

firm that makes any change to the business model much more difficult for the retailer to maintain (Zott and Amit 2017).

Some retailers have been able to foster change in their business models. They have adopted dramatic shifts in their operations and activities. Much more have done so by benchmarking the best practices of other retailers and offering a subset of these activities within their models. This has given the retailers in the UK a sense of how to improve their business models and continuously adapt to the new changes. However, retailers need more than an awareness of the possible changes and adjustment. They also need a roadmap (e.g., the technology implementation process presented in this research) that can provide overall directions for how they might change their business models and how to implement the upcoming technologies to fit their activities and sequence the necessary changes. This creates a need to consider different business models in the form of a typology for a retailer. The outcome is presenting a typology of nine unique types of business models for the retailer each known as “retail business model”. This objective has been achieved by presenting the nine retail business models extensively and in more details in chapter nine of this study.

Finally, while chapter eight explored different case studies from a diverse range of technologies in the UK retail sector, it provided insight on the value creation potential of technologies for innovating service and further analysis of different cells in the typology. This created the need to investigate each group of technologies further and explain the retailer’s objectives concerning the creation of value for innovating services during the implementation process for each group. Therefore, considering the results of the analysis of the data collection presented in chapters eight and nine, the third and the fourth

objectives have been achieved cautiously. The examination of the two objectives has enabled the researcher to answer the second research question presented in chapter one properly.

RQ 2: How do retailers create value for innovating services during the implementation process of technologies in the UK retail sector?

While chapter nine explains the answer extensively, to summarize the answer to the research question, the retailer uses the implementation process of technologies to create value for their services within nine different forms. Through capturing and creating value, retailers offer nine unique business models. The nine ideal types represent nine unique business models for the retailers as below:

1. Externally-aware business model: Involves the early participation of internal and external technological development for different market segments.
2. Integrative-uncertainty business model: A formalized service network of activities that involves a shared sense of participation primarily from external technology providers and customers.
3. Platform business model: A business model that is everything for everyone, in which the key technology suppliers and the consumers become business partners and share technical and technological business risks.
4. Performance-segmented business model: A developed business model that allows the company to begin to serve multiple market segments simultaneously as a result of effectively managing core capabilities.

5. Price-segmented business model: A business model that is primarily competing on price and availability of products with a particular target market.
6. Commodity-follower business model: A business model that is primarily competing on price and availability of products with a particular target market.
7. Asset-adaptive business model: An open and adaptive business model, which is committed to experimentation and adaptation of core and complementary assets.
8. Differentiated one-hit business model: A business model that differentiates target markets from those buying solely based on price and availability while benefiting a period of growth as a result of customer lock-in.
9. Actor-reciprocated business model: A business model that integrates various resources to provide ease of access and ultimately satisfies consumer needs by offering new market behaviour.

10.4 THEORETICAL, PRACTICAL, AND MANAGERIAL IMPLICATIONS

10.4.1 THEORETICAL IMPLICATIONS

This research has drawn from profiting from technological innovation and service marketing literature using two well-known frameworks known as PFI and S-D logic. The conceptual frameworks helped the project develop a typology that facilitates the interactions between technology and its value drivers for advancing services performed by a retailer. This point of view and its revised perspective for Teece's framework, reveal that any attempt to implement technologies and the role they play among value chain intermediaries for innovating services for a retailer must deliberate two key areas. First, a

dyad network of value drivers, which comprises value appropriation and value creation/co-creation and leads to the birth of technologies; second, an adjustable and multilateral architecture of resource integrators, which accounts for dynamic relationships between technologies and the dyad network of value for a retailer.

Furthermore, this research shows how the nature of interactions between technology and its value drivers creates a service perspective for a retailer to adapt and adjust its business models. This viewpoint highlights the nature of activities in a retail business model while it also emphasizes on a similar set of interactions among value appropriation, value creation, and value co-creation. This aspect of interaction is critical since the business model literature rarely connects these three elements without providing a robust theoretical foundation that explains their interplay (Amit and Zott 2010; Zott et al. 2011). However, providing a clear perspective about the utilization of technologies allows for a theoretical foundation that clarifies the nature of interactions between technology and the value premises (Vargo and Lusch 2017; Wieland et al. 2017). It emphasizes on the emerging and inspiring role of technology in a network of activities.

While the role of technology requires further attention, this perspective illustrates how to consider the value creation potential of technology for innovating services in service ecosystems and particularly in retail. Given its meta-theoretical perspective (Pisano 2006; Teece 1986, 2006), profiting from technological innovation (PFI) allows revision and expansion to other theoretical conceptualizations. For instance, those used to conceptualize business models as an integrated system of interactions mostly from a manufacturing perspective (Amit and Zott 2012, 2015; Zott and Amit 2010). Thus, a revised view of the PFI for the implementation of technologies supports and informs its

integration with the understanding of the role of technology for service innovation as proposed in S-D logic (Vargo and Lusch 2016). It also informs the business model literature, which is dominated by manufacturing perspectives (Teece 2010a; Zott et al. 2011; Zott and Amit 2017), through a service ecosystems perspectives. This understanding represents the interactions among the elements of a business model from the standpoint of service firms and particularly retailers.

By this point of view, technology is the outcome of resource integration and service exchange at first, while ultimately causes the shaping of service ecosystems and practices for the retailer in the form of a retail business model. The research indicates that the role of technology among the value chain intermediaries by using the interactions between a service firm (i.e., the retailer) and the upstream technology supplier. Furthermore, a service ecosystems perspective provides a flexible architecture of technologies and its value chain agents. This perspective puts technology and value drivers at the heart of the marketing discipline. When a firm implements a technology in a B2B context, it is likely to consider that the interactions can be highly complex and involve a far wider range of stakeholders (Lilien 2016). However, when technology is established purposefully in a service network, the firm considers the trade-off between its value drivers. The potential for the technology to become the outcome or cause of a new form of a value trade-off starts to emerge. As a result, the firm can utilize technologies efficiently and thrive on capturing the fruits of service innovation. The author encourages other researchers to explore further the interactions among technologies and value drivers and the degree to which they result in improvement of existing practices or development of new ones.

10.4.2 PRACTICAL IMPLICATIONS

The application of new technologies is associated with the influence of technologies for innovating services, creating value, and offering better engagement through understanding customer needs. The result of this is that numerous technologies have been applied to the UK retail sector including self-service checkouts, contactless payment systems and beacon technology. Digital and in-store investments in developed economies such as the UK, where customers expect a wide variety of assortment options but with low prices, have become a challenge that does not come cheap. Although technology suppliers offer the retailers a diverse range of technologies, there is a high rate of failure for the technologies to go through the rollout stage or remain in the market after the initial launch.

There is a common misunderstanding that a retailer can only adopt one business model at a time. While this may apply to small and medium-sized companies, for a retailer with a diverse range of practices and different types of capabilities including core and complementary, it is plausible to adopt different business models at once. Each retail business model involves a different integration of resources, aiming at different target markets and using different technologies for a diverse range of innovative services. The findings of this research further revealed the notion that in a market where multichannel retailing is necessary and single channel retailing is not optional; different retailers adopt different business models for different channels and even different target markets. While different target markets require different treatments, retailers try to adopt different business models for various target markets. Furthermore, each target market requires the technology implementation process to be well adapted with different steps customized

accordingly, as different markets have different customer perceptions and understandings.

The first implication for technology suppliers involved in the implementation process of technologies is that there are various requirements and steps before the final adoption of technology. A key outcome of this research is a roadmap for the implementation process of technologies in the UK retail sector (i.e., technology implementation process in retail, see Figure 7.1). The technology implementation process highlights the journey including different stages that technologies go through when being considered by innovative firms. Additionally, using case studies to update and develop this roadmap has offered valuable insights to observe internal and conflicting patterns of business growth better and managing emerging technologies. It also extends our understanding and provides a fresh insight into discovering a growth path about how different technologies are implemented and result in a firm's competitive advantage. Different technology suppliers can perform within some stages very well while they facilitate the remainder of the stages just fine. Cost-driven suppliers with the in-depth knowledge and technological know-how usually keep the core technology to benefit from intellectual property (IP) and competitive advantage. However, there is an increasing level of competition from the retailers to benefit from the ownership of IP, which makes the retailers less flexible to the changes during the implementation process.

The second implication refers to the typology of the technology spectrum. Technology suppliers and the retailers should pay particular attention to the selection of the technologies and adjustment of their operational activities accordingly. The careful consideration results in the implementation of the technologies with a better fit to the

firm's value drivers and key capabilities. Currently, in the UK retail sector, technology suppliers from small to medium sized are offering a diverse range of technologies from tight (technology is relatively easy to protect) to weak (technology is almost impossible to protect). This has introduced new opportunities for SMEs to take advantage of efficiencies that historically would not have been available due to price restrictions. Warehouse management, ordering and invoicing, carrier management, and much other efficiency are now all within reach of SMEs. These small- and medium-sized suppliers are changing the face of the UK retail sector as they have high abilities to innovate and offer customization for technologies in multiple forms, hardware or software.

While some of the technology suppliers solely benefit from the partnership with retailers, others invest in their accelerators and R&D labs to ultimately benefit from the protection of intellectual properties. Since consumer trends are increasingly focused on speed and choice, the SMEs can offer convenience, cost, choice and a great customer experience, which is built into their daily activities and business models. This further means that, where there is increasing transparency on product and prices, SMEs have to compete on innovating services rather than products alone.

The third implication highlights the importance of the typology of business models for both the retailers and the technology suppliers who intend to collaborate with them. Unless a retailer is planning to enter the market as a brand new and start-up firm, they already have a retail business model. To advance a retail business model to a different one, a retailer must first assess where they are in the typology of retail business models. The critical issue for improving the retail business model or adopting a new one will depend on the type of the current retail business model. The existing form can change

based on the degree of integrating different kinds of resources, the openness of the retail business model to external ideas and technologies, and the retailer's willingness to let the technology supplier use its plans and build on them. Considering an open retail business model, it is the retailer's business model that drives its search for innovation activities (from internal or external sources). Although forming collaboration and partnerships enables the retailer to access novel technologies, but requirements beyond the interest in cooperation must occur in parallel. The mutual understanding improves the integration of capabilities and the chances of an idea, technology, collaboration, or an innovative service to be successful and remain in the market.

The final implication focuses the examination of the life cycle of the retail business model. Some retailers adopt a closed business model as R&D dominated businesses, whose internal innovation is mostly driven by technological opportunities (e.g., Ocado's substantial investments in developing management, workforce systems, vendor management, and fulfilment technologies in-house). At this stage, they rely upon internal know-how for emerging technologies and internal capabilities. Gradually, the retailer realizes that in a price-cutting market it will be difficult to create all technological capabilities alone. At this point, it starts adopting an open retail business model to integrate external know-how and technologies. This is the tipping point where a retail business model begins to shift from a technology-based model to a market-oriented model.

10.4.3 MANAGERIAL IMPLICATIONS

The managerial implications of the research are those related to the development of the technology implementation model and the adoption of a retail business model by the managers. The benefits of the technology implementation process are many; one is that the model is multidisciplinary as the retail managers can follow a set of required activities for the retailer (these are denoted along the top of the implementation process model, see Figure 7.1); and the technology supplier managers can pay particular attention to the necessary activities for the supplier (these are denoted along the bottom of the implementation process model, see Figure 7.1). As such, the balance between the retailer versus the technology supplier orientation becomes obvious. The interaction between these two groups is encouraged since different stages of the model demand various inputs to become applicable to the capabilities of the retailer and the technology supplier exclusively.

One of the most significant features of the technology implementation model and the typology of retail business models is their versatility and flexibility. In fact, part of the technology implementation process involves brainstorming its uses within the retailer and the technology supplier. This may, in fact, result to spontaneous “ah-ha” moments because of recognizing shortcomings or solution to issues with their service innovation practices. The results clearly demonstrate that innovating services through the application of technologies requires a different business model for the retailer as opposed to what they already have incorporated concerning their products. For retailers benefiting from the implementation of technologies for innovating their services, there are some universal success factors that transcend the boundaries between services and products.

The lack of alignment and the relative importance between the product-focused and service-focused business model of a retailer suggests that innovation in the two types is indeed different. As such, the retailer and the supplier managers need to have different priorities to maximize their return on innovation investment. For this purpose, the typology of technology spectrum can be helpful. The differences imply that managers need to pay precise attention to a few indicators as 1) although the typology offers nine groups of technologies, even different technologies in the same cell require delicate consideration concerning the development of the implementation process. 2) If they follow the existing business model as an illustration of how the next business model (i.e., the service-focused business model) will be, this can result in suboptimal decisions. In fact, managers must concentrate on the augmented offering that attempt to be genuinely innovative. Design-unique features and benefits, which cannot be experienced or seen until later, should not take precedence over innovating high-quality services as a part of an augmented service innovation offering. To achieve this, service innovation and particularly the implementation process of technologies for innovating services, must be open, driven by customer engagement, and processes must be in place to manage the knowledge that open service innovation generates.

The findings further indicate that managers with different priorities of service innovation development should not consider all types of service innovation in the same way. On the one hand, explicit service innovation is process-based and primarily delivered with the aid of technology. Innovating services in this category requires mechanisms to manage the large amounts of explicit information generated to build synergies with existing database systems. On the other hand, tacit and experimental service innovation is more dissimilar

because of inconsistency in human performance (Dotzel et al. 2013). As the services being innovated are becoming fuzzier, the implementation of required technologies tends to be more complex. Hence, more effort and resources are needed in controlling and progressing the process as well as the team doing the service innovation development (Storey et al. 2016).

Generally, the results show that if the objectives of the retailer are immediate success, then they should focus on the existing practices of service innovation development, using existing capabilities, in a carefully selected target market, and putting efforts into effectively launching service improvements. However, if the objectives of the retailer are to develop long-term success plans using firm's capabilities, the aim should be being more innovative by directly involving the customer and investing in the practices of service innovation development that lead to radical improvements. This must further be supported by investing in the quality of the services delivered through the application of technologies. The impact of the implementation of technologies should also be built into the tools that the retailer employs to prioritize projects and manage their service innovation portfolio.

10.5 LIMITATIONS AND AVENUE FOR FUTURE RESEARCH

The findings of the case study research may have limitations regarding generalizability. Further research can benefit from testing the validity of the business models in a different service environment than retail. Quantitative research can also be beneficial in this area. Access to respondents within the in-depth qualitative interviews and case studies proposed a significant issue. The voluntary nature of the respondent's involvement

resulted in personal interest mainly since the project focuses the role of technology. Engaging with technology suppliers at a firm level remained a critical challenge, which in some cases restricted the access to primary data. Also, across the case studies, there was a bias towards individuals involved in front-end innovation. As such, the future research will benefit from knowledge transfer projects (KTPs) where there is a certain level of commitment to providing the required information to the research project.

For this research, access to the data collection sample was also restricted and based on respondent's availability. As a result, all key sales and marketing directors could not be involved in the research. Therefore, the generalizability of this research may remain an issue to some extent. This research project was limited to a sample of 25 semi-structured interviews from the key informants supplemented with case studies in the UK retail sector. It cannot claim that the typology of business models adopted by these cases is unquestionably applicable in every service context in the UK or other countries. The typology presented in this research as well as any typology in general have the potential for a complex theory that is subject to empirical testing (Fiss 2011). While the research argues about how different types of technologies result in different value drivers, various service innovation, and business model change, it does not explicitly state why the set of different types should predict such a change across different firms. What the research implies here as a theoretical assertion regarding the fit of technologies into different cells, makes the allocation of them inclusive as they could fit into multiple cells at the same time. In fact, because of this unique and classic feature of the typology, it meets the criteria of building a theory (Doty and Glick 1994; Snow and Ketchen 2014). Despite these limitations, the research delivers a significant advancement regarding understanding the

role of technology, the diverse practice before the final adoption, and a generic classification of different business models for service firms in general and retailers in particular.

An area for further investigation will be the degree of integrating firm's capabilities including core and complementary into the appropriation and co-creation processes. Further, a perfect typology requires different ideal types, where each ideal type comprises of different dependent variables. Thus, future research should move from exploratory to explanatory to identify various internal elements that drive the innovation engine for implementing technologies within each business model. Using multiple criteria decision analysis for each cell to define each dependent variable, as a success or failure factor of a business model can be another area for future research.

Furthermore, understanding different steps of innovation decision-making in retail including, knowledge, persuasion, decision, implementation and adoption remain unclear within service innovation and retailing literature. Although retailers are traditionally considered as low adopters of technologies, many of them in the UK are extensively investing on building technologies in-house and getting the intellectual property. However, their level of collaboration with external technology providers remains unexplored. Retailers and suppliers collaborate at different points of developing a technology and the extent to which, they engage requires further research. Therefore, future research should address questions such as: How does the collaboration with the retailer and the technology supplier lead to the development of new technologies and significant benefits for the firms? How can new routes of advanced technologies in retail

compete with the growth in the discounter segment where small margins may limit innovation investment?

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APPENDICES

Table 0.1 Preparation of the interview questions for phase one of the data collection process

Steps	Consideration
Step 1: big research questions	<p>RQ 1: What are the processes and practices for the implementation of technologies in the UK retail sector?</p> <p>RQ 2: How do retailers use the implementation of technologies to create value for their services?</p>
Step 2: mini research questions	<p>How should firms engage partners in helping them offer value through technologies?</p> <p>What are the key antecedents for practices of technology implementation?</p> <p>How should and organization focus its attention to innovate through services?</p> <p>Can firms create steadfast service innovation processes that will prevail in difficult times?</p> <p>How does the application of new technologies change the way a service delivers value?</p> <p>Where are the hidden values of new service design across firm's offerings?</p> <p>Can we create a dominant model for the retail service system?</p>
Step 3: possible interview topics	<p>The key focus of this research is on understanding the role of technology and how it results in creating value for advancing services in the UK retail sector. This requires clear understanding about different areas including:</p> <p>Understanding the importance of technology</p> <p>Understanding the activities and process happening prior to the final adoption or rejection</p> <p>Understanding the implementation process of technologies</p> <p>The impacts of technology on developing and advancing</p>

	<p>services in the UK retail sector</p> <p>Understanding the importance of service and business model innovation for the retailers</p> <p>How to adopt different business models while facing market changes</p> <p>Managing firm's capabilities efficiently and effectively</p>
Step 4: cross referencing	<p>Cross-referencing to ensure the interview questions are linked to the research questions and research objectives properly. This will offer validity to the gathered data and analysis of the data collection process.</p>
Step 5 and 6: loose interview structure	<p>The respondents' role</p> <p>Their experience of the implementation process of different technologies in the UK retail market</p> <p>Their observation of the high rate of technology failure in the UK retail sector</p> <p>Their perception of the growing importance of technology in the retail sector</p> <p>Their understanding of how the retailer's business model can add value</p> <p>Their opinion on how to manage resources properly</p>
Step 7: cross referencing	<p>Cross-referencing to ensure that the research objectives are achievable using the final set of interview questions.</p> <p>This level of the cross-referencing enables the researcher to improve the validity. Also, it connects the results of the phase one (semi-structured interviews) to the research questions and research objectives. Finally, since each phase of the data collection (i.e., semi-structured interviews and the case study research) is linked to the objectives properly, providing a flow of points among different phases of the data collection will become achievable.</p>

Table 0.2 Interview questions including main topics

Area	Main Topics	Example of Open-Ended Questions
Explore how retailers implement new technologies?	Explanation for the use of current business model	Can we start by giving me an example of a recent project you were involved in? Can you describe the implementation process from initial expression of interest to in-store application?
		How can technology suppliers benefit from the role of customers during the implementation stage?
		What about the idea of a technology-testing lab where consumers are invited in to test the product etc.?
Technological innovation/change	Attitude towards technologies	In your opinion, how do technology suppliers introduce a new technology to the retailers?
		How often/frequent is it that a firm would introduce a technology that completely surprises its competition? For instance, a retailer adopts a new point of sale technology and other retailers are completely surprised, how often does that happen?
Retail practices	Adoption or diffusion of innovation	How willing are retailers to adopt new service-based technologies?
		How willing are retailers to invest in the development of bespoke service-based technologies? How do retailers engage with partners for adopting new technologies?

Table 0.3 Interview coding process

Research questions	Research objectives	Examples of the illustrative words from interviews	Initial code (level 1, open coding)	Category code (level 2, axial coding)
Research question 1	Objective 1: Develop a roadmap for the implementation process of technologies	Quote 1	Explaining the practices before retailer's adoption	Implementation process pattern
		Quote 2	Explaining market research	Implementation process pattern
		Quote 3	Supplier knowledge and capabilities	Implementation process importance
	Objective 2: Understanding the key features and benefits of the implementation process	Quote 4	Supplier contacts with the retailer	Retailer-supplier relationship
		Quote 5	Continuous software development by the technology supplier	Attitude towards technologies
		Quote 6	Introduction of radical technologies to the market	Attitude towards technologies
Research question 2	Objective 3: Understanding the benefits and impacts of different groups of technologies	Quote 7	Explanation for the use of current business model	Retail practices
		Quote 8	Retailer's attitude towards investment on research and development	Retail strategy
		Quote 9	Discussing the use of technologies in different channels	Retail practices
	Objective 4: Develop a typology of retail business models showing how to benefit from practices and capabilities	Quote 10	Difficult task of adopting the business model to different technologies	Attitude towards technologies
		Quote 11	Improving in-store services can affect customer engagement	Service innovation development
		Quote 12	Services that can improve efficiency and effectiveness simultaneously	Service innovation development/retail strategy

Table 0.4 Case study companies - Technology providers

Name	Type of Company	Focus	Location	Number of Employees	Founded
Technology supplier 1	Technology provider, end to end service offering	Deliver transformation programs, combine performance services, added value and innovation	UK (England, Scotland, Wales, and Northern Ireland)	6700	1968
Technology supplier 2	Technology provider, end to end service offering, solution provider in multichannel retail	Create rich shopping experience including rich editorial features, blogs, shoppable videos, lookbooks, rich product configurations and personalized campaign content	Europe and North America	70-100 (including contractors)	2000
Technology supplier 3	Create, design and deliver service platforms and technology solutions	Build Cloud Services, run and integrate cloud with the traditional infrastructure, cloud advisory and adoption services, cloud migration	Europe and North America	7000	1980
Technology supplier 4	Technology supplier for process automation solutions for effective logistics	Value added logistics process automation, process optimization, provide integrated solutions, innovative systems, intelligent software and life-cycle services	Europe and North America	5000	1949
Technology supplier 5	Technology provider in fashion retail, process solution	Provide specific hardness zones and volumetric fit built to the specific requirements analysed, innovation systems and B2B service provider	Europe and North America	400	2000
Technology supplier 6	End to end service offering, R&D lab accelerator	Deliver transformation programs, intelligent software and life-cycle services	UK and North America	300	2005

Table 0.5 Details of the participants including job position and key responsibilities

Firm	Interviewee Identification	Job position/role	Key responsibilities
Technology Supplier 1	KI 1	Chief technology officer	Identify opportunities and risks for the business. Monitor technology and social trends that could impact the company.
	KI 2	Marketing and sales director	Develop and implement strategic marketing plans. Forecast to achieve corporate objectives for services.
	KI 3	Digital Marketing Manager	Devising strategies to drive online traffic to the company website.
	KI 4	Retail marketing manager	Planning and implementing promotional campaigns.
Technology Supplier 2	KI 5	Vice president of sales	Develop and implement strategic marketing plans. Forecast to achieve corporate objectives for services.
	KI 6	Technology Advisor	Evaluate new technology and makes recommendations on technological solutions.
	KI 7	Online Marketing Manager	Monitoring return on investment for the different online marketing campaigns.
	KI 8	Service Expert	Overall responsibility for improving services and customer satisfaction
	KI 9	Community Manager	Engaging with Fans and Followers to build relationships with the community and encourage engagement
Technology Supplier 3	KI 10	Social Media Manager	Continuous research into new relevant social media channels and their impact on the brands marketing
	KI 11	Vice president of sales & marketing	Develop and implement strategic marketing plans. Forecast to achieve corporate objectives for services.
	KI 12	Technology research director	Identify opportunities and risks for the business. Monitor technology and social trends that could impact the company.
	KI 13	Retail sales director	Develop sales marketing programs. Promote new products and services.
Technology Supplier 4	KI 14	Technology research director	Conducting technology and service experiments. Analyse the ROI of technologies

	KI 15	Chief technology officer	Evaluate new technology and makes recommendations on technological solutions.
	KI 16	Retail technology expert	Utilize data and shopper insights to for smooth operations among channels
	KI 17	Digital Marketing	Devising strategies to drive online traffic to the company website.
Technology Supplier 5	KI 18	Social Media Manager	Continuous research into new relevant social media channels and their impact on the brands marketing
	KI 19	Vice president of sales	Overall responsibility for brand management and corporate identity
	KI 20	Innovation Manager	Develop new services based on firm's objectives and capabilities. Improve the efficiency of the process
	KI 21	Chief technology officer	Identify competitive advantages and technological trends for the benefit of a company
Technology Supplier 6	KI 22	Innovation Manager	Develop new services based on firm's objectives and capabilities. Improve the efficiency of the process
	KI 23	Chief technology officer	Improve the technological assets of a company. Maintain current information about technology standards and compliance regulations.
	KI 24	Social Media Manager	Continuous research into new relevant social media channels and their impact on the brands marketing
	KI 25	Marketing & Sales Director	Develop and implement strategic marketing plans. Forecast to achieve corporate objectives for services.

Application for Ethical Review – Staff and Postgraduate Research Students

1. Study Title and Key Dates

1.1 Title
Value creation and the implementation of technologies for advancing services: An investigation in the UK B2B retail sector
1.2 Key Dates
Date of submission: 30 October 2016 Version Number: 1 Ethics Committee Reference Number: Intended Start Date of Data Collection: November 2016 Projected Finish Date of Data Collection: March 2018

1. Applicant Details

2.1 Principal Investigator
Name: Mr Amir Homayounfard Student Title /Role /Course of study: PhD Department: Strategy Enterprise & Innovation Faculty: Faculty of Business and Law Telephone: 07849031765 Email: amir.haman@port.ac.uk
2.2 Supervisor (if Principal Investigator is a research student)
Name: Professor Paul Trott Supervisor Title /Role: Head of the department/First Supervisor Department: Strategy, Enterprise & Innovation Faculty: Faculty of Business and Law Telephone: 02392844245 Email: paul.trott@port.ac.uk Names and email of any other supervisors: Name: Doctor Chris Simms Supervisor Title/Role: Reader in New Product Development / Second Supervisor Telephone: 02392844816 Email: chris.simms@port.ac.uk
2.3 Other Collaborators (name, organisation, role in this research)

N/A

3. Details of Peer Review

The direction and nature of this research has been reviewed by both supervisors and given its abductive nature the main focus of this review consisted of evaluating the strength of the theoretical development and providing a strong review of the literature, since the nature of the work is mostly theoretical.

4. Funding Details

This research is not funded by the government or any external organization. The main source of funding is the research student (self funded project).

5. Research Sites/Locations

The primary source of data collection is case study research with the majority of the search based on secondary data. The research provides a typology of delivering value in retail using theoretical development. It then uses case studies as the main source of secondary data to validate the typology's reliability. After the process of case study research, in the case of needs, the research will benefit from interviews with key informant in the UK retail sector. This phase does not require the researcher's visit to the research sites of firm's locations. The interviewees will be contacted via email and there is no other means of approaching them. The interview with the individuals will happen via phone call or Skype. This provides ease of access and flexibility for both the researcher and the interviewees.

6. Insurance/indemnity Arrangements

The scope of the proposed activity falls within the University insurance policies. Project proposal does not include any references to aviation, oil-rigs and refineries, nuclear, environment, asbestos, pollution/contamination or sanctioned territories and as such does not require any special/additional insurance arrangements. Furthermore, the proposed activity does not require researcher to undertake any travel that is outside of the United Kingdom

7. Study Aims and Objectives/Hypothesis

7.1 Research Aims

The objectives of this research are to answer two research questions:

- 1) What are the processes and practices for the implementation of technologies performed by the retailers?
- 2) How do retailers use the implementation of technologies to create value for their

services?

7.2 Primary Objective

These will be researched using both semi-structured interviews and multiple case studies investigating three specific areas:

- a) To identify different processes and practices performed by retailers, in collaboration with their technology suppliers, prior to the final adoption of the technology in the UK retail sector.

7.3 Secondary Objective(s)

- b) To provide a classification of technologies in the UK retail sector, which highlights how different groups of technologies create value for advancing services. This classification provides case study evidence to validate the theoretical constructs of the research.

8 Study Summary

8.1 Justification/Summary of Study (no more than one side)

It is widely recognized that the use of technologies can serve as an important strategic tool. Enabling the firm to benefit from innovation and achieve increased business profitability in a service ecosystem of activities. Research addressing the role of technologies in the theoretical entity of profiting from technological innovation (PFI) has proliferated in recent years. In parallel, the growing role of technologies within the theory of service-dominant (S-D) logic is thriving. However, firms face the difficult task of applying technologies and releasing their value creation potentials for advancing services. While the fit of PFI/S-D logic has been overlooked, insight into the importance of technology within this theoretical interface remains limited. Therefore, in this research, first, the research offers a revised perspective for Teece's works in 1986 and 2006 on how appropriability regimes profit from technological innovation (PFI). Second, the conceptual frameworks integrate the revised-PFI framework with the theoretical foundations of service dominant logic (S-D logic). Third, the research project will typology of delivering value and argues that a typology is a strong theory. Fourth, the typology will offer nine ideal types and a set of dependable variables for each using case studies from the UK retail sector.

Advances in technology are leading to a proliferation of new service offerings while changing how multiple members in a service environment accommodate and interact with each other. In this sense, the retail industry has been a recognized context for practices of technologies within the service domain. Retailers are increasingly moving towards technologies aiming at improving efficiency and productivity while cutting costs (Raconteur 2016). Incorporation of technologies not only enhances service levels, but also lowers labor operational costs (Wieland et al. 2017). As a result, technology companies large and small are offering retailers a staggering array of new technologies, from smart payment systems to in-store scanning systems for use by consumers via their smart phones (Westjohn et al. 2009).

The growing importance of advancing technologies and their impact on services is highlighted as a cross cutting priority for service research, which has the potential to impact multiple

dimensions of service. In studies by Ostrom et al. (2010, 2015) involving researchers associated with service research centers around the world, they have also underlined the importance of technology on services. Further, top journals have conducted research on this matter, including the *Journal of the Academy of Marketing Science* (2016), *Journal of Business Research* (2011), *Journal of Service Research* (2016) and *Journal of Product Innovation Management* (2017). The connection between cutting edge technologies, network of activities and service innovation practices results in sustainable benefits, competitive advantage and innovative contribution for the firm. It also influences the distribution of return among key members and value offering from firm's capabilities. Therefore, the primary objective of this research is to develop an integrative framework for employing technologies and the value creation potential, which the implementation of technologies delivers from the available profits in a service network of activities. In doing so, the research proposes two research questions and two objectives as explained in section 7.

To date, research within service marketing literature has emphasized the significant impact of technologies on different service domains (Ostrom et al. 2015; Wieland et al. 2017); the degree of market readiness for new technologies (Parasuraman 2000); and the important presence of technologies in service provision for economic exchange (Vargo and Lusch 2004, 2016, 2017). Also, innovation and/or strategy research has highlighted the role of technological sophistication for successful service innovation (Biemans and Langerak 2015; Storey et al. 2016); how to capture value from it (Dotzel et al. 2013; Jacobides et al. 2006); and how to obtain economic returns from technological innovation (Teece 2006, 2010). Despite these contributions, important research gaps remain on how the value creation potential of leveraging technologies can advance services; result in profiting from core and/or supplementary resources; and lead to changes in firm's business model and/or service practices. While the application of technologies for advancing services lays its background on different areas of the business literature, there is a gap within service management literature with respect to a theoretical (and further developed empirical advances) perspective that emphasizes on the role of technology and its impact on value through integrating key areas from which, the service domain has been derived. Also, there remains a need for the conceptual association of important theoretical entities from different areas, which highlight the role of technologies, including "Service Dominant Logic" (S-D logic) (Vargo and Lusch 2008, 2016, 2017) and how to benefit from technological innovations and available firm resources including "Profiting From Innovation" (PFI) (Teece 1986, 2006, 2010). Further, little remains known about different practices, in which these seminal theoretical works tie together (e.g., the connection between how to benefit from technologies in PFI and concepts of creation and co-creation in S-D logic).

These gaps highlight the need for understanding the role of technologies and how service firms in general and retailers in particular. Furthermore, a comprehensive review of the literature highlights the need for a general classification of technologies in retail. This classification, which will be presented in form of a typological case study, presents the value drivers for different groups of technologies used by the retailers in the UK retail sector.

8.2 Anticipated *Ethical* Issues

- **Autonomy** – the primary source of data collection in this research will be based on using case study and secondary data. The data is already available to public through websites and firm's documents. However, after the investigation of the case studies, in the case of needs, semi-structured interviews with key informants will be arranged. Key informants

describe their patterns of interactions and execution (Seidler 1974) while providing observed empirical experience as a result of advancing services through the use of technologies. Their practical knowledge can offer insight into the inner interactions of the phenomena (Kumar et al. 1993). All participants are given the right to withdraw from the research process without providing any details. Furthermore, the paternalism will aim to be avoided by using one on one interviews so no 'power' issues should arise among subordinates and their bosses as it could happen in group interviews. Also, details of interviews and transcripts are strictly confidential and will not be shared with anyone within the company regardless of their function and seniority. Also, the data will be safely disposed of ten years after being awarded the degree. Lastly, no vulnerable people will be included in this research project.

- **Non-maleficence** – The shorts interviews, which take place after the first stage of data collection using case studies and secondary data, will be collected from the managers and practitioners, who are knowledgeable in the area of understanding the role of technologies in the UK retail sector. During transcription all data will be anonymised to remove reference to individual and company names, technologies, and locations of the technology supplier facilities. All companies and individual participants will be given a specific code (key informant 1, 2, 3, etc.), which will be used in place of names, to identify transcripts. Copies of consent forms giving both codes and identifying data will be stored in separate files on the password-protected virtual storage from all other data to facilitate the security of technology supplying firms and individuals. The data will be safely disposed of ten years after being awarded the degree. Care will be taken to preserve the anonymity of individual respondents in the case of reporting back to the companies (which during the time of the research was unnecessary and did not happen) by presenting only anonymised data (removing names, firm's key activities, and job titles).
- **Beneficence** –The summary of the findings in form of an abstract, which will not included the sensitive data and only provides an overview, will be made available to participants in the case of request. Researcher believes that this should not have any impact on the likelihood of participation in the research, primarily because the main source of data collection is case study research and secondary data, which is available to the public. Here the key objective is to provide a general image about each case study in a story format. Furthermore, in the case of needs, the main purpose of the interviews with the key informants is to justify the generalizability of the stories adopted from the case studies.
- **Justice** – The research project is theoretical in nature and considering the methodology and the aim (generate theory) there are unlikely to be any lasting future consequences. The results from the study, even when published in academic journals will be generalised and rather abstract as this is the requirement under typological case study methodology for generating theory.

Furthermore, informed consent will be sought at individual participant level. Information sheets and consent forms have been developed. Each participant will be given an information sheet and a prior notice by email. The email also includes a summary of the

project, a draft of the conceptual frameworks and the matrix of technology spectrum in the UK retail sector. The researcher will explain the aims of the study and all the points covered in the information sheet and the email. If the participant agrees to participate in the research he or she will be asked to sign the consent form.

8.3 Anticipated other Risks or Concerns

Researcher will follow university's Health and Safety policy and will also use Risk Assessment form/checklist to identify any potential risks. Furthermore, researcher acknowledges four main types of possible risks. Researcher under all circumstance will aim to eliminate these risks.

- **Risks to participants:** The participants taking part in research will require investing proportion of their office or out of office timing, which is unlikely to negatively impact their work performance. This will be acknowledged and where necessary the approval (verbal or written) from line managers will be obtained. Furthermore, the length of the interviews, which will happen after the case study research, will be less than 30 minutes to reduce the disruptions to participant's working day. Also, the day and time of the interviews will be adjusted to fully suite the participant's schedule.

Researcher will try to avoid this by giving participants opportunity for voluntary participation in the study after reading the information email and the disclosed sheets, in case they would not feel comfortable in answering questions related to the implementation process of technologies. Should they decide to participate, the researcher will inform them about aims of the study ensuring the informed consent both at organisational and individual level is reached. To avoid any conflict and follow the ethical concerns, the potential possibilities of risk will be also managed by ensuring the anonymity of participants, both in academic publications and in any reports to the company concerned.

- **Risks to researchers:** The researcher believes that conducting the interviews of via skype or phone call reduces any further risks involved. However, during the processes of the interviews all care will be taken to eliminate the likelihood of health and safety issues by following Health & Safety policy and Risk Assessment.
- **Reputational risks:** The risk that can impact reputation of the university, researcher or the organisation and its employees is minimal as the topic of the research is not sensitive. Furthermore, if there will be any press articles (industry news or magazines – if pursued by organisation) as a result of this project it will likely position the classification of the case studies in form of a typology, as an innovative firm that deploys the value drivers of different technologies in retail. Equally, the positive press will rather benefit researcher and the university positioning them as the innovators who offer practical solution to the wider industry. Lastly, popularising this research project in media can also help university to attract KTPs (knowledge transfer programs). However, all names and institutions will be anonymises when communicating with press.
- **Security risks:** Due to the nature of this project there is no identifiable risk that this research can possess to the national security.

8.4 Medical Cover (if applicable)

Medical Information: N/A

a. **Medical Category (1-5):**

Category 1 Paramedic or medic in attendance as determined by the IMO.

Category 2 First aider present. A 12 lead ECG is required pre-testing if: participants are beyond their 30th birthday; they display any other questionable characteristics; they have a family history of sudden death; they have no previous experience of maximum exercise. The ECG is to be reviewed by the IMO.

Category 3 First aider present

Category 4 First aider available for consultation (present within the building)

Category 5 No first aid cover required

b. **Independent Medical Officer (IMO):**

c. **Medical cover provided by:**

d. **All procedures within Schedule of Approved Procedures (e.g. DSES): Yes/No***
If "No", please give brief details here.

9 Description of Research Method/ Protocol

This research aims to provide a clear understanding of the implementation process of technologies and their value drivers using case studies and semi-structured interviews (Creswell 2013; Huber and Van de Ven 1990; Yin 2014). Process studies are centrally concerned with how change unfolds in the entities or things being studied (Van de Ven 2007). Through exploring the implementation process of technologies, the research aims to examine the research questions primarily dealing with how things change and develop over time. By exploiting differences in the kinds of knowledge that scholars and other stakeholders can bring forth on a problem, research can produce knowledge that is more penetrating and insightful than when scholars or practitioners work on the problems alone (King and Horrocks 2010; Yin 2014).

The research approach is developed using the concept of typology and the case study approach. A typology refers to a conceptual set of unique types, which show organized connections (Hambrick 1983). A typology categorizes multiple modes as theoretical constructs, each of which illustrates a combination of activities that result in different outcomes (Mills and Margulies 1980). While typological theories using technological innovations are exclusive and entirely different from simple classification systems, they meet at least three important requirements of being a theory as well. This research will argue that unlike the negative understandings as typologies are not theories, a typology of technological innovation within service domain is in fact a strong theory for three reasons. The discussions in this research will be developed by positioning the typology of value creation potentials of technologies based on the categorization provided by Doty and Glick (1994) and further supported by Snow and Ketchen (2014).

In a typological case research, a categorization for multiple sets of activities are created, whilst different case studies are allocated as inductive examples for each combination of activities. Since typological case research is based on unique types of organizations, it allows the researcher to identify structural sets - however not existing yet - that can improve organizational effectiveness (Fiss 2011). As a result, if these structural sets are well presented and explained, they will enable researchers to define new constructs (ideal types) and set of rules (dependent variables) for the current outcomes of service organizations (Mills and Margulies 1980). Thus, using typological

case research allows researcher to develop new theoretical advances whilst suggesting further empirical methods. In order to consider typologies as theories, one has to understand that typologies meet the primary criteria of theories. Theory building researchers seem to agree that there are at least three requirements for theories, which a well-developed typology meets all of them: (i) forms or constructs must be created (ii) connections among these forms must be clearly illustrated (iii) the relationships must be capable of being tested by further empirical investigation or observation (Bacharach 1989; Doty and Glick 1994; Whetten 1989).

In doing so, the typology will first provides nine ideal types about the application of technologies for advancing services. It will also consider the impact of multidimensional constructs of value appropriation and value co-creation, which will be the building blocks used to describe ideal types. The ideal types and building blocks are key elements in theory building and providing theoretical contributions. Doty and Glick (1994) defines ideal types as compound constructs, which are the result of configurations between multi-dimensional building blocks. Second, we then suggest a set of dependent variables as well as technological case studies in order to justify the internal consistency among the building blocks resulting different ideal types. Third, the allocation of the technologies and the implicit predictions of service innovations and business model changes, which accompany each ideal type, are deductible and subject to disconfirmation. Further, the fact that different technologies may not be inclusive to particular types and can be allocated to different ideal types as a result of testing, highlights the “falsifiability” criteria for reflecting typologies as theories (Bacharach 1989; Doty and Glick 1994).

Data collection: This project will utilise case study research and the required interviews with the key informants in the UK retail sector (See Appendix A for list of topic and example questions). The data collection will include an initial exploratory phase including nine main case studies in the UK retail sectors as well as the interviews. During this phase the classification of technologies will be constantly updated to demonstrate the key features and value drivers of different groups of technologies. Using theoretical and polar sampling methodology, nine main case studies from the UK retail sector will be selected to demonstrate the key features and benefits of the implementation process of technologies in the UK retail sector. The case studies will be selected from a diverse and extreme range of samples from very high to shallow performing cases. The selection of the cases enables the observation of the internal and conflicting patterns for the implementation process of technologies in the UK retail sector.

Collected data will be observed and checked by the supervisory team (Prof Paul Trott and Dr Chris Simms) to make sure that the stories for each case study provide a clear understanding of the chosen technology and align with the research objectives. Further, the data will be enriched with industry & company reports and developmental memos, which are available to public. The length of the interviews, which will take place after the case study research through using secondary data, will be no longer than 30 minutes. Furthermore, the collected data will determine what other data need to be collected and how the interview questions can be adjusted and re-directed to enable creation of richer concepts.

10 Compliance With Codes, Guidance, Policies and Procedures

This research, considering that it involves human participants will be consistent with the Declaration of Helsinki and the UK Research Integrity Office Code of Practice for Research (UKRIO). The research will strictly adhere to Concordat to Support Research Integrity and to the

University of Portsmouth ethics policy. In doing so, the research is consistent with the two sources of guidance explained below:

- Declaration of Helsinki (Ethical Principles For General Research Involving Human Subjects)

Although the declaration of Helsinki was originally developed to provide guidance to physicians in medical research, the statement can be applied to any research involving human subjects. As such, the research will be consistent with the codes below adopted from the Declaration of Helsinki:

1. Considerations related to the well-being of the human subject will take precedence over the interests of science and society. (This research does not require consideration of the well being of the human subjects)
2. Research is subject to ethical standards that promote respect for all human beings and protect their rights. Special attention will be given to those who cannot give or refuse to participate at any stage during the interview process.
3. It is the duty of the researcher to protect the life, health, privacy, and dignity of the human subject. (The primary source of this research is case study and careful consideration of the privacy of the human subjects will take place)
4. Appropriate caution must be exercised in the conduct of research, which may affect the environment, and the welfare of animals. (The research does not affect the environment and the welfare of animals)
5. The design and performance of each experimental procedure involving human subjects should be clearly formulated.
6. The research protocol contains a statement of the ethical considerations involved and indicates that there is compliance with the principles enunciated in this Declaration.
7. The research project involving human subjects will be preceded by careful assessment of predictable risks. (This research delivers no risks for the human subjects since the nature of the work is mostly theoretical with case study research as the primary source of data collection)
8. The subjects must be volunteers and informed participants in the research project. (The case study research involves documents available to public. The Participants are free to withdraw from the study at any time)
9. The right of research subjects to safeguard their integrity must and will always be respected
10. In any research on human beings, each potential subject must be adequately informed of the aims, methods, sources of funding, any possible conflicts of interest, institutional affiliations of the researcher, the anticipated benefits and potential risks of the study and the discomfort it may entail. (The key objective of the research is to provide short stories through using case study research and documents available to public. Further, the participants involved in the interviews will be informed through using forms and letter attached in the Appendix B and C).
11. Both authors and publishers have ethical obligations. In publication of the results of research, the investigators are obliged to preserve the accuracy of the results. (The

results of the study will be published in a PhD thesis and available at the University library. The results from the study, even when published in academic journals will be generalised and rather abstract as this is the requirement under typological case study methodology for generating theory)

- The UK Research Integrity Office Code of Practice for Research (UKRIO) – the University has adopted this Code for disciplined research in different areas including business studies. The UKRIO provides a recommended checklist for the researchers. The researcher has followed this checklist to make sure the research in general and the data collection process in particular are consistent and follow the legal and ethical requirements. A pdf version of the checklist can be found in the Appendix D.

11. Recruitment of Participants

11.1 Who are the Research Population?

The research context for this research is the UK retail sector. This research will highlight the importance of using technologies in the UK retail sector. As a result, this research explores the practices, which happen between a retailer and a technology supplier in the UK retail sector, and will provide a typology of technology in the chosen context. The research will justify the typology using a diverse range of technologies in the above sector.

The research will be conducted using case studies through secondary data. In the case of needs and where the research has not reached the theoretical saturation point – the point that incremental learning is insignificant (Glaser and Strauss 1967) – interviews will be conducted with key informants including practitioners, market analyst, technology analyst, freelance advisors, and journalist in the UK retail sector. The key informants are knowledgeable with regards to the role of technologies in the chosen context. This also extends the limited empirical evidence on processes, which happen prior the final adoption or rejection of technology in the UK retail sector. The interviews will be mostly unstructured but will cover the story of the implementation process and motivations behind it. They also included actions taken related to the implementation, the relationship between the technology suppliers and their clients (primarily retailers), and the impact on the community. With the aims of the project to study a phenomenon that is dynamic and process in nature, the aim of this phase will be to study the processes and practices of the implementation of technologies in the UK retail sector and prior to the final adoption or rejection of the technology. These processes highlight how different technologies are considered based on their features and key benefits. The key result will be a general roadmap for the implementation process of technologies alongside a classification of technologies in the UK retail sector.

11.2 Inclusion/Exclusion Criteria

Inclusion Criteria: Participant has appropriate knowledge and involvement in firms that offer market research and provide marketing database for different industries including retail (marketing and sales directors, technology specialist, retail specialist, retail advisors).

Exclusion Criteria: No direct involvement in process / organisation that utilise / aim to utilise new

/model business model. Businesses outside of the UK retail market and service organisations.

11.3 Number of participants (include rationale for sample size)

The sample of participants will be 5-9 people with individual expertise and general knowledge of technologies in the UK retail sector. This is mainly due to the fact that the study deploys purposive sampling and will be complemented with theoretical sampling once the data collection started. Considering that the researcher needs to reach theoretical saturation as prescribed by the typological case study methodology the number of participants is not deemed relevant. However, the typology of the cases created in this research represents a three by three matrix with nine cells. Each cell shows a unique and classified group of technologies. Therefore, in total a maximum number of nine individuals will be interviewed. The individuals will be journalists and researchers with general expertise in the area of technologies within the UK retail sector. As explained before, the nature of the study is mainly theoretical and the key purpose of the interviews will be to validate the generalizability of the stories for each case study and the typology developed in this research. Having participants with general retail knowledge enables the researcher to improve the generalizability of the typology of case studies and provide richer data. Furthermore, using a small sample of participants with general knowledge of technologies reduces any unexpected risks to the organisations.

11.4 Recruitment Strategy (including details of any anticipated use of a gatekeeper in host organizations to arrange/distribute participant invitations)

Given the degree of importance of the interviews as a complementary source of data, very specific criteria for inclusion and the very nature of this project the individuals will be 'hand-picked' (purposive sampling) and then approached by the researcher. Researcher will identify the 'key' personnel and contact them directly via email or LinkedIn (See Appendix B for the template of the email that will be sent to these individuals). This information was gathered and collected from public domain using basic search engines, academic databases, industry press, social networks and researcher's personal connections within the industry.

Both published research and my own experience indicates that "cold calling" technology experts in the UK retail sector to request for participation in the research study is highly unlikely to be a successful recruitment technique. It is therefore aimed to expand the researcher's personal contacts with different technology experts in the UK. The initial contacts were achieved from participating in different workshops and retail exhibitions in the UK (e.g., Expo Retail Conference, Pro Retail Exhibition, NEC Internet Retailing, Retail Business Technology Expo etc.) starting from November 2016 to March 2018. Further, I will use the existing contacts from the Product Innovation Research Group and the supervisory team at the Faculty of Business and Law, using convenience sampling. Ideally these contacts would have had significant experience in doing research on different technology projects within the UK retail sector and across a diverse range of retailers and e-tailers.

11.5 Payments, rewards, reimbursements or compensation to participants

All participation is based on a voluntary basis and no payment to the participants will be provided.

11.6 What is the process for gaining *consent* from participants?

Full informed consent for the individuals in the research will be sought by getting written consent and prior notice from senior management of the technology firms for the researcher to be conducted. However, in most the cases, the participants will be individual business experts in area of research, who did not require written consent. As part of the ethical process it will be clarified with the supervisory team, their existing contact, and the researcher’s personal contacts if they have the authority to sign the additional approval form in the case of requirement. The research, its aims and the overall research process will be explained to the participants prior to starting the interview process and this will be either in person or over the phone. Consent form and Information for participants (Appendix B & C) will be sent to the participants prior to interviews. However, the summary of the research and the role of participants will be explained to the participants/companies during the initial contact (during the recruitment process - see Appendix B).

11.7 Has or will consent be gained from other organisations involved (if applicable)?

The researcher will firstly seek general consent from the organisation and this will be followed by obtaining consent from particular participants.

The consent form is attached in the Appendix B, C.

11.8 Arrangements for translation of any documentation into another language (if applicable)?

N/A

11.9 Outline how participants can withdraw (if applicable), and how data collected up to this point will be handled. Also stop criteria for specific tests (if applicable)?

On the request of the participant – all participants are free to withdraw from the study at any time and the data collected prior to withdrawal will not be used in the analysis at all. Any use of the data obtained from any individual who withdraws is against the ethical consideration adopted in this research and specific consideration will be given to make sure that the contributions made by those who withdraw will not be used at all. Researcher will use codes that will be attributed to the participants and this will only be available to the supervisors upon request (these are anonymous and therefore participants cannot be identified).

11.10 Outline details of re-consent or debrief (if applicable)?

N/A

12. Research Data Management

12.1 Description of data analysis

This research project deploys typological case study methodology and it will strictly adhere to its core principles. The collected data (case studies through using secondary data and interviews) will be transcribed and enriched by field notes. These will be uploaded to the Nvivo 11 Pro software. Using this software the line-by-line coding and constant comparison utilising memos and diagrams will be utilised – until reaching theoretical saturation.

12.2 Where and how will data be stored?

All data will be stored on the University password-protected virtual storage, which is password protected. Researcher only uses UoP issued computers and no data will be captured or stored on any other devices. However, a temporary storage of recordings on 'other' devices (e.g. voice recorder) will be necessary for transporting the recordings prior to the transcription. All individual participants will be given a specific code, which will be used in place of names to specify transcripts. Copies of consent forms giving both codes and identifying data will be stored in separate files on the password-protected virtual storage from all other data to facilitate the security of companies and individuals. The raw data will be made available only to research and PhD supervisors (Prof. Paul Trott; Dr. Christopher Simms) together with PhD examiners on request.

All transcribed material will be stored securely on the university password-protected virtual storage (notes will be disposed of immediately after transcription by secure disposal) and copied documents will be stored in locked filing cabinets. All data will be stored until publications (PhD thesis and academic publications including journal article, book chapters and conference presentations) are finalised and this will form part of the organisational and individual consent obtained from participants. Data will be safely disposed of ten years after being awarded degree.

12.3 Destruction, Retention and Reuse of Data

All data will be stored until publications (PhD thesis and academic publications including journal article, book chapters and conference presentations) are finalised and submitted completely. This will form part of the organisational and individual consent obtained from participants. Data will be safely disposed of ten years after being awarded the degree.

12.4 Personal Data – How will confidentiality be ensured (for instance will anonymisation be used)?

During transcription all data will be anonymised to remove reference to individual names. All individual participants will be given a specific code, which will be used in place of names, to identify transcripts. Copies of consent forms giving both codes and identifying data will be stored in separate files on the password-protected virtual storage from all other data to facilitate the security of companies and individuals. Care will be taken to preserve the anonymity of individual respondents by presenting only anonymised data (removing names and job titles).

12.5 How will organisational data (publically unavailable data) be handled (if applicable)?

Only organisational data that are publicly available will be used and these will be fully referenced.

12.6 How will security sensitive data be handled (if applicable)?

N/A

13. Publication / Impact / Dissemination Plans

The collected data will form the basis of researcher's PhD thesis. The data will also be used in production of academic papers / conferences and these will be Open Access (AO) to be eligible for

the next REF, HEFCE's. Furthermore, the researcher will upload the articles to Pure immediately after being accepted for publication.

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15. Appendices

Put N/A in version Number column if necessary		
Document	Date	Version No.
Application Form	14 November 2016	2
Invitation Letter	29 November 2016	3
Participant Information Sheet(s) (list if necessary)	14 November 2016	2
Consent Form(s) (list if necessary)	29 November 2016	3
Supervisor Email Confirming Application	14 November 2016	N/A
Interview Questions / Topic List	14 November 2016	1

16. Declaration by Principal Investigator and Supervisor (if applicable)

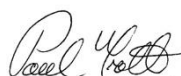
1. The information in this form is accurate to the best of my/our knowledge and belief and I/we take full responsibility for it.
2. I/we undertake to conduct the research in compliance with the University of Portsmouth Ethics Policy, UUK Concordat to Support Research Integrity, the UKRIO Code of Practice and any other guidance I/we have referred to in this application.
3. If the research is given a favourable opinion I/we undertake to adhere to the study protocol, the terms of the full application as approved and any conditions set out by the Ethics Committee in giving its favourable opinion.

4. I/we undertake to notify the Ethics Committee of substantial amendments to the protocol or the terms of the approved application, and to seek a favourable opinion before implementing the amendment.
5. I/we undertake to submit annual progress reports (if the study is of more than a year's duration) setting out the progress of the research, as required by the Ethics Committee.
6. I/we undertake to inform the Ethics Committee when the study is complete and provide a declaration accordingly.
7. I/we am/are aware of my/our responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data, including the need to register, when necessary, with the appropriate Data Protection Officer. I/we understand that I/we am/are not permitted to disclose identifiable data to third parties unless the disclosure has the consent of the data subject.
8. I/we undertake to comply with the University of Portsmouth Research Data Management Policy.
9. I /we understand that research records/data may be subject to inspection by internal and external bodies for audit purposes if required.
10. I/we understand that any personal data in this application will be held by the Ethics Committee, its Administrator and its operational managers and that this will be managed according to the principles established in the Data Protection Act 1998.
11. I understand that the information contained in this application, any supporting documentation and all correspondence with the Ethics Committee and its Administrator relating to the application:
 - Will be held by the Ethics Committee until at least 30 years after the end of the study
 - Will be subject to the provisions of the Freedom of Information Acts and may be disclosed in response to requests made under the Acts except where statutory exemptions apply.
 - May be sent by email or other electronic distribution to Ethics Committee members.

Principal Investigator: Amir Homayounfard

Date: 29 November 2016

Supervisor (if applicable): Professor Paul Trott
2016



Date: 29 November 2016

Appendix A - Interview Questions / Topics

The research project is of abductive nature and it utilise typological case study research through using secondary data. Furthermore, in the case of need, interviews with the key informants to provide a general image and improve the validity of the case study research will be conducted. Considering this constructivism approach the project rather the list of topic (including some example questions) instead of precise questions is included. Furthermore, the study deploys theoretical sampling that enables researcher to re-shape the research questions for the future interviews to get the best possible image of the phenomenon under the study.

AREA	Main Topics	Example of Open-Ended Questions
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Explore how retailers evaluate new technologies?	Explanation for the use of current business model	Can we start by giving me an example of a recent project you were involved in? Can you describe the implementation process from initial expression of interest to in-store application?
		How can technology suppliers benefit from the role of customers during the implementation stage?
		What about the idea of a technology-testing lab where consumers are invited in to test the product etc.?
Technological innovation/change	Attitude towards technologies	In your opinion, how do technology suppliers introduce a new technology to the retailers?
		How often/frequent is it that a firm would introduce a technology that completely surprises its competition? For instance, a retailer adopts a new point of sale technology and other retailers are completely surprised, how often does that happen?
Retail practices	Adoption or diffusion of innovation	How willing are retailers to adopt new service-based technologies?
		How willing are retailers to invest in the development of bespoke service based technologies? How do retailers engage with partners for adopting new technologies?
Retail strategy	Business model innovation	Do you think new technologies can result in changing a retailer's business model? If so, can you give an example?
		How do new technologies deliver value for the retailer? (Value as utility and profit for the firm)

Appendix B – Invitation Letter

Below is a draft of the letter that will be send to the organisations to participate in the research. Letter will be personalised and therefore several sections might change to tailor it better to the particular organisation.

Research Student: Amir Homayounfard
 Department of Strategy, Enterprise & Innovation
 Faculty of Business and Law, University of Portsmouth
 Room 3.09, Portland Building, Portland Street,
 Portsmouth, PO1 3AH.
 Tel: 07849031765
 Email: Amir.haman@port.ac.uk

First supervisor: Professor Paul Trott
 Department of Strategy, Enterprise and Innovation
 Faculty of Business and Law, University of Portsmouth
 Room 5.12, Richmond Building, Portland Street,
 Portsmouth, PO1 3DE.
 Tel: 02392844245
 Email: Paul.trott@port.ac.uk



Title of project: value creation and the implementation of technologies for advancing services: an investigation in the UK B2B retail sector

REC Ref No: (internal use only)

Dear <Potential Research Participant>

My name is Amir Homayounfard and I am a PhD student conducting research on the role of technologies for advancing services in the UK retail sector. My research provides an understanding about the implementation process of technologies, which takes place prior to the final adoption or rejection of the technology. Further, the research provides a general classification of the technologies in the UK retail sector in form of a typology of case studies.

I am interested in working with individual experts, who can offer better insight on the implementation process of technologies and different technologies create value. I am aiming to identify different processes and practices performed by the retailers and in collaboration with their technology suppliers prior to the final adoption of the technology in the UK retail sector.

I know that <individual/organization > is has extensive knowledge about different technologies in the UK retail sector and I would like to invite you to participate in this research study. For more information about why you have been chosen please see the attached Participant information Sheet.

My research will be undertaken in two phases. Firstly, I will be focusing on your general experiences and attitudes towards the implementation of technologies in the UK retail sector from case studies using secondary data and, in the case of needs, supplemented with interviews. Next, I will be exploring how the findings from the case studies and the interviews will result in adding value by technologies. In other words, I will be try to provide a classification of different groups of technologies in the retail sector.

All information provided to me as part of the study will be held securely. At the end of the study a short report will be provided to company management, but no individual data will be enclosed- participant names will not be used in any report. In the same way all data will be anonymised so that no reference to individual names in any academic publication.

Please contact me via email or telephone if you are interested in taking part in this research. Taking part in the research is voluntary so the company and any individual may withdraw consent at any point. Please feel free to contact me if you have any further questions.

Yours faithfully,

Amir Homayounfard

Appendix B.1. Participant's Information Sheet

Research Student: Amir Homayounfard
Department of Strategy, Enterprise & Innovation
Faculty of Business and Law, University of Portsmouth
Room 3.09, Portland Building, Portland Street,
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Tel: 07849031765
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First supervisor: Professor Paul Trott
Department of Strategy, Enterprise and Innovation
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Portsmouth, PO1 3DE.
Tel: 02392844245
Email: Paul.trott@port.ac.uk



Participant Information Sheet: Organisations

Title of project: value creation and the implementation of technologies for advancing services: an investigation in the UK B2B retail sector

REC Ref No: (internal use only)

I would like to invite your organisation to take part in my PhD research study. Joining the study is entirely up to you, before you decide I would like you to understand why the research is being carried out and what it would mean for you as a participant. I will go through this information sheet with you, to help you decide whether or not you would like to take part and answer any questions you may have. I would suggest this would take about 5 minutes. Please feel free to discuss this with colleagues and please contact me if there are any points that are not clear.

What is the purpose of this research?

Although the UK economy has been steadily recovering, the retail industry is struggling to keep pace with the growth as consumers choose to spend their money on leisure activities instead. Instead of relying on predictions for what might happen several years hence, the most effective way for the retailers to grow their businesses is to become more responsive and to adapt to the changes very quickly using technology. Many retailers in the UK are failing to grasp that what was once considered cutting-edge technology is not working anymore and has become the minimum they need to compete effectively in today's retail industry. Technology would create incredible growth and company value, first by digitizing the customer experience, and then by simplifying operations and matching customers' needs. Although in the UK retail sector technology suppliers are offering retailers a diverse range of technologies, many of the technologies will never become widely adopted or if they do, it takes a long time for the retailers to adopt the technologies. For instance, after more than two decades of the introduction of the self-service checkout systems, still many retailers in the UK have not adopted the technology.

Therefore with an aim to be awarded a PhD degree I am looking to understand the journey that technologies go through prior to the final adoption or rejection by the retailers in the UK. Providing a generic understanding about the assessment activities for different technologies prior to the adoption or rejection enables my research to develop short stories about different technologies. It also provides a basic understanding about the importance of different technologies to the retailers in the UK retail sector.

Why has my organisation been invited?

Your organisation meets our sampling requirements by being already involved in / seeking to get involved in providing knowledge about the implementation of technologies and their value drivers. Also, you are invited as an individual expert in retail, who can significantly contribute in answering my research questions. There will be a range of individual experts who have appropriate knowledge about the role of technology in retail as well.

Does my organisation have to take part?

This research is mostly based on individual expertise and general knowledge of technologies in retail by using case studies. The individuals are mostly selected from firms with the expertise in market research. Therefore, it is up to the organisation to decide whether to participate in the study. I will describe the study and go through this information sheet. If your organisation agrees to take part, I will ask you to sign a consent form on behalf of the company. I will then ask you to help me to identify and contact relevant people within the company to participate in the research study.

Participation in this research is purely voluntary and the individual participants may withdraw at any stage. Participants are under no obligation to participate and there will be no negative consequences if they withdraw. If you agree to take part, I will then ask you to sign the consent form, datedversion number

What will happen to the organisation and our staff if we take part?

I will ask the organisation to help me identify relevant staff and management to participate in the study. Individuals will be asked to take part in an individual interview to express their personal experience and views on this subject matter. A list of questions will be asked to the interviewees, and the questions might be changed slightly from one interview to another depending on the response of the interviewees. Since the interviews will be conducted to supplement the case study research, the process will take place only once.

Organisation consent form emphasise that the information collected might be shared with authorised people for academic purposes. Collected data (recorded interviews, copies of documents) will be transferred to a computer. Collected data will be summarized to computer, all computer files will be password-protected and notes immediately disposed of. The consent will also include that the information collected will be saved securely as it might be needed for future academic publications (PhD thesis, journal articles, book chapters, conference presentations). As soon as the research and publications are completed all data collected will be erased.

A short report of my results will be provided to the individual and the company. Neither your organisation nor any participants will be identified by name or job title in this report and none of the responses you provide will be reported in a form that can be used to identify you. The same rules will apply in my PhD thesis and any other academic publications, and additionally the name of the company and its brands will also be disguised.

What will the company and staff have to do?

If the company or the individual decides to accept this invitation and returns the signed consent form, I will contact you to arrange dates and times to visit relevant facilities to conduct the research.

Once individual participants have been identified and contacted, I will arrange a convenient time and place to meet with them for the interview, when I will ask questions relating to the subject matter. Each interview should take approximately 30 minutes.

What are the possible disadvantages and risks of taking part?

There are no significant risks of taking part in this research.

Staff involved in the research will be asked to commit a small amount of time to the research study (approximately 30 minutes per interview, plus additional time to help with gathering documents etc.). All interviews will be organised to minimise disruption to the work of participants.

The reputation of the company will be protected by ensuring the anonymity of the company, its brands and its staff in all publications. The organisation and its brands will only be identified by the company specific report. In all other reports and academic publications, the company and its brands will not be identified. The names and job titles of all participating individuals will not be given in academic publications or in any reports supplied to participating companies. All data collected will be held securely to ensure the confidentiality of the company and its staff.

What are the possible benefits of taking part?

The possible benefits of this research are that we will have a better understanding about the implementation process of technologies in retail. This process happens prior to the final adoption or rejection of the technology by the retailers. Furthermore, a key outcome of this research is to provide a classification of technologies in form of a typology. This general typology has the potential to be further tested as a new project while it provides a basic understanding about the value drivers for different types of technologies.

Will your taking part in the study be kept confidential?

While taking and storing notes and summaries all data will be anonymised to remove reference to individual and company names, products, and locations of food and drink business facilities. All companies and individual participants will be given a specific code, which will be used in place of names, to identify transcripts. Copies of consent forms giving both codes and identifying data will be stored in separate files on the password-protected virtual storage from all other data to facilitate the security of companies and individuals. Care will be taken to preserve the anonymity of individual respondents by presenting only anonymised data (removing names and job titles).

What will happen if you don't want to carry on with the study?

As a volunteer you can stop participating in the interviews at any time, without giving a reason if you do not wish to. If you do withdraw from the study after some data have been collected you will be asked if you are content for the data collected thus far to be retained and included in the study. If you prefer, the data collected can be destroyed and not included in the study. Once the research has been completed, and the data analysed, it will not be possible for you to withdraw your data from the study.

What will happen to the results of the research study?

The results of the study will be published in a PhD thesis and available at the University library. It is also hoped that the results will produce journal articles, book chapters and academic conference presentations, which again, will be available via the library electronic resources. You will not be identifiable from the results in any document. Once the research and the publications are completed all data collected will be deleted.

Who is organising and funding the study?

This research is a self-funded project as a part of the researcher's PhD studies at the University of Portsmouth.

Who has reviewed this study?

Research in the University is looked at by an independent group of people, called the Research Ethics Committee, to protect your interests. This study has been reviewed and given a favourable opinion by the Faculty of Business and Law Research Ethics Committee.

Further information and contact details

If you would like to know the further details of research in the University, please follow the following link to the University of Portsmouth research website;

<http://www.port.ac.uk/research/>

If you would like details on the research carried out in the Faculty of Business and Law, please follow the following link to the faculty's research website;

<http://www.port.ac.uk/departments/faculties/portsmouthbusinessschool/research/>

If you would like further information about this project, please contact the researcher;

Amir Homayounfard, **Tel:** 07849031765, **Email:** Amir.haman@port.ac.uk

Thank you for taking the time to read this document. Hopefully it has answered all of your questions, but if not please do not hesitate to get in touch. If you decide to participate in this research you will be given a copy of this information sheet to keep and you will be asked to sign a consent form.

Appendix B.2. Participant's Information Sheet

Participant Information Sheet: Individuals

Research Student: Amir Homayounfard
Department of Strategy, Enterprise & Innovation
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First supervisor: Professor Paul Trott
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Tel: 02392844245
Email: Paul.trott@port.ac.uk



Ethics Committee Reference Number: E477, Ethics PBS

Invitation

Title of project: value creation and the implementation of technologies for advancing services: an investigation in the UK B2B retail sector

I would like to invite you to take part in my PhD research study. Joining the study is entirely up to you, before you decide I would like you to understand why the research is being carried out and what it would mean for you as a participant. I will go through this information sheet with you, to help you decide whether or not you would like to take part and answer any questions you may have. I would suggest this would take about 10 minutes. Please feel free to discuss this with colleagues and please contact me if there are any points that are not clear.

I am a PhD student at the Department of Strategy, Enterprise and Innovation at the Faculty of Business and Law. I am undertaking a research about understanding the importance of technology in the UK retail sector. I have provided a short summary and the required information about my research below.

Study Summary

This study is concerned with understanding the critical role of technology for the retailers in the UK retail sector. It is important because technology would create incredible growth and company value for the retailers, first by digitizing the customer experience, and then by simplifying operations and matching customers' needs. The nature of the research is theoretical with the key aim to understand the journey that technologies go through prior to the final adoption or rejection by the retailers in the UK. Providing a generic understanding about the assessment activities for different technologies prior to the adoption or rejection enables my research to develop short stories about different technologies. It also provides a basic understanding about the importance of different technologies to the retailers in the UK retail sector.

Therefore, I am seeking participants who have the individual expertise and general knowledge of technologies in the UK retail sector. As stated before, the central nature of the research is theoretical with the primary source of data collection as case study research. In order to validate the result of the case study research, the research is seeking participants with the expertise as stated above. Participation in the research would require you to attend an interview via Skype or a phone call depending on your preference. The interview will take approximately 30

minutes of your time. I believe your knowledge and expertise can provide a good fit according to the selection criteria below:

Inclusion Criteria: Participant should have appropriate knowledge and involvement in firms that offer market research and provide marketing database for different industries including retail (marketing and sales directors, technology specialist, retail specialist, retail advisors, technology researchers).

Exclusion Criteria: No direct involvement in process / organisation that utilise / aim to utilise new /model business model. Businesses outside of the UK retail market and service organisations.

Due to the nature of the research and the requirements of the data collection, the proposed activities do not require the researcher to undertake any travel that is inside or outside of the United Kingdom. As such, the interviewees will be contacted via email and there is no other means of approaching you. The interview process will happen via phone call or Skype. This provides ease of access and flexibility for both the researcher and the interviewees.

What is the purpose of the study?

Although the UK economy has been steadily recovering, the retail industry is struggling to keep pace with the growth as consumers choose to spend their money on leisure activities instead. Instead of relying on predictions for what might happen several years hence, the most effective way for the retailers to grow their businesses is to become more responsive and to adapt to the changes very quickly using technology. Many retailers in the UK are failing to grasp that what was once considered cutting-edge technology is not working anymore and has become the minimum they need to compete effectively in today's retail industry. Although in the UK retail sector technology suppliers are offering retailers a diverse range of technologies, many of the technologies will never become widely adopted or if they do, it takes a long time for the retailers to adopt the technologies. For instance, after more than two decades of the introduction of the self-service checkout systems, still many retailers in the UK have not adopted the technology.

Therefore, as explained above, there remains a clear need for understanding the critical role of technology in the UK retail sector. The nature of the study is theoretical with case studies as the primary source of data collection. The research aims to provide different short stories about different technologies in retail and how the retailers evaluate the technologies prior to their adoption or rejection. The main purpose of the semi-structured interviews through answering a few questions will be to validate the generalizability of the stories for each case study and the typology developed in this research.

Why have I been invited?

The initial contact was achieved from participating the retail workshop/exhibition dated ... in Expo Retail Conference/Pro Retail Exhibition/NEC Internet Retailing/Retail Business Technology Expo. You were presenting a seminar on the growing importance of different types of technologies e.g., mobile apps, online payment systems, security systems, backstage machinery, self-service checkout machines etc. Through the end of the seminar I approached you for a little chat while explaining my research. After you showed initial interest in the general objectives of my research, we exchanged contact details (business cards) for further contacts. As I have explained during the exhibition, the research involves case study data collection. It also provides a three by three matrix of different types of technologies in the UK retail sector. I am looking for participants with individual knowledge and expertise about technologies in the UK retail sector. I am seeking your personal view as an individual with particular expertise within the areas of technologies in retail. As an outcome of my research I have developed a three by three matrix as explained above in form of a typology and I would like to know your perspective about its generalizability. A total of 5-10 participants will be involved to provide a general perspective about the typology and the case study stories developed in my research.

Do I have to take part?

No, taking part in this research is entirely voluntary. It is up to you to decide if you want to volunteer for the study. I have described the key purposes of the study above and I would be more than happy to provide further explanation if you need. If you agree to take part, I will then ask you to sign the attached consent form, dated on the day of the interview, version number, 2.

What will happen to me if I take part?

The participants will be asked to take part in an individual interview to express their personal experience and views on this subject matter. The interview will be semi-structured and will last for approximately 30 minutes. A list of questions will be asked from the interviewee with their ability to talk freely regarding a desired subject or a personal experience. Due to the semi-structured nature of the interviews, the questions might be changed slightly from one interview to another depending on the response of the interviewees. Since the interviews will be conducted to supplement the case study research, the process will take place only once.

The participants will be asked if they are happy with the interview to be recorded. If not, the researcher will take notes about the key points considering the participant's permission. Collected data (recorded interviews, copies of documents) will be transferred to a secure computer. Collected data will be summarized to the computer, all computer files will be password-protected and notes immediately disposed of. The consent will also include that the information collected will be saved securely as it might be needed for future academic publications (PhD thesis, journal articles, book chapters, conference presentations). As soon as the research and publications are completed all data collected will be erased.

A short report of my results will be provided to the individual. No participants will be identified by name or job title in this report and none of the responses you provide will be reported in a form that can be used to identify you. The same rules will apply in my PhD thesis and any other academic publications, and additionally the name of the company and its brands will also be disguised.

Expenses and payments

The participants' involvement will be based on their interest and desire to contribute to the research. If they find the topic of exploring the importance of technologies in the UK retail sector interesting, they will participate in the interviews. The participants will not get paid for their time or any burdens associated with the research.

Anything else I will have to do?

The research requires no restrictions to be placed on participants. Although it is not necessary, in order to save time for both the research and the participant, a copy of the questions prior to the interview will be sent to the participants to familiarize themselves with the questions. This instruction is optional and can be avoided in case the participant does not think it is necessary to do so.

What data will be collected and / or measurements taken?

Due to the semi-structured nature of the interviews, the collected data includes the participant's answers to the interview questions and any particular subject that he/she feels is relevant to the story of a chosen case study or the matrix of technologies in the UK retail sector. As stated before, the interview will take place via Skype or phone call, based on the participant's preference. The participants will be asked if they are happy with the interview to be recorded. If not, the researcher will take notes about the key points considering the participant's permission. Aside from the voice recorder, there is no specialised equipment to be used during the interview. The interviews require no safety implications and there is no risk to the participants involved. Further, since the research aims to provide generic short stories about different technologies in the UK retail sector and validate the generalizability of the matrix developed in the research, no personal or sensitive data will be collected. This study does not reveal incidental findings, which might have significance for the health or wellbeing of the participants in any forms.

What are the possible disadvantages, burdens and risks of taking part?

There are no significant risks of taking part in this research due to the theoretical nature of the study and providing general stories in forms of case studies for different types of technologies.

Participants involved in the research will be asked to commit a small amount of time to the research study (approximately 30 minutes per interview). All interviews will be organised to minimise disruption to the work of participants.

The reputation of the participants will be protected by ensuring the anonymity of the individual and their reputation in all publication. The names and job titles of all participating individuals will not be given in academic publications or in any reports supplied to participating companies. All data collected will be held securely to ensure the confidentiality of the company and its staff.

What are the possible advantages or benefits of taking part?

While there will be no direct benefit to the individuals, the possible benefits of this research is to deliver a better understanding about the importance of technologies in the UK retail sector. This process happens prior to the final adoption or rejection of the technology by the retailers. Short case studies provided in this research will offer insights about the assessment activities that happen for the technologies. Furthermore, a key outcome of this research is to provide a classification of technologies in form of a typology. This general typology has the potential to be further tested as a new project while it provides a basic understanding about the value drivers for different types of technologies.

Will my taking part in the study be kept confidential?

While taking and storing notes and summaries all data will be fully anonymised to remove reference to individual and company names, products, and locations of food and drink business facilities. All individual participants will be given a specific code, which will be used in place of names, to identify transcripts. As the participants will not provide sensitive data, the anonymity will ensure that the participant cannot be identified using a combination of the available data. Copies of consent forms giving both codes and identifying data will be on the password-protected virtual storage and in separate files from all other data to facilitate the security of the individuals. Care

will be taken to preserve the anonymity of individual respondents by presenting only anonymised data (removing names and job titles). There will be no limitation regarding confidentiality.

Furthermore, in order to safeguard the participant's confidentiality during and after the study:

1. The data will be collected via Skype or phone calls and audio recording or notes will be based on participant's permission.
2. The data will be on the password-protected virtual storage and in separate files from all other data to facilitate the security of the individuals
3. The data will only be used to improve the general content of the short stories for each technology and validate the generalizability of the matrix of technologies in the UK retail sector.
4. The data, when made anonymous, may be presented to others at academic conferences, or published as a project report, academic dissertation or in academic journals or book.
5. The raw data, which would identify you, will not be passed to anyone outside the study team without your express written permission.
6. The raw data will be retained for up to 10 years. When it is no longer required, the data will be disposed of securely (*e.g.* electronic media and paper records / images) destroyed.

What will happen if I don't want to carry on with the study?

As a volunteer you can stop participating in the interviews at any time, without giving a reason if you do not wish to. If you do withdraw from the study after some data have been collected you will be asked if you are content for the data collected this far to be retained and included in the study. If you prefer, the data collected can be destroyed and not included in the study. Once the research has been completed, and the data analysed, it will not be possible for you to withdraw your data from the study.

What if there is a problem?

If you have a query, concern or complaint about any aspect of this study, in the first instance you should contact me (Amir Homayounfard, the PhD student) if appropriate. There will also be an academic member of staff listed as the supervisor whom you can contact (Professor Paul Trott). The contact details for both the researcher and the supervisor are included in this form.

If the complaint remains unresolved, please contact:

The University Complaints Officer regarding the above research project taking place in the Department of Strategy, Enterprise and Innovation at the Faculty of Business and Law.
023 9284 3642 complaints@port.ac.uk

Who is funding the research?

This research is being funded by the PhD student, Amir Homayounfard (this is a self-funded research). None of the researchers or study staff will receive any financial reward by conducting this study.

Who has reviewed the study?

Research involving human participants is reviewed by an ethics committee at the University of Portsmouth to ensure that the dignity and well-being of participants is respected. This study has been reviewed by the Faculty Ethics Committee at the Faculty of Business and Law and been given favourable ethical opinion.

Thank you

Thank you for taking time to read this information sheet and for considering volunteering for this research. If you do agree to participate your consent will be sought; please see the accompanying consent form. You will then be given a copy of this information sheet and your signed consent form, to keep.

Appendix C – Consent Form

Research Student: Amir Homayounfard
Department of Strategy, Enterprise & Innovation
Faculty of Business and Law, University of Portsmouth
Room 3.09, Portland Building, Portland Street,
Portsmouth, PO1 3AH.



Tel: 07849031765
Email: Amir.haman@port.ac.uk

First supervisor: Professor Paul Trott
Department of Strategy, Enterprise and Innovation
Faculty of Business and Law, University of Portsmouth
Room 5.12, Richmond Building, Portland Street,
Portsmouth, PO1 3DE.
Tel: 02392844245
Email: Paul.trott@port.ac.uk

Consent Form

Title of project: value creation and the implementation of technologies for advancing service: an investigation in the UK B2B retail sector

REC Ref No:

Please tick the

box

I confirm that I have read and understood the information sheet dated xx/xx/2017 for the above study. I have had opportunity to consider the information, ask questions and have these answered satisfactorily.

I understand my participation is voluntary and that I am free to withdraw at any time without giving any reason, up to the point where the data is being analysed.

I agree to my interview being audio recorded. This is anonymised (e.g. Participant 1 said " ")

I agree that the information collected during the study can be shared with authorised people for academic purposes.

I agree to the data I contribute being stored securely, until all academic publications (PhD thesis, journal articles, book chapters and conference presentations) have been completed.

I agree to take part in the above study.

Name of Organisation / Participant:

Signature: **Date:**

Name of person taking consent:

Signature: **Date:**

(When completed, one copy to be retained by participant; 1 copy for researcher's file)

Appendix D – Recommended checklist for the researchers according to the UKRIO

Recommended checklist for researchers

The Checklist lists the key points of good practice in research for a research project and is applicable to all subject areas. More detailed guidance can be found in section 3. A PDF version is available from www.ukrio.org

Before conducting your research, and bearing in mind that, subject to legal and ethical requirements, roles and contributions may change during the time span of the research:

- 1 Does the proposed research address pertinent question(s) and is it designed either to add to existing knowledge about the subject in question or to develop methods for research into it?
- 2 Is your research design appropriate for the question(s) being asked?
- 3 Will you have access to all necessary skills and resources to conduct the research?
- 4 Have you conducted a risk assessment to determine:
 - a whether there are any ethical issues and whether ethics review is required;
 - b the potential for risks to the organisation, the research, or the health, safety and well-being of researchers and research participants; and
 - c what legal requirements govern the research?
- 5 Will your research comply with all legal and ethical requirements and other applicable guidelines, including those from other organisations and/or countries if relevant?
- 6 Will your research comply with all requirements of legislation and good practice relating to health and safety?
- 7 Has your research undergone any necessary ethics review (see 4(a) above), especially if it involves animals, human participants, human material or personal data?
- 8 Will your research comply with any monitoring and audit requirements?
- 9 Are you in compliance with any contracts and financial guidelines relating to the project?
- 10 Have you reached an agreement relating to intellectual property, publication and authorship?
- 11 Have you reached an agreement relating to collaborative working, if applicable?
- 12 Have you agreed the roles of researchers and responsibilities for management and supervision?
- 13 Have all conflicts of interest relating to your research been identified, declared and addressed?
- 14 Are you aware of the guidance from all applicable organisations on misconduct in research?



N/A

Two statement of cod have been followed



N/A

N/A

N/A

N/A



When conducting your research:

- 1 Are you following the agreed research design for the project?
- 2 Have any changes to the agreed research design been reviewed and approved if applicable?
- 3 Are you following best practice for the collection, storage and management of data?
- 4 Are agreed roles and responsibilities for management and supervision being fulfilled?
- 5 Is your research complying with any monitoring and audit requirements?



N/A



N/A

When finishing your research:

- 1 Will your research and its findings be reported accurately, honestly and within a reasonable time frame?
- 2 Will all contributions to the research be acknowledged?
- 3 Are agreements relating to intellectual property, publication and authorship being complied with?
- 4 Will research data be retained in a secure and accessible form and for the required duration?
- 5 Will your research comply with all legal, ethical and contractual requirements?



N/A



FORM UPR16

Research Ethics Review Checklist



Please include this completed form as an appendix to your thesis (see the Postgraduate Research Student Handbook for more information)

Postgraduate Research Student (PGRS) Information		Student ID:	715019
PGRS Name:	Amir Homayounfard		
Department:	Strategy, Enterprise and Innovation	First Supervisor:	Professor Paul Trott
Start Date: (or progression date for Prof Doc students)	October 2013		
Study Mode and Route:	Part-time <input type="checkbox"/>	MPhil <input type="checkbox"/>	MD <input type="checkbox"/>
	Full-time <input checked="" type="checkbox"/>	PhD <input checked="" type="checkbox"/>	Professional Doctorate <input type="checkbox"/>
Title of Thesis:	Value creation and the evaluation of technologies for advancing services: An investigation in the UK B2B retail sector		
Thesis Word Count: (excluding ancillary data)	66,458		

If you are unsure about any of the following, please contact the local representative on your Faculty Ethics Committee for advice. Please note that it is your responsibility to follow the University's Ethics Policy and any relevant University, academic or professional guidelines in the conduct of your study

Although the Ethics Committee may have given your study a favourable opinion, the final responsibility for the ethical conduct of this work lies with the researcher(s).

UKRIO Finished Research Checklist:

(If you would like to know more about the checklist, please see your Faculty or Departmental Ethics Committee rep or see the online version of the full checklist at: <http://www.ukrio.org/what-we-do/code-of-practice-for-research/>)

a) Have all of your research and findings been reported accurately, honestly and within a reasonable time frame?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
b) Have all contributions to knowledge been acknowledged?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
c) Have you complied with all agreements relating to intellectual property, publication and authorship?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
d) Has your research data been retained in a secure and accessible form and will it remain so for the required duration?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
e) Does your research comply with all legal, ethical, and contractual requirements?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>

Candidate Statement:

I have considered the ethical dimensions of the above named research project, and have successfully obtained the necessary ethical approval(s)

Ethical review number(s) from Faculty Ethics Committee (or from NRES/SCREC):		E477
If you have <i>not</i> submitted your work for ethical review, and/or you have answered 'No' to one or more of questions a) to e), please explain below why this is so:		
<div style="background-color: #cccccc; height: 20px; width: 100%;"></div>		
Signed (PGRS):	<div style="background-color: #add8e6; width: 50px; height: 30px;"></div>	Date: <div style="background-color: #cccccc; width: 50px; height: 15px;"></div>

UPR16 – August 2015