UNIVERSITY OF Hull

Value co-creation intention, practices and experience in self-service technologies

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Abstract

The 21st century is known as the experience economy where the prime aim of businesses is to provide superior customer experiences, mainly through actively seeking mutually beneficial interactions with customers which is often labelled as 'value co-creation'. Co-creation indicates a collaborative perspective of value creation and changes the roles of the organisation into 'value facilitators', and customers' from passive to active as 'co-creators'. Extant research suggests that businesses which acknowledge this new collective practice achieve greater organisational performance. However, success is not always guaranteed in co-creation; it is an ever-present possibility that a sub optimal implementation may result in value 'co-destruction' which causes to diminish wellbeing of the participants.

Advances in technologies have presented many opportunities for both organisations and customers to access a multitude of technological interfaces, prompting organisations to explore how self-service technologies (SSTs) can be effectively used in value creation. Despite these advances in SSTs, scholarly work in value co-creation context is largely limited to exploring interpersonal interactions in traditional physical interfaces. To the best of the researcher's understanding, no studies examine how customers co-create value (value co-creation practices) in SSTs. An inquiry as to whether customers would like to co-create value in SSTs (co-creation intention), what customers do while co-creating value (value co-creation practices) and how they experience their collaboration (co-creation experience) in SST is therefore important.

Mixed methodology is adopted, based on the sequential exploratory strategy, where a qualitative study is followed by a quantitative study, such that the findings of the qualitative study are instrumental in designing the quantitative study. The 'practice theory' is used as the theoretical foundation in understanding customer value co-creation practices and 'total customer experience' is used in understanding customer co-creation experiences.

The qualitative study explores eight determinants of co-creation intention and sixteen customer value co-creation practices which are re-classified into five groups of practices (5Cs): co-learning, co-producing, co-operating, connecting and correcting. There is also evidence on the duality of these practices resulting in co-creation and co-destruction, and interconnectivity among practices.

Following a confirmatory approach in the quantitative phase, a high level of customer value co-creation intention in SSTs is recognised. 'Technology know-how' is found to be the strongest predictor of co-creation intention while performance, information richness and situational factors show significant direct effects. 'Convenience' is significant with the moderating effect of age, such that the effect is stronger for young people and 'social influence' is significant with the moderating effect of gender with a negative effect on males and a positive effect on females. Customer value co-creation intention shows a strong significant positive effect on co-creation practices and weak significant negative effect on value co-destruction. 'Past experience' displays a significant positive effect on co-creation practices and significant negative effect on co-destruction. Customer value co-creation practices show a significant positive effect on customers' functional and emotional experiences, while co-destruction reveals a negative effect on emotional experiences, and surprisingly a positive effect on functional experiences. Finally, a significant positive effect of functional experiences is found on emotional experiences.

This study adds new knowledge to marketing theory by revealing customer value co-creation practices in SSTs for the first time. It also makes some incremental contributions enriching the literature in the well-established fields of value co-creation, self-service technology and customer experience. Finally, the study develops a comprehensive conceptual model expounding co-creation intention, practices and experiences in self-service technologies, which can be extended to any technologically supported services, providing an element of scientific utility in the study. This understanding will benefit service providers in devising value enhancing self-service technological interfaces from both strategic and operational perspectives by ensuring superior customer experiences and ultimately accomplishing competitive advantages.

Dedication

To my husband, Pubudu, for teaching me the greatest lesson on stress management, leaving me alone in the final year of my PhD.

To my lovely daughter, Minuri, for encouraging me to complete my studies with the fullest effort with her hidden agenda of acheiving family togetherness.

To my little son Tharuk, for making the home a naughty factory.

I thank you all for your precious roles in this journey.

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Publications associated with the thesis

1. Working on a journal article on '5Cs in customer value co-creation in self service technologies'.

2. Galdolage B.S, Jayawardhena C, Rathnayake N (2018), Modelling customer value co-creation practices and experiences in self-service technologies, accepted to present in first global conference on creating value, DE Montfort University, United Kingdom, (23-24 May).

3. Galdolage B.S, Jayawardhena C, Rathnayake N (2017), Customer value co-creation practices in self-service technologies: A practice theory based approach, Academy of Marketing Research Conference, United Kingdom.

4. Galdolage B.S, Jayawardhena C, Rathnayake N (2017), Factors affecting customer acceptance of self-service technologies in service transactions: A qualitative inquiry, Academy of Marketing Research Conference, United Kingdom.

5. Galdolage B.S, Jayawardhena C, Rathnayake N (2017), Value co-creation and customer experience in self-service technologies: Adoption, roles, learning and practices, Academy of Marketing Research Conference, United Kingdom.

6. Galdolage B.S, Jayawardhena C, (2016), Value Co-Creation and Optimizing Total Customer Experience: Towards a Conceptual Model in Self-Service Technologies, Frontiers in service research conference, Bergen, Norway.

7. Galdolage B.S, Jayawardhena C, Rathnayake N (2016), Conceptualization of value co-creation and total customer experience in self-service technologies, Academy of Marketing Consumer Research SIG, Loughborough University, United Kingdom.

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List of abbreviations

SSTs	Self-Service Technologies
S-D Logic	Service-Dominant Logic
G-D Logic	Goods-Dominant Logic
TCE	Total Customer Experience
UK	United Kingdom
SEM	Structural Equation Modeling
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
MAR	Missing at Random
MCAR	Missing Completely at Random
NMAR	Not Missing at Random
DF	Degree of Freedom
CR	Critical Ratio
MLE	Maximum Likelihood Estimation
SE	Standard Errors
SMC	Squared Multiple Correlations
VIF	Variance Inflation Factor
AVE	Average Variance Extracted
CR	Construct Reliability
GOF	Goodness of Fit index
RMSEA	Root Mean Square Error of Approximation
RMR	Mean Square Residual
SRMR	Standardised Root Mean Residual
NFI	Normed Fit Index
TLI	Tucker Lewis Index
CFI	Comparative Fit Index
MI	Modification indices
KMO	Kaiser-Meyer-Olkin measure
CLF	Common Latent Factor
CMB	Common Method Bias

CHAPTER ONE

INTRODUCTION

CHAPTER ONE

INTRODUCTION

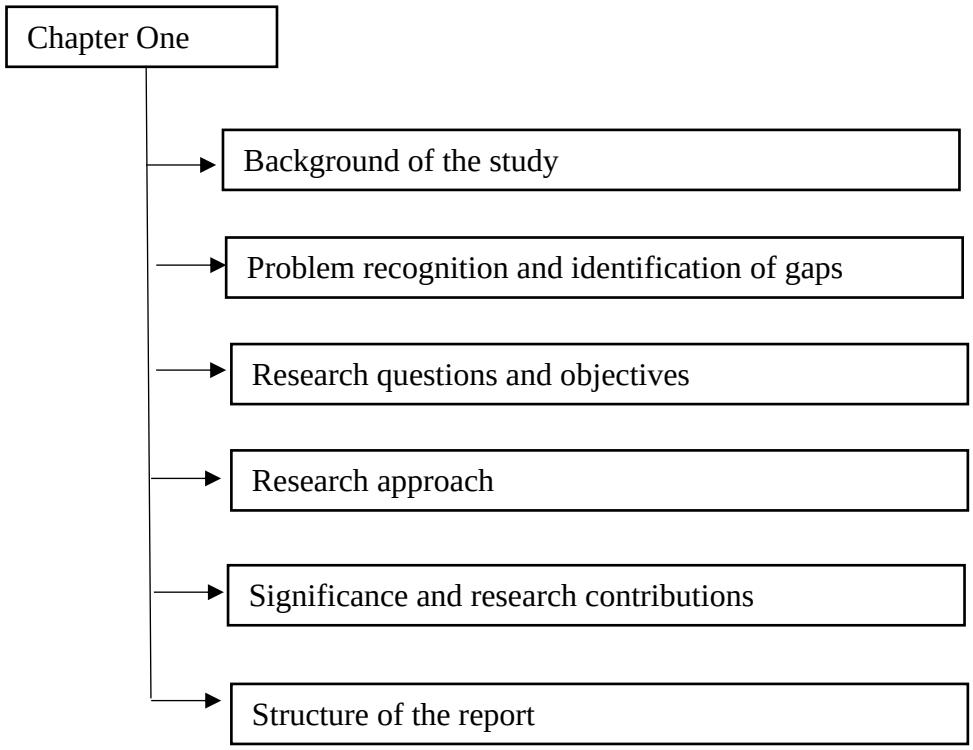
Overview

This study investigates the sequential effects of customer value co-creation ‘intention’, ‘practices’ and ‘experience’ in Self-Service Technologies (SSTs).

The first chapter of the report is devoted to the introduction of the study, expounding the background of the study, problem recognition and identification of research gaps, the research objectives, research approach, significance and contributions and finally the structure of the report.

The following figure illustrates the structure of Chapter One.

Figure 1. 1: Structure of Chapter One



1.1 Background of the study

Economies have gone through many evolutions throughout the centuries reaching to the era of experience in the 21st century, where the trend in marketing focuses on providing long-lasting and memorable customer experiences (Pine & Gilmore, 1999). Given the competition in contemporary business, organisations are exploring new and better means of differentiating their service offerings from those of competitors, to deliver great customer experience. Therefore, providing an excellent customer experience can be viewed as a prominent marketing strategy and as a new lever to create value for both the company and the customer (Carù & Cova, 2003). Consequently, business organisations are seeking new opportunities to provide superior customer experiences through understanding the process of customer value creation and realization (Akaka et al., 2015) and effectively providing opportunities for customers to join with the organisation in creating highly customized service, which is acknowledged in the concept of 'value co-creation' (Prahalad & Ramaswamy, 2004a; Vargo & Lusch, 2008a; b; Vargo et al., 2008).

Simply put, active customer participation in value creating process is acknowledged as value co-creation. This alters the traditional goods-centred thinking of marketing, which is limited to perceiving products as created in the factory (Deshpande, 1983), embedding value and delivered to the customer through the exchange (Vargo & Lusch, 2004), keeping the customer at the end of the value creation process as a passive value receiver (Vargo & Lusch, 2004). The traditional role performed by the organisation as the sole provider of value has not been equally accepted in modern service-centred marketing; instead, collaborative value creation is receiving an increased attention (Vargo & Lusch, 2004). Now, organisations are no longer agents who produce a ready-made value to the customer. Instead, they offer resources (Grönroos & Ravald, 2009) to help customers to create value with use (value-in-use) (Grönroos & Ravald, 2011) in their domain (Grönroos, 2006), transferring to the customer the central role in value co-creation (Aarikka-Stenroos & Jaakkola, 2012). Therefore, now organisations work as 'value facilitators' (Vargo et al., 2008) providing 'value propositions' (Payne et al., 2008) for customers to integrate through co-creation. 'Resource integration' has been identified as the central practice in value co-creation, and two forms of resources have been identified as 'Operant resources' (skills and knowledge) and 'Operand resources' (physical resources on which operations are executed) (Vargo & Lusch, 2004; Lusch & Vargo, 2006b; Vargo et al., 2008). Co-creation is inherent in service businesses (Galvagno &

Dalli, 2014) and acknowledged as a management initiative which allows collaborative work in producing collectively valued outcomes (Prahalad & Ramaswamy, 2004a), which diminishes the gap between the service firm with its customers (Rose et al., 2011). Customer value co-creation is identified as a dynamic, interactive and non-linear processes (Payne et al., 2008), multidimensional in nature (Yi & Gong, 2013) and difficult to figure out (Chan et al., 2010).

Although value has been identified as largely associated with co-creation (Vargo & Lusch, 2004) that mainly presents positive outcomes (Laamanen & Skalen, 2014), success is not always guaranteed in co-creation (Ple & Cáceres, 2010:431). Echeverri & Skålén (2011) note that value co-destruction results in diminishing 'value in use', while Laamanen & Skalen (2014:12) view destruction from a conflictual perspective arguing that "any conflict would relate to the perceived and experienced value, that is, the (non)fulfilment of the provider's value proposition in customers' value-in-use". The history of value co-creation research has however been criticised for being over optimistic, neglecting value co-destruction (Ple & Cáceres, 2010).

Conventionally, co-creation takes place within physical boundaries with direct dyadic interactions between the customer and the service provider. However, advanced technologies coupled with increased labour cost, invisibly influenced organisations to provide opportunities for customers to interact with the organisation's service provisions at their fingertips, presenting a vast range of opportunities for both organisations and customers. This process practically encourages organisations to explore how self-service technologies (SSTs) can be effectively used in value creation with customer collaboration (Liljander et al., 2006; Hilton et al., 2013). Co-creation with technologies is acknowledged by Lusch et al. (2007:9) as "when a person uses an appliance, it is essentially collaborating with the producer of that good and using the knowledge of that producer", and using such technologies reduces waste (time or effort) in the value-creation process. The 'service eco system perspective' outlines resource integration as the central mechanism of connecting people and technology (Akaka et al., 2012:207) while the 'full institutional perspective' of service-dominant logic (S-D logic) (Vargo & Lusch, 2016) explains how value co-creation takes place through different institutional arrangements such as the provision of advanced technologies.

Value co-creation in SSTs happens through 'resource integration', and SSTs are recognised as an operand resource (Barnes et al., 2009; Payne et al., 2009) which is

embedded with operant resources such as explicit knowledge and interactivity (Hughes et al., 2011). Customers become partial employees (Meuter & Bitner, 1998) by producing their service with little or no support from organisational employees (Bitner et al., 1997) converting their role from passive to more active (Hilton et al., 2013). Although only routine and simple transactions were initially in the norm of SSTs, customers are now expected to perform more complex and non-routine service transactions (Quinn et al., 1990). Technology based services are becoming points of distinction in the marketplace (Verhoef et al., 2009) and increasing numbers of customers are working with technologies to perform their service transactions instead of depending on the organisation's employees (Meuter et al., 2000).

Despite these advances in SSTs, scholarly work in the value co-creation context is largely limited to traditional physical interfaces (Hilton et al., 2013) and there is a paucity of extant research on technological interfaces as a medium of co-creation (Liljander et al., 2006). To the best of the researcher's understanding, no research work has studied how customers co-create value (value co-creation practices) when services are provided via technological interfaces (SSTs). Therefore, an inquiry as to what customers do while co-creating value (value co-creation practices) with self-service technologies is worth pursuing.

Carù & Cova (2015) suggest that the focus on practices is one of the better ways to understand the co-creation and equally, Neghina et al. (2015) acknowledge that understanding the actions of actors using the practice theory is a good starting point. This is because social practice theories are commonly used in enriching the comprehension of 'what people do' (Schatzki et al., 2001) and are particularly suitable for illustrating changes that occur within practices over time, brought about by technological innovations (Spotswood et al., 2015).

Even though providing superior customer experience is the priority in the 'experience economy', many businesses fail to meet customer experience expectations in respect of value creation (Meyer & Schwager, 2007). Previous research work has shown that when organisations provide value co-creation opportunities without an adequate understanding of consumers' expectations and their reaction patterns, it could limit the success of the value creation process and result in poor customer experiences (Ple & Cáceres, 2010).

Given the above, this study identifies the importance of studying customer value co-creation through technological interfaces. As scholarly work on value co-creation at technological interfaces is relatively low, it is worth exploring customer intention of collaborating with technologies as a prerequisites. However, rather than being limited to understanding co-creation, it is recognised as essential to consider the possible failures of the value co-creation process, which is termed as 'value co-destruction'. Further, recognising how value co-creation effects customer experience is also worthy of examination to aid in achieving the ambitious targets of business organisations in this experience economy.

Against this backdrop, this study investigates customer value co-creation intention, practices (both co-creation and co-destruction) and experiences in self-service technologies.

1.2 Problem recognition and identification of gaps

The available literature in both value co-creation and customer experience study areas contains deficiencies which demand the attention of scholars. These unfilled gaps, which are addressed in this study, are discussed briefly in the following sub sections and discussed in detail in the chapter two (literature review).

1.2.1 Gaps in the value co-creation literature

Among the weaknesses in the history of value co-creation literature, this study recognises four main gaps as crucial and in need of immediate attention.

First, the majority of the past studies on value co-creation were identified as firm centric and represented the organisation viewpoint or provider-customer interactions (Heinonen et al., 2010), rather than understanding the customers' view of co-creation (Payne et al., 2008; Tynan et al., 2010). The 'Service Dominant Logic' on which many co-creation studies were based, was identified as "very production and interaction-focused, i.e. service provider-dominant than focusing on customer" (Heinonen et al., 2010). A few empirical studies have been addressed the customers' view and their contribution in value co-creation (McColl-Kennedy et al., 2009), and therefore, the customer perspective of these phenomena is underexplored especially in empirical inquiries (Fisher & Smith, 2011).

Second, many of the previous studies on value co-creation were criticised for being 'over optimistic' and studying only the positive side of the co-creation without considering the possible failures which is termed as 'value co-destruction' (Ple & Cáceres, 2010; Worthington & Durkin, 2012; Laamanen & Skalen, 2014; Stieler et al., 2014; Carù & Cova, 2015).

Third, limiting the scholarly work to the traditional physical interface, disregarding the revolution taking place in the service environment as a result of technology, is also identified as a gap in the previous research work (Hilton et al., 2013). Many of the previous value co-creation studies focused on physical interfaces, exploring interactive value co-creation between the organisation and the customer in their physical presence, neglecting the role of technological interfaces such as self-service technologies in value co-creation (Kelly et al., 2017).

Finally, lack of clear theoretical foundations and analytical measurements were recognised as another weakness of past studies (Kristensson et al., 2008; O'Shaughnessy & O'Shaughnessy, 2011). The S-D logic also has been criticised as highly metaphorical and failing to identify practical means of assessing co-creation, which leads to misuse and poor focus of empirical studies (Grönroos, 2012; Karpen et al., 2015). In addition, many of the former studies in value perspective were recognised as methodologically qualitative (Brodie et al., 2009), and Neghina et al. (2015) argue that literature on co-creation is stained with significant conceptual confusions and ambiguity.

1.2.2 Gaps in the customer experience literature

The research work on customer experience has been criticised for not adequately contributing towards exploring the realism of the concept. This is illustrated by the statements of renowned researchers, such as, "Marketing research on experience is still relatively underdeveloped" (Schmitt & Zarantonello, 2013:26), "Research on customer experience appears to be in its infancy (Johnston & Kong, 2011:5), "Only a limited number of articles explore customer experience depth from theoretical perspective" (Verhoef et al., 2009:31), and "Despite the recognition of the importance of customer experience by Practitioners, the academic marketing literature investigating that topic has been limited" (Verhoef et al., 2009:31) etc. Most specially, customer value co-creation experience (Gummerus, 2013), when they interact with technologies (Poushneh & Vasquez-Parraga, 2017), is still under explored.

Additionally, an increasing trend of studying customers' hedonic experiences was identified in this experience economy, even though the investigation of the totality of experiences, including both functional and emotional elements within the every stage of consumer decision process is essential to obtain a holistic view about the customer experience (Sandström et al., 2008; Verhoef et al., 2009; Carù & Cova, 2015).

In addition, the customer experience concept in the scholarly work has been criticised for the lack of integration with other concepts in the marketing domain (Homburg et al., 2015). Although there are such deficiencies in scholarly work which guides practitioners (Homburg et al., 2017), a rise of investment in providing extraordinary customer experience is visible in practice (Meyer & Schwager, 2007; Lemon & Verhoef, 2016). However, past studies have shown a disparity between customers' and organisations' viewpoints of experience emphasising that better customer experiences may not be prevalent even though company management think that they are providing a superior experience (Coffman & Stotz, 2007; Meyer & Schwager, 2007).

1.3 The approach of this study to fill identified research gaps

The value co-creation literature has been mainly criticised for, 1. being over optimistic and neglecting value co-destruction, 2. limited to understanding the organisation's perspective on value co-creation, 3. neglecting technological interfaces as a platform for value co-creation and 4. Inadequate work on establishing the theoretical foundations and analytical dimensions of co-creation. The customer experience literature has also been criticised against 1. not being properly connected with other disciplines in marketing, 2. under-exploring the total customer experience perspective and 3. lack of attention given to customer co-creation experience, particularly with technologies.

Against such a backdrop, this research bridges the above identified gaps through examining, both co-creation and co-destruction that take place at technological interfaces from the viewpoint of the customer. Further, the study uses the practice theory as the theoretical foundation to understand co-creation practices in self-service technologies and develops proper analytical measurements with empirical validation. Additionally, the 'total customer experience' (TCE) is examined, exploring both functional and emotional elements, linking with the value co-creation concept.

1.4 Research problem

The central research problem is how and why customers co-create value in SSTs. Specifically 1) whether customers would like to co-create value with self-service technologies, 2) what they do in co-creating value and 3) how they experience their collaboration in SSTs.

1.5 Objectives of the study

In line with the above broad research problem, the following research objectives are developed.

- To understand the customers' value co-creation intention in self-service technologies with its determinants.
- To understand customer value co-creation practices in self-service technologies, including value co-destruction.
- To understand the customer value co-creation experience in self-service technologies and examine the sequential effects of customer co-creation intention, practices and experience.

The following table (table 1.1) summarises the existing research gaps in both value co-creation and customer experience literature, categorising them into three main clusters as substantive gaps, methodological gaps and conceptual gaps. Then, it illustrates the approaches taken by this study to fill these gaps with the research objectives.

Table 1. 1: Research gaps, approaches in bridging them and research objectives

<table>
<tr><th>Substantial Gaps</th><th>Conceptual Gaps</th><th>Methodological Gaps</th><th>To bridge Gaps</th><th>Research objectives</th></tr>
<tr><td colspan="2">Value co-creation literature</td><td rowspan="2">Theoretical limitations (Grönroos, 2012)

Most studies were qualitative (Brodie et al., 2009)

Lack of proper analytical measurements (Karpen et al., 2015)</td><td rowspan="4">Investigate,

Both co-creation and co-destruction

At technological interfaces

From customers' view point

Total Customer Experience (TCE)

Integrate TCE with customer value co-creation.</td><td rowspan="4">To understand customers value co-creation intention in SSTs with its determinants

To understand customer value co-creation practices including value co-destruction in SSTs

To examine the total customer experience and the sequential effect of customer value co-creation intention, practices and experience in SSTs.</td></tr>
<tr><td>Limited to traditional physical interfaces (Hilton et al., 2013)</td><td>Over optimistic (Ple & Cáceres, 2010)

Focused mainly on organisational view (Heinonen et al., 2010)

Highly metaphorical (Karpen et al., 2015)</td></tr>
<tr><td colspan="2">Customer experience literature</td><td rowspan="2"></td></tr>
<tr><td>Less comprehensive studies (Schmitt & Zarantonello, 2013)</td><td>Lack of attention on TCE (Sandström et al., 2008; Verhoef et al., 2009)

Less integration with other concepts (Homburg et al., 2015)

Lack of co-creation experience (Poushneh & Vasquez-Parraga, 2017)</td></tr>
</table>

1.6 Research approach

The previous scholarly work in value co-creation is largely limited to traditional physical interfaces, leaving technological interface underexplored, and none in particularly recognise the co-creation practices at SSTs. Exploratory research studies with qualitative inquiries are undertaken when there is not enough information provided in existing literature, and preliminary work is needed to be familiar with the phenomena (Malhotra & Birks, 2007; Sekaran & Bougie, 2016). However, given the paucity of existing research on value co-creation in technological interfaces (Hilton et al., 2013) and as an initial study in exploring the co-creation practices in the self-service technology context, this study uses a qualitative research approach as the first step in data collection. As discussed in the section on research gaps (1.2), the available research on value co-creation is mostly qualitative, which causes a problem in recognising proper analytical measurements with validation, and consequently, it calls for comprehensive quantitative research work. Therefore, this research uses a 'mixed method' approach with the 'sequential exploratory strategy' involving qualitative data collection and analysis in the first stage followed by quantitative data collection and analysis (Creswell & Clark, 2011; Creswell, 2013). The quantitative data collection tool is mainly built using the findings from the first stage of qualitative study. Semi-structured interviews are conducted for qualitative data collection, and a quantitative based field survey is carried out to enable generalisation of the findings.

The study is carried out in the United Kingdom. In line with previous research work, the purposive sampling method is used in selecting the participants for the qualitative study (study one)(Marcos-Cuevas et al., 2016), and the non- probabilistic snowballing sampling technique is used in selecting the sample for the survey (Truong et al., 2012; Paredes et al., 2014; Greer, 2015; Chowdhury et al., 2016; van Woezik et al., 2016). The respondents for the study are selected considering their age (above 18) and previous use of SSTs. Fifteen and 493 SST customers are taken to be the sample for the qualitative and quantitative studies respectively. Thematic analysis is used to analyse qualitative data, and structural equation modelling (SEM) is used to analyse quantitative data.

1.7 Significance of the study

The Marketing Science Institution (MSI) identified ‘customer experience’ and ‘value creation’ as prioritised research areas in marketing for 2014 /2016. Additionally, although these concepts are not novel, they have been subjected to vast range of scholarly discussions in the 21st century, presenting researchers with many unexplored avenues. As such, this study addresses both the prioritised research areas in the marketing discipline as advanced by MSI and also the previously identified gaps in the literature which need the prompt attention. Therefore, it contributes to both theory building and practical implications in the services marketing and consumer behaviour disciplines.

These research contributions are discussed in detail in the conclusion chapter using the frameworks proposed by Corley & Gioia (2011) and MacInnis (2011). As Corley & Gioia (2011:15) suggest, this study can be identified as ‘revelatory’ in the perspective of the originality. The reason for this is that, breaking the tradition of past researchers in studying the physical interfaces in value co-creation, this study radically moves towards investigating how it happens in technological interfaces and discovers customer value co-creation practices in SSTs for the first time. The study proves the need for urgent attention to SSTs, justifying the feasibility and the appropriateness of applying the co-creation concept to that context, while highlighting the practical implications of it. Further, moving out from the widely held convention, this study investigates the possibilities for both value co-creation and co-destruction, whereas history has mostly tended only to examine the optimistic view of value co-creation. Considering re-testing of prior theories as ‘incremental contributions' of a research, this study applies the practice theory to investigate customer value co-creation practices in SSTs.

This research contributes to scientific utility, as it develops a comprehensive conceptual model connecting value co-creation intention, practices and experiences at self-service technologies. The model is tested for validity and reliability and can be applicable to any technologically supported services. Further, it is open for potential modifications/improvements by any researcher, considering its relevance to other contexts of the marketing or management disciplines.

On a practical level, this study helps business organisations to understand why and how customers interact with SSTs and how they experience the value co-creation in SSTs. This understanding will draw significant managerial implications for managing consumer

experiences commendably. Further, the findings of the study help organisations to understand how to provide technology based successful value co-creation opportunities to customers and to recognise how SSTs should be changed, modified and improved according to customer desires. The contributions of the study are discussed in detail in the conclusion chapter.

1.8 Structure of the report

This report consists of six chapters, as elaborated below:

Chapter One: Introduction

This chapter explains the background of the study, gaps in the literature and the research problem, research objectives, research approach, significance and research contributions.

Chapter Two: Literature review

This chapter consists of three main sections and focuses on reviewing the literature related to the study. The section-1 focuses on the literature on value co-creation while section-2 emphasises the self-service technology context. The section-3 of the chapter is dedicated to the literature on customer experience.

Chapter Three: Methodology

The chapter begins by elaborating the philosophical foundation of the study in section-1. The section -2 describes the research methodology in common. Aligning with the 'sequential exploratory strategy', the next section of the chapter (section-3) discusses the qualitative study design, followed by the qualitative study findings in section-4. The quantitative study design is based upon the qualitative study findings and discussed in the section-5.

Chapter Four: Quantitative study findings

The chapter four is devoted to reporting the quantitative study findings. Prior to that, data cleaning, inspection of multivariate assumptions, selection of software and data analysis methods are discussed in detail. The findings of exploratory factor analysis, confirmatory factor analysis,

validity reliability checks, measurement model development and structural model development are presented accordingly. Finally, hypothesis testing and alternative model development are described.

Chapter Five: Discussions

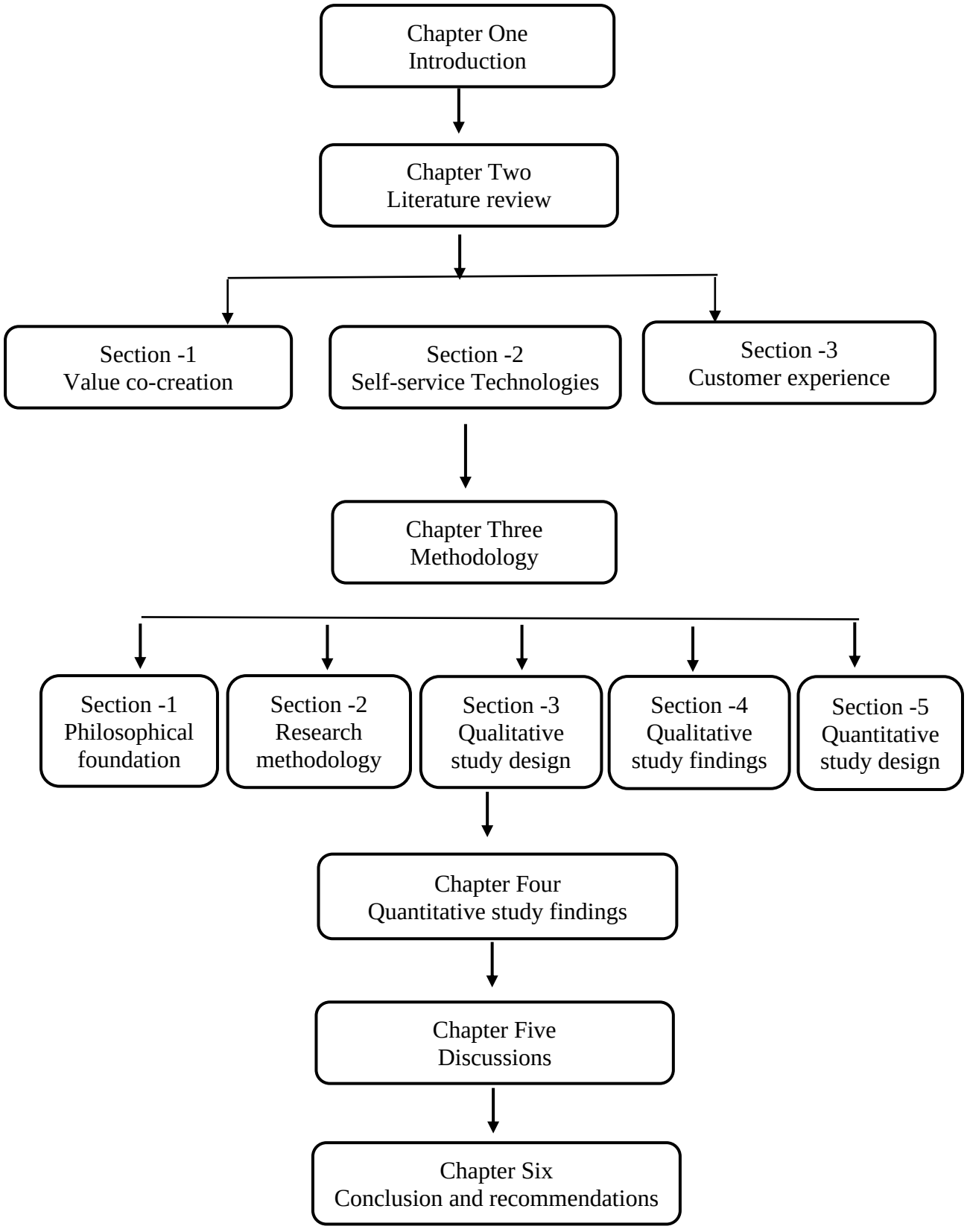
This chapter discusses the outcomes of both qualitative and quantitative studies compared with extant literature, justifying, reasoning and critically evaluating the findings.

Chapter Six: Conclusion

This chapter provides a conclusion for the study, followed by a description of the research contributions including theoretical contributions and managerial implications. Finally, the limitations of the study are acknowledged, followed by suggestions for future research directions.

The following figure (1.2) illustrates the organisation of the report.

Figure 1. 2: Outline of the report



CHAPTER TWO

LITERATURE REVIEW

CHAPTER TWO

LITERATURE REVIEW

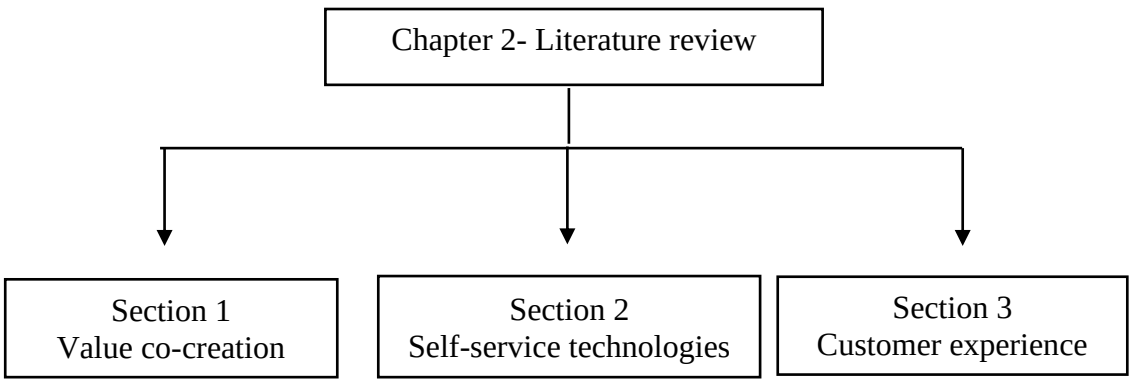
Introduction

This chapter provides insights into the literature related to the main study areas, and is divided into three sections: value co-creation, self-service technologies and customer experience. Section-1 expounds the understanding on value co-creation, discussing the predecessors and relevant concepts, related theories, previous research contributions and gaps in the literature.

Section-2 reviews the literature on self-service technologies (SSTs) reflecting on what self-service technologies are and how value co-creation takes place in such technological interfaces. It explains the current increasing trend towards customer collaborations with self-service technologies in creating their own value and the suitability of applying the co-creation concept to the SSTs. Further, it points out how this practical phenomenon was mistreated by previous scholarly discussions, restricting the value co-creation research to interpersonal interactions. It argues the scarcity of scholarly work in understanding value co-creation in technological interfaces and the desperate need for addressing this gap in this research.

Section-3 provides insights into customer experience, emphasising the importance of understanding the ‘total customer experience' concept. It further elaborates the previous research work, particularly in customer value co-creation experience. The following figure illustrates the organisation of the literature review chapter.

Figure 2. 1: Organisation of the literature review chapter



CHAPTER TWO- SECTION ONE
VALUE CO-CREATION

Introduction

Section One of Chapter Two provides a thorough understanding on value co-creation and is classified into four parts.

Part 1 starts with elaborating the development of service centred marketing. It mainly discusses the movement from a goods-dominant perspective to a service-dominant perspective. Concepts in service-dominant logic are discussed, including fundamental premises (FPs), resource integration and value in use etc. Finally, the criticisms of the service-dominant logic are presented.

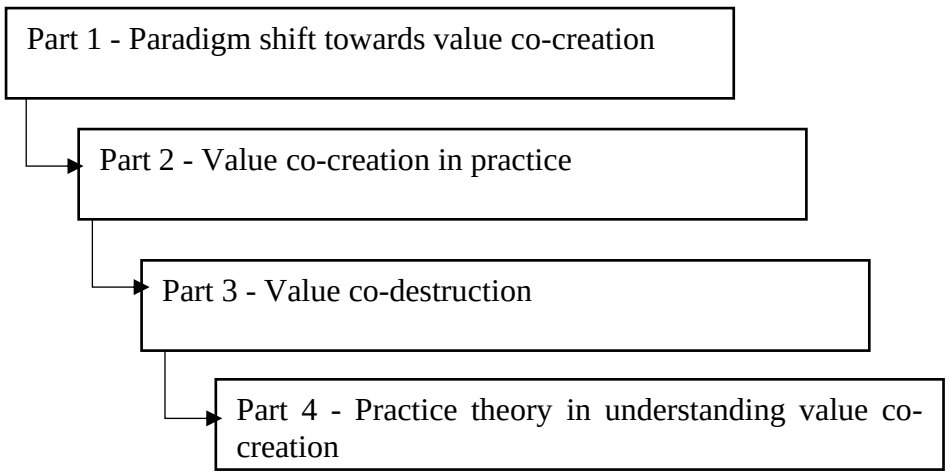
Part 2 explains the practical aspects of value co-creation, expounding the previous research attempts to understand the value co-creation concept in different contexts and the dimensions used in conceptualising the idea.

Subsequently, Part 3 conceptualises the concept of 'value co-destruction' with research evidences, elaborating on the possible failures in the value co-creation process which result in reducing system well-being.

Finally, the practice theory is explained as the underpinning theoretical foundation for understanding customer value co-creation practices in part 4.

The following figure illustrates the arrangement of the main topics in the value co-creation section of the literature review chapter in this study.

Figure 2. 2: Arrangement of the value co-creation literature



CHAPTER TWO- SECTION ONE - PART ONE
THE PARADIGM SHIFT FAVOUR TO VALUE CO-CREATION

2.1.1.1 Introduction

Value co-creation is a practical phenomenon that has evolved through different stages throughout the centuries. Therefore, before moving to discuss 'value co-creation', it is appropriate to widen the understanding to central precursory ideas, which drove marketing to the current debates on collaborative value creation.

Addressing only the major changes in the history of marketing that supported the contemporary discussions on value co-creation, this section explains the evolution of marketing from a 'goods centred view' to a 'service-centered view', elaborating on the concepts in 'goods-dominant logic' and 'service dominant logic' in marketing.

2.1.1.2 The goods centered view of marketing

As opposed to the conception that marketing is a 'twentieth-century phenomenon', many marketing practices indicate that it has been existed long before its formal recognition as a field of study (Egan, 2011), in the pre-industrial era, which focused on 'one-to-one economic exchanges' (Terblanche, 2014).

The history of value perceptions in marketing goes back to the end of the 19th century, to the industrial revolution which gave rise to mass production, enabling producing more items to be made at lower costs (Egan, 2011), and encouraging the organisations to use sales promotions, price adjustments and distribution as marketing strategies to attract more customers (Šonková & Grabowska, 2015). The separation of the producers from the users was a natural outcome of the industrial era because mass production forced producers to sell through intermediaries to the final customers (Sheth & Parvatiyar, 1995). Based on the roots of the industrial revolution, the background of business and commerce was on economic philosophy in which the emphasis was on the exchange of physical units of output (Lusch et al., 2008). In this manufacturing-oriented business environment, services were viewed as just a supporting element to the production task, which only performing a secondary role (Lusch et al., 2008).

‘Transactional marketing’ was the leading trend in the industrial economy that dominated the marketing sector for 40 years from its introduction (Gronroos, 1994). From this perspective, value was established on the premise that the firm creates it by embedding it into the product and provide it to the customer through the exchange process (Lusch & Vargo, 2006b). This practice of providing in-built value is recognised in the ‘commodity approach’ (Egan, 2011) and the concept of ‘value in exchange’ (Lusch & Vargo, 2006b). In marketing, it is similarly viewed in ‘goods-dominant logic', ‘product orientation', ‘marketing myopia', ‘product marketing' and recently ‘marketing management' (Vargo & Lusch, 2008b). However, value creation has been challenged in the past 100 years for considering customers and firms as separate entities, limiting the roles of the organisation to the ‘producer’ and that of the customer to the ‘receiver’ of products/services (Lusch et al., 2008).

In that era, marketing was built upon the ‘value theory’ of economics, and the term ‘marketing’ was mainly described as ‘trade’, ‘distribution’ or ‘commerce’ (Egan, 2011:5). Accordingly, value was considered as the economic value of the product as established by Adam Smith in 1776 in his work ‘The Wealth of Nations’, presuming that value is inbuilt in products through the production process (Lusch & Vargo, 2006b). Literature indicates the multifaceted nature of value (Woodruff & Flint, 2006) and from the economic standpoint, value is defined from the providers’ perspective as “the economic worth of a customer… or the economic worth of a seller’s product/service offerings to a customer” (Woodruff & Flint, 2006:185). Further, value is conceptualised as the actors’ “perceived trade-off between benefits and sacrifices within relationships” (Blocker, 2011:534). Accordingly, the prominence of value and value creation in marketing has a long history (Drucker, 1974; Levitt, 1986). Although value creation has become the ultimate goal of marketing (Gummesson et al., 2010), the ‘value’ concept remains difficult to define, measure and understand throughout its origin (Geraerdts, 2012).

The transactional marketing concept makes a dichotomy between the customer and producer, and therefore value is in a one-way direction from the provider to the customer (Edvardsson et al., 2011). In this traditional firm-centric view, the customer keeps outside the value creation process while the firm controls all the value-adding decisions throughout the value chain (Prahalad & Ramaswamy, 2004b). It is short-term oriented and concentrates on single point of sale transactions, maximising the volume and efficiency of individual sales rather than developing relationships with the customer

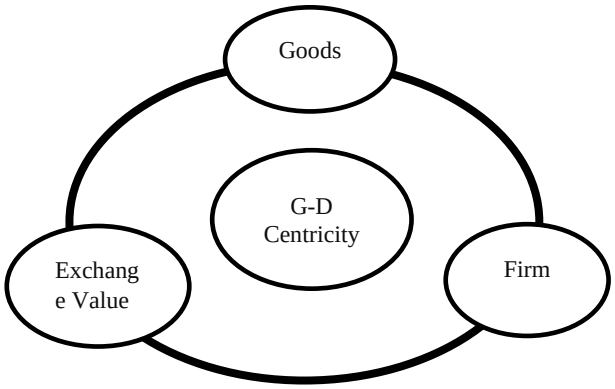
(Gummesson, 2004). Different schools of thoughts explain this phenomenon using different terms such as ‘goods-dominant logic’, ‘old enterprise logic,’ ‘manufacturing logic,’ etc. (Lusch & Vargo, 2014). The following explains the goods-dominant logic in marketing.

2.1.1.3 The Goods-Dominant Logic in marketing

The Goods Dominant logic (G-D logic) originated with sharing the typical features of both the industrial revolution (Vargo & Morgan, 2005) and neoclassical economics. It views “actors as rational, firms as profit-maximising, customers as utility-maximising, information and resources as flowing easily among economic actors, and markets as equilibrium-seeking” (Lusch & Vargo, 2014:1). Therefore, the spirit of G-D logic was the ‘economic exchange’ (Vargo & Lusch, 2008a) and it is usually associated with tangible resources, embedded value, and transactions (Vargo & Lusch, 2004).

Goods-dominant logic is based on main three ‘centricities’: goods centricity, firm centricity and exchange value centricity. Being goods centric is the main problem of the goods dominant perspective, focusing on producing products than providing a solution to customers’ actual problems, which leads to a myopia in marketing. In this perspective, the firm is the only proactive actor and the central partner in economic exchange, which aims to earn profits by ‘producing, selling, and distributing goods' while compromising the real needs of the customers/ consumers (Lusch & Vargo, 2014:2). Goods Dominant logic is more problematic since it implicitly endorses ‘exchange-value centricity’, which depicts the units of outputs as the fundamental components of exchange (Lusch et al., 2007). It recognises value as something, that is added to the products through the production process and delivered to the customer for a price through the exchange process (Lusch & Vargo, 2006b). The following figure visualises the centricities in G-D logic.

Figure 2. 3: G-D logic centricities

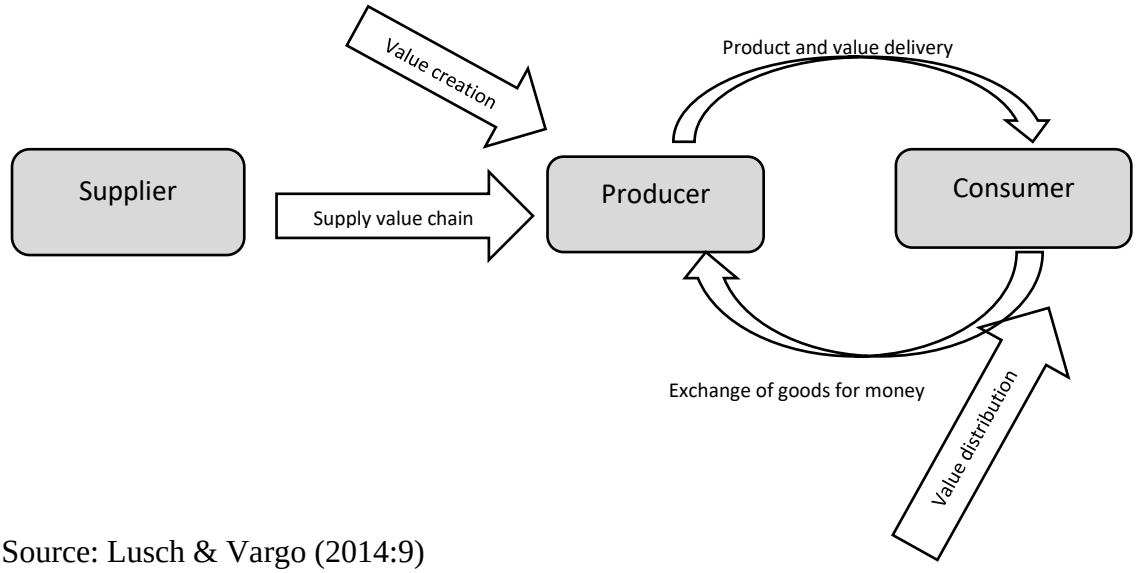


Source: Lusch & Vargo (2014:2)

The G-D logic holds that, "goods (tangible output that embedded with value) as the primary focus of economic exchange, and services (usually plural) as either (1) a restricted type of (intangible) good (i.e., as units of output) or (2) an add-on that enhances the value of a good" (Vargo & Lusch, 2008a:2). The G-D logic of marketing suggests that the preemptive strategies in operating the 4Ps are prominent in competing. Further, it views services as a support to the manufacturing of goods, activity in value adding, or an intangible type product (Lusch & Vargo, 2006b). Producing quality products from the perspective of the manufacturer and distributing them to the customer through effective channels, considering the customer as the receiver at the end, is the practice in the goods dominant view (Lusch & Vargo, 2014).

Value in G-D logic is based on the economic aim of gaining financial benefits through production and distribution of goods (Norman and Ramirez, 1995) and the focus is on delivering 'operand resources' to the customer (Ng et al., 2016). Additionally, it focuses on seeking maximisation of profit, efficient production, standardisation, storage, distribution and marketing and adding value through the provision of utilities based on place, time etc. Therefore, G-D logic pays attention to efficiency rather than effectiveness. With the purpose of improving the efficiency, the production process is made isolate from the customer, and as a result of it, the outcomes become more standardised (Vargo & Lusch, 2008a). This process is depicted in the following figure.

Figure 2. 4: Value creation in Goods-Dominant Logic



Source: Lusch & Vargo (2014:9)

G-D logic provides an adequate foundation when marketing is primarily considered as the ‘distribution of commodities’. However, it is no longer valid when marketing extends its boundaries to wide-ranging issues such as value creation, customer satisfaction, or providing outstanding customer experience (Vargo & Lusch, 2008b).

Therefore, this traditional marketing model is considered as not matching with contemporary marketing practice and has become outdated (Egan, 2011). Over the past few decades, both practitioners and academics have started to realise that the G-D perspective as not enough to compete with the business challenges. Moreover, the development of service economies and the enhancement of technologies caused to discontinuation of the customer-producer separation (Baker 2010). Therefore, the G-D logic was challenged by many marketers and researchers who emphasised the importance of relationships and collaboration between the service provider and the customer in service economies (Sheth & Parvatiyar, 1995).

2.1.1.4 Service centred view in marketing

In the early 1990s, many ‘industrial nations' which were recognised as ‘production-led economies' started transforming into ‘service led’, and the United Kingdom became the first in this revolution, emphasises the importance of the service sector and the need for related research (Egan, 2011:27). Marketing of services emerged in the early 1970s as a separate area of marketing with strategies matching the distinctive characteristics of services (Gronroos, 1994). With that, value creation literature has moved from the firm-driven view (Gummerus, 2013) which was focused on short-term transaction-based marketing (Kotler, 1991) to the relational perspective (Zeithaml et al., 1993). Thus, relationship marketing (RM) became a leading theme for academic discussions in the latter part of the twentieth century (Egan, 2011).

Unlike transactional marketing, relationship marketing seeks to establish long-term relationships with customers and stakeholders rather than focusing on a single transaction and it further emphasises customer retention more than attracting new customers (Šonková & Grabowska, 2015). Relationship marketing spread rapidly in the 1990s (Gummesson, 2002) and has been viewed as a better strategy in the services marketing context (Palmatier et al., 2007) which motivates close interactive relationships with all value chain partners of the firm (Sheth & Parvatiyar, 1995). Berry (1983:25) was recognised as the first to introduce the term relationship marketing, defining it as

"attracting, maintaining and enhancing customer relationships". Gamble et al. (2006:2) similarly view relationship marketing as "all about making adjustments to the way in which a bond is established and built between companies and some of their customers" where the level of the bond varies with different customers.

Relationship marketing comprises three fundamental concepts; relationships, networks and interactions (Gummesson, 2002). Value creation in relationship marketing takes a more interactive and relational form (Gamble et al., 2006) and therefore the marketing function is not narrowed to the marketing or sales departments of the organisation; instead, all are considered as active partners in a win-win relationship (Gummesson, 1994). Further, a need arose for a strategy which can deliver superior value to the customer as compared to the conventional marketing mix (Egan, 2011). Recognizing the inherent problems with the 4Ps and giving due recognition to growing relational appeal in service marketing context, the traditional marketing mix has been expanded to 7Ps, adding three "service Ps": people, physical evidence and process (Šonková & Grabowska, 2015). Further, technological developments allow customer interactions in services, irrespective of physical distance (Palmatier et al., 2007).

Meyer & Schwager (2007) reveal that RM captures what the company knows about the customer, and Kiska (2002) criticised it for conventionally tracking and recording historical service transactions. Schmitt (2003) identifies customer relationship marketing as a misguided approach, which needlessly limits the focus to a narrow function, and notes the need for an approach that takes the customer seriously. Against such a backdrop, the third millennium, research in service marketing has been progressively transformed into a new stage (Gummesson & Mele, 2010) giving priority to the collaborative perspective of value creation (value co-creation) (Michel et al., 2008). The new premise allows customers to join with the organisation in creating value as they wish and therefore customer interactions become the key element (Gummesson & Mele, 2010).

Prahalad & Ramaswamy (2000; 2002; 2004b) note the shift from firm based value creation towards the collaboration between the firm and the consumer in numerous ways, which is now commonly referred to as value co-creation (Cova et al., 2011). Value co-creation typically takes place through interactions and resource integration and therefore, Gummesson & Mele (2010) position it in the broader context of relationships and networks. Grönroos & Ravald (2009) elaborate that the firm is not an agent of producing a ready-made value and therefore not a value creator, but only produces the resources

used by the value creator, i.e. customers. Further, they argue that "value is not produced; resources out of which value can be created and produced" (Grönroos & Ravald, 2011:7). With that, the longstanding viewpoint that value is created by the producer and purchased by the customers became unacceptable (McColl-Kennedy et al., 2009). According to the new premise, there is no separation between service production and the consumption (Michel et al., 2008). Prahalad & Ramaswamy (2002:4) compare the art of co-creation in the traditional company-centric view and the current customer-centric view as illustrated in the following table.

Table 2. 1: Value creation in the traditional firm-centric view vs the modern customer-centric view

Traditional firm-centric view in value creation	**Customer-centric view in value co-creation**
1.The consumer is outside the domain of the value chain.	1. The consumer is an integral part of the system of value creation.
2. The enterprise controls where, when, and how value is added to the value chain.	2. The consumer can influence where, when, and how value is generated.
3. Value is created in a series of activities controlled by the enterprise before the point of purchase.	3. The consumer need not respect industry boundaries in the search for value.
4. There is a single point of exchange where value is extracted from the customer for the enterprise.	4. The consumer can compete with companies for value extraction.
	5. There are multiple points of exchange where the consumer and the company can co-create value.

Adapted from Prahalad & Ramaswamy (2002:4)

The term 'value co-creation' is 'neither historically new nor specific to the 21st century' (Ritzer, 2009). However, current discussions on value co-creation have been intensified with the introduction of 'service-dominant logic' (Vargo & Lusch, 2004). Payne et al. (2009:379) note that the service-dominant logic as a 'proactive and exciting basis' for elaborating marketing from a customer perspective and as the origin point of many recent discussions in value co-creation.

2.1.1.5 Service-Dominant Logic in marketing

Service-dominant logic (S-D logic) is considered as a paradigm shift in marketing from the 'goods-centered view' to a 'service-centered view' (Vargo & Lusch, 2004). It is an emerging school of thought in the marketing and management disciplines (Edvardsson et al., 2011) and describes how to create superior value in conjunction with customers as a source of competitive advantage (Karpen et al., 2012). The key beliefs and aims of service-dominant logic are to conceptualise the service as a process, focusing on vibrant resources including knowledge and skills (Lusch et al., 2008:5).

The S-D logic uses the singular term 'service' representing 'a process of doing something for someone' (Lusch & Vargo, 2014), rather than using the plural 'services', implying 'units of outputs' or a kind of (intangible) products, which goods are not (Lusch & Vargo, 2006b). It defines the service as "the application of specialised competencies (knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself" (Lusch & Vargo, 2006b:283). Lusch et al. (2008:8) recognise service similarly as the "application of specialised competencies (knowledge and skills) for the benefit of another entity, rather than the production of units of output".

Lusch et al. (2007:5) explain S-D logic as,

> "It is a logic that is philosophically grounded in a commitment to collaborative processes with customers, partners, and employees; a logic that challenges management at all levels to be of service to all the stakeholders; a logic or perspective that recognizes the firm and its exchange partners who are engaged in the co-creation of value through reciprocal service provision".

S-D logic is fundamentally characterised by being customer-centric and market-driven, is based on active customer participation (Lusch et al., 2007). Here, the value is presented to the customers in the form of a 'value proposition'. Therefore customer participation is essential for the creation of value (Terblanche, 2014). Goods also remain important in service-dominant logic, but rather than being viewed as containers of value, they are viewed as vehicles for resource transmission (Lusch et al., 2008). Although the traditional goods centred marketing recognised resources acquisition as value creation, in the current service centred marketing, value creation occurs "when a potential resource is turned into specific benefits" which is termed as 'resourcing' (Lusch et al., 2008:8). S-D logic emphasises service to look beyond goods as the basis of economic and social exchange

emphasising the importance of knowledge and skills (Chandler & Vargo, 2011). S-D logic suggests a few transitional shifts from a 'product focus' to a 'service focus', as explained in the following table.

Table 2. 2: Shift of focus from products to service in S-D logic

Product Focus in G-D logic	**Service focus in S-D logic**
Making something (goods or services)	Assisting customers in their own value-creation processes
Value as produced	Value as co-created
Customers as isolated entities	Customers in context of their own networks
Firm resources primarily as operand	Firm resources primarily as operant
Customers as targets	Customers as resources
Primacy of efficiency	Efficiency through effectiveness

Source: Vargo & Lusch (2008a:5)

As the table depicts, the traditional G-D model of value creation was based on the production units of outputs whereas it later became 'services' including intangible outputs. The S-D logic focuses on 'service' which is recognised as a process of applying competencies for the benefit of another entity. Whereas the focus of G-D logic was on efficiency, the S-D logic has a greater emphasis on effectiveness (Lusch et al., 2008). S-D logic is rather a process-oriented logic, which highlights 'value-in-use', whereas G-D logic understands value in the form of 'value-in-exchange' (Merz et al., 2009). According to the S-D perception, there is no value in resources until they are used by the beneficiaries through application and integration. The following table distinguishes between the G-D view and S-D view of value creation.

Table 2. 3: Difference in G-D logic and S-D logic

	G-D logic	**S-D logic**
Value driver	Value-in-exchange	Value-in-use or value-in-context
Value creator	Firm	Firm, network partners, and customers
Process of value creation	Firms embed value in ‘‘goods’’ or ‘‘services’’, value is ‘added’ by enhancing or increasing attributes	Firms propose value through market offerings; customers continue value-creation process through use
Purpose of value	Increase wealth for the firm	Increase adaptability, survivability, and system wellbeing through service
Measurement of value	The amount of nominal value, price received in exchange	The adaptability and survivability of the beneficiary system
Resources used	Primarily operand resources	Primarily operant resources, sometimes transferred by embedding them in operand resources-goods
Role of firm	Produce and distribute value	Propose and co-create value, provide service
Role of goods	Units of output, operand resources that are embedded with value	Vehicle for operant resources enables access to benefits of firm competences
Role of customers	To ‘use up’ or ‘destroy’ value created by the firm	Co-create value through the integration of firm provided resources with other private and public resources

Source: Vargo et al. (2008:148).

S-D logic always appreciates collective practices with customers in value creation and recognises co-creation as “collaborating with and learning from customers, as well as being adaptive to their individual and dynamic needs” (Vargo & Lusch, 2004:5). According to the S-D logic, value can only be created or determined by the user in the consumption process which is referred to as ‘value-in-use’. Value-in-use can occur at the connection of the service provider and the customer over time, either in direct interaction

or mediated by a good (Lusch & Vargo, 2006b). This shows that direct interactions between the customer and the service provider are not necessary for value co-creation and it can take place in other platforms where the customer can interact with the resources provided by the organisation, such as products and technologies.

2.1.1.6 Fundamental premises and axioms of S-D logic

Service-dominant logic is based on eleven fundamental premises (FPs) (Vargo & Lusch, 2016) which form the building blocks of value co-creation. These premises are not a set of 'rules', instead, they represent an emerging and collective effort to create a better marketing-grounded understanding of value and exchange (Payne et al., 2008). They consist of major underlying principles that are important to understand the co-creation dimensions of S-D logic (Terblanche, 2014). Although eight fundamental premises were introduced in the initial stage (Vargo & Lusch, 2004), subsequently they were modified and extended to ten (Vargo & Lusch, 2007) and recently to eleven (Vargo & Lusch, 2016), focusing on the role of the institutions and institutional arrangements in value creation. The following table provides the fundamental premises of S-D logic.

Table 2. 4: Fundamental premises in S-D logic

FP	Foundational premise
FP1	Service is the fundamental basis of exchange
FP2	Indirect exchange masks the fundamental basis of exchange
FP3	Goods are a distribution mechanism for service provision
FP4	Operant resources are the fundamental source of strategic benefit
FP5	All economies are service economies
FP6	Value is co-created by multiple actors, always including the beneficiary.
FP7	Actors cannot deliver value but can participate in the creation and offering of value propositions.
FP8	A service-centered view is inherently beneficiary oriented and relational
FP9	All service and economic actors are resource integrators
FP10	Value is always uniquely and phenomenologically determined by the beneficiary
FP11	Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

Source: Vargo & Lusch (2016:8)

Among these fundamental premises, four premises captured the spirit of service-dominant logic (FP1, FP6, FP9 and FP10), and therefore Lusch & Vargo (2014) especially recognise these four premises as 'axioms of S-D logic'. Vargo & Lusch (2016) categorise their newly introduced 11th fundamental premise as the fifth axiom (see table 2.5). Similarly, Terblanche (2014) recognises three FPs (FP6, FP 7 and FP10) as especially, important in explaining the value co-creation. Therefore, only these fundamental premises are conferred in detail in forming the platform for the discussion of value co-creation in this study.

Table 2. 5: The axioms of S-D logic

Axiom 1/ FP1	Service is the fundamental basis of exchange
Axiom 2/FP6	Value is co-created by multiple actors, always including the beneficiary
Axiom 3/ FP9	All social and economic actors are resource integrators.
Axiom 4/ FP 10	Value is always uniquely and phenomenologically determined by the beneficiary
Axiom 5/FP11	Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

Source: Vargo & Lusch (2016:18)

Axiom 1 (FP1): Service is the fundamental basis of exchange: This premise emphasises that "service is exchanged for service" and further collectively implies "(1) goods are appliances for service provision, (2) all businesses are service businesses, and (3) all economies are service economies" (Lusch & Vargo, 2014:15).

Axiom 2 (FP6): Value is co-created by multiple actors, always including the beneficiary: Vargo & Lusch (2004) originally identify the customer's role as the 'co-producer' and subsequently rephrased it as 'co-creator' (Lusch & Vargo, 2014). Vargo & Lusch (2016) revised this term as 'beneficiary" emphasising the 'multi-actor' nature of the value creation process without being limited to the parties involved in the dyadic exchange but including all others who have direct or indirect interactions in many ways in the value creation process.

Axiom 3 (FP9): All economic and social actors are resource integrators: The S-D logic identifies 'resource integration' as the central practice of value co-creation and two types of resources as 'Operant resources' and 'Operand resources' (Vargo & Lusch, 2004). Lusch & Vargo (2014:15) explain sources of resources as "private sources (e.g., self, friends, family), market sources (i.e., from other actors, through barter or economic exchange), public sources (i.e., collective access from communal and governmental sources), or, most likely, through the service provision of all of these". Value is co-created by integrating these resources in direct or indirect interactions among actors.

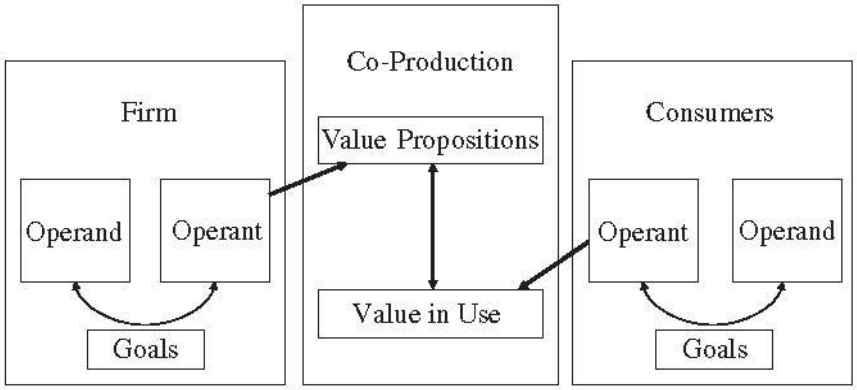
Axiom 4 (FP 10): Value is always uniquely and phenomenologically determined by the beneficiary: This emphasises that the beneficiary derives and determines the value in his/her unique way through the application (use) of a market offering. Further, the premise explains the contextual nature of value creation as it based on a particular perspective (individual viewpoint) and a specific context (e.g., time, place, and social setting). The value is viewed as "improvement of system well-being" which can be measured through the "system addictiveness and ability to fit in its environment" or "an increase in the viability (survivability, well-being) of the system." (Vargo & Akaka, 2012:210).

Axiom 5 (FP11) Value co-creation is coordinated through actor-generated institutions and institutional arrangements: This premise elaborates more on the boundary conditions of S-D logic, emphasizing that it should not be limited to a particular context, a particular type of value proposition (services vs goods) or type of exchange (market vs social). The new premise on value co-creation does not suggest that the beneficiary should always engage in the production process, which means that co-production is not essential in co-creation of value. Further, it accentuates that value co-creation should not be restricted to 'direct, dyadic, one-on-one (i.e., business–customer) interaction'. In short, "S-D logic not only accommodates institutions; the coordinating role of institutions and institutional arrangements is essential for a deeper understanding of the value co-creating processes" (Vargo & Lusch, 2016:19). Therefore, with the fifth axiom, S-D logic becomes more general and focuses on all kinds of 'institutions' and 'institutional arrangements', including service provision through technological platforms, which is the focus of this study.

2.1.1.7 Resource integration as the central practice of value co-creation

The service-dominant logic recognises 'resource integration' as the central practice of value co-creation and identifies two types of resources, 'Operant resources' and 'Operand resources' (Vargo & Lusch, 2004). Operand resources are the resources on which an operation or act is executed to produce a result and are typically physical, inert, finite, static and passive, for example, raw materials or products (Vargo & Lusch, 2004; Arnould et al., 2005; Vargo, 2008). Operant resources are characteristically intangible and invisible resources such as knowledge, skills of employee or consumer (Vargo & Lusch, 2004; Arnould et al., 2005), and often core competencies in organisational processes. Operant resources are dynamic, infinite and produce effects enabling people to enhance the value of natural resources and to generate additional operant resources (Vargo & Lusch, 2004). People have two basic operant resources, physical and mental skills which are not equally distributed (Vargo & Lusch, 2004). The FP4 recognises "Operant resources as the fundamental source of strategic benefit" (Vargo & Lusch, 2016:8). Arnould (2007) depicts the resource integration between the firm and the customer as follows.

Figure 2. 5: Firm and consumer resource integration



Source: Arnould (2007:65)

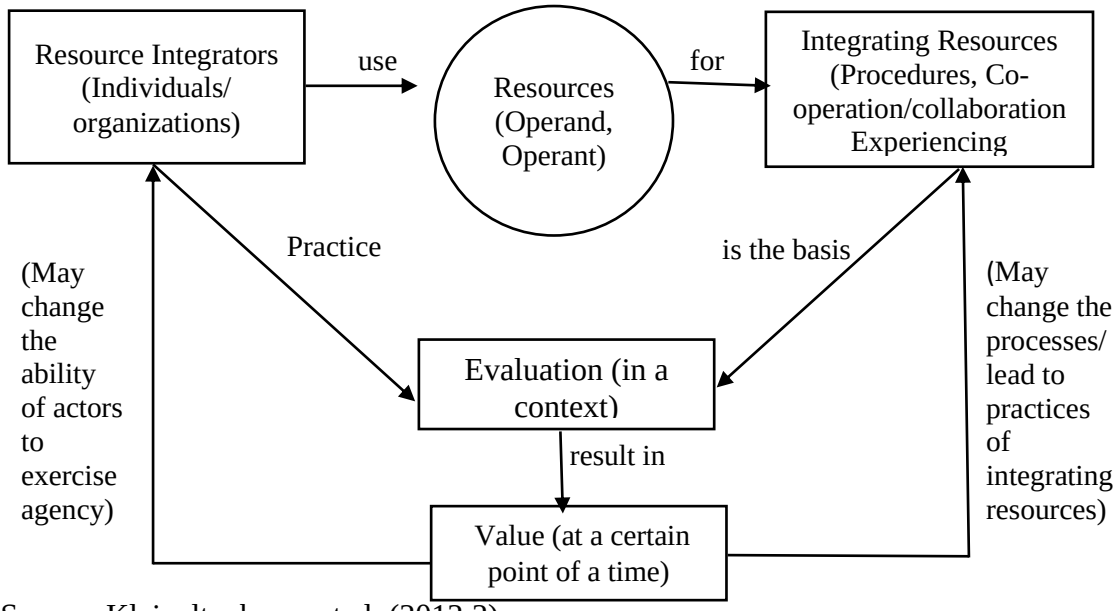
The goods-dominant logic recognises the customer as an 'operand resource' (a resource to be acted on) since marketing strategies such as segmenting, targeting, promotions, distributions can act on customers (Lusch et al., 2007). In contrast, the service-dominant logic acknowledges the customer as an operant resource (a resource which is capable of acting on other resources) and as a partner in collaborative value creation. Arnould et al. (2006:92) recognise major three types of consumer operant resources: cultural operant resources (specialized knowledge/skills, life expectations and history, imagination),

social resources (family relationships, brand communities, consumer tribes, commercial relations) and physical resources (sensorimotor endowment, energy, emotion, strength).

Gummesson & Mele (2010) and Mele (2011) identify multiparty interactions in value co-creation through resource integration. Resource integration in S-D logic is also multi-directional, which gives the meaning to "all parties uniquely integrating multiple resources for their own benefit and for the benefit of others", although still it is service-beneficiary centered (Vargo, 2008:211). Value creation is recognized as "joint integration of resources by multiple actors" (Chandler & Vargo, 2011:35), which is accomplished in forms of private (e.g. personal, internal to the firm), public (e.g., infrastructure, regulations, etc.), and market-facing (e.g., other firms) sources (McColl-Kennedy et al., 2009). Gummesson & Mele (2010:192) view resource integration as co-creation, elaborating "integration of actors' resources in accordance with their (another party's) expectations, needs and capabilities".

Peñaloza & Mish (2011), view the boundaries between operant and operand as unclear and point out the possibilities for one type of resource (e.g., operant) to concurrently take the form of another type (e.g., operand). Kleinaltenkamp et al. (2012) note that regardless of the recognition of the operand/operant dichotomy, technology is a combination of both, although mainly operand, it has abilities in communicating and learning through the use of embedded frozen knowledge (operant resources). The following figure illustrates the resource integration between individuals and organisations.

Figure 2. 6: Resource integration framework



Source: Kleinaltenkamp et al. (2012:2)

As literature suggests (Etgar, 2008; Hughes et al., 2011; Peñaloza & Mish, 2011; Kleinaltenkamp et al., 2012; Hilton et al., 2013), this study acknowledges self-service technologies as operand resources, incorporating frozen and explicit knowledge (operant resources) to provide direction/guidance to the customer on successful self-performance.

2.1.1.8 'Value in use' as the value driver in S-D logic

Vargo & Lusch (2004) note that value is realised by the beneficiary through usage, which is termed as 'value in use' and it is the value driver in the S-D logic. Value becomes 'value in use' when the customer accepts the value propositions presented by the supplier and participates in creating their value (Ballantyne, 2006). Therefore, value-in-use is subjective (Vargo & Lusch, 2004) and ultimately determined by the beneficiary as an outcome of their service experience (Rihova et al., 2013). "Service providers make value propositions, and service beneficiaries are always co-creators of value because they ultimately determine the value of a firm's offering through use and, in a particular, context" (Vargo & Akaka, 2012:210). It is the benefits derived from the co-creation process and further 'always uniquely and phenomenologically determined by the beneficiary' (Vargo & Lusch, 2016:8).

The value-in-use concept implies that, customers create value by using resources or goods/ services provided by the company (Heinonen et al., 2010); thus, value arises in the customers' sphere during the usage of the company- provided resources (Grönroos & Ravald, 2011; Grönroos & Voima, 2012). It means that goods become valuable only through the service application, and therefore the value is determined at the point of use, i.e.' value in use' (Vargo & Lusch, 2004). Lusch & Vargo (2006b) argue that value-in-use can exist without value-in-exchange, but is driven by value in exchange. Literature suggests that the value co-creation process requires a combination of both exchange and use (Peñaloza & Venkatesh, 2006), and places more emphasis on the experiential value-in-use process among consumers (Helkkula et al., 2012). Vargo & Lusch (2008b) highlight 'value-in-use' as an outcome of the value creation process, which is determined by the beneficiary and further it is very close to the concept examined in this study of 'experience in co-creation' (Gummerus, 2013:29).

2.1.1.9 Service ecosystem perspective on value co-creation

The idea that value is co-created by actors (Vargo & Lusch, 2004; 2008a) through their interaction processes (Echeverri & Skalen, 2011) is the basic conceptualisation in contemporary co-creation research work (Fyrberg Yngfalk, 2013). The actor to actor (A2A) perspective in traditional value co-creation research neglects how multiple actors interact in co-creation (Fyrberg Yngfalk, 2013). However, this limitation was remedied when service-dominant logic was revised in 2012 with the introduction of a 'service-ecosystems' perspective, allowing study of the interactions in value co-creation among multiple service systems (Akaka et al., 2012).

The 'service ecosystem' perspective is similar to the 'service system' concept in service science, and is a "relatively self-contained self-adjusting system of resource integrating actors connected by shared institutional logics and mutual value creation through service exchange" (Lusch & Vargo, 2014:24). Service science combines organisation and human understanding with business and technological understanding to categorise and explain the many types of service systems (Maglio & Spohrer, 2007). The smallest service system is the individuals who interact with others, and the largest service system comprises the global economy such as cities, businesses, nations, government agencies etc. (Maglio & Spohrer, 2007). A service system is defined as "any value-co-creation configuration of people, technology, value propositions connecting internal and external service systems, and shared information" (Maglio & Spohrer, 2007:18).

The service ecosystems perspective elaborates social aspects of context and the importance of institutions in value co-creation (Vargo & Akaka, 2012). Kohtamäki & Rajala (2016) view the 'multi-actor collaboration' in value creation as an influencing factor on 'ecosystem-level practices', which effects on competition, strategy formation, innovation etc. Vargo et al. (2015) explain the direct link between institutions and technology, while Chandler & Vargo (2011) view institutions as providers of integrable resources that are continuously assembled and reassembled in value co-creation process. This concept provides a foundation for understanding self-service technologies as a resource provided by organisations for the customer value co-creation process as a link between the organisation and the customer as an alternative to A2A interactions.

2.1.1.10 Criticisms against S-D logic

The S-D logic and most of the past studies on value co-creation have been criticised for clarifying the concept only from the organisational viewpoint and not being very customer-centric (Heinonen et al., 2010; Heinonen et al., 2013). In support of this claim, Heinonen et al. (2010) identify the current research on co-creation as mainly focused on analysing service either from a company point of view or from the perspective of customer-provider interactions. Against this backdrop, they introduce the 'customer dominant logic', to the value co-creation literature (Heinonen et al., 2010). Customer Dominant Logic (C-D logic) addresses the notion that the ultimate goal of service is to facilitate the value of the customer. C-D logic views S-D logic as a 'provider logic' which represents a more advanced company-based view, by seeing the customer as a partner employed by the company in co-creation. However, Gummesson (2008) views S-D logic as more customer-centric and suggests a move from a customer-centric view to a balanced centricity, focusing on many to many marketing and network theory, which is later addressed with ecosystem perspective in S-D logic.

From another perspective, Karpen et al. (2012) criticise the S-D logic for its poor practicality, highlighting the lack of attention given by researchers to finding out the actual collection of capabilities in value co-creation. To address this gap, Karpen devised a conceptual framework which is titled a 'service dominant orientation', converting the S-D logic into S-D practice (Karpen et al., 2012). The service-dominant orientation represents a set of strategic capabilities that enable an organisation to co-create value in service exchanges.

Grönroos (2005) criticises the S-D logic for being predominantly for services, claiming that service logic should also fit with the context of goods-producing businesses. Grönroos (2006) compared the 'service logic' with 'service-dominant logic', highlighting the differences between the Nordic school perspective of service logic. Based on that, Gronroos defines value co-creation as a situation whereby the "firm facilitates processes that support consumers' value creation; due to the consumer's involvement in that interactive process, firms and customers are co-producers of service and co-creators of value" (Grönroos, 2006:324).

Grönroos & Ravald (2009) view S-D logic as highly metaphorical and not proposing theoretically sound foundations and analytical dimensions, which leads to inappropriate measurements in research. They point out that "the concept of value creation and the

Logic's marketing implications are treated in a too simplistic and implicit manner" (Grönroos & Ravald, 2009:3). Therefore, although the service-dominant logic suggests a need for an effective collaboration between the actors, it still remains conceptual (Fisher & Smith, 2011) with few empirical studies testing the effectiveness of this approach in practice (Hardyman et al., 2015).

The S-D logic was criticised for misusing the both 'value creation' and 'value co-creation' terms to indicate two separate definitions (Grönroos & Voima, 2013:135) and the number of varied activities like independent value creations, value creation for another party, joint value-creating activities etc. in a similar manner (Grönroos & Ravald, 2009).

S-D logic was further criticised for being overly optimistic and not discussing the possible failures of value co-creation. Ple & Cáceres (2010) first point out the converse possibility of value co-creation as 'value co-destruction' as a result of misuse of resources. After that, 'value co-destruction' was addressed by many studies in value co-creation from different perspectives.

Among the other criticisms of the S-D logic, it has been recognized as still at the conceptual stage of development (Winklhofer et al., 2013) , a general theory of marketing (Brodie et al., 2011), not been accurately tested (Wright & Russell, 2012) and having theoretical limitations which leads to unsuccessful and lack of clarity in practical testing (O'Shaughnessy & O'Shaughnessy, 2011).

CHAPTER TWO - SECTION ONE - PART TWO
VALUE CO-CREATION IN PRACTICE

2.1.2.1 Introduction

The previous part of section-1 elaborated on theoretical aspects of value co-creation. Given that backdrop, this part of the study explains the practical aspects of value co-creation. It begins by clarifying the concept and moves to understand the similar practices, the customers' and service provider's role in value co-creation, institutional arrangements for value co-creation and the dimensions used in previous scholarly work to assess the value co-creation concept.

2.1.2.2 Value co-creation in practice

Marketing theory is rapidly changing the perception of value as 'produced by firms' to something collaboratively created combining the efforts of firms, customers and the service system. With that, the traditional perspective of value as created by the 'producer' and purchased by the 'customers' became invalid (McColl-Kennedy et al., 2009). The new premise eliminates the separation between the service provider and the customer, providing opportunities for customers to engage with the organisation and create their value as they desire, rather than purchasing what is already manufactured in common (Michel et al., 2008).

The term co-creation is inspired by the service-dominant logic, recognising the key role of the customer in collaborative value creation and become an extensively using term in current scholarly discussions (Ind & Coates, 2013). The co-creation of value is an appropriate goal for firms as it assists them to improve the front-end process by understanding the customers' needs and wants (Lusch & Vargo, 2006b). From the co-creation perspective, suppliers and customers interact with each other for the development of new business opportunities in which value is created, distributed, paid for, and exploited. Thus, it differs radically from the traditional demand vs supply model (Galvagno & Dalli, 2014).

More generally, co-creation is inherent in service businesses (Galvagno & Dalli, 2014) in which market offerings (quantity, quality, attributes) are created in the service encounter

(Bitner et al., 2000). Vargo & Lusch (2016:9) note the occurrence of co-creation through 'resource integration' as "value is not completely individually or even dyadically created, but, rather it is created through the integration of resources, provided by many sources, including a full range of market-facing, private and public actors". According to Galvagno & Dalli (2014:644), co-creation is a "joint, collaborative, concurrent, peer-like process of producing a new value, both materially and symbolically". It eliminates the boundary between the firm and its customers, thus become foundational in marketing (Rose et al., 2011). Ind & Coates (2013) recognise co-creation as a process that providers collaboratively engage with customers to create value. Randall et al. (2011:5) view co-creation as an "evolutionary process that occurs not only between the firm and the customer but also among the community of customers".

Roser et al. (2009) and Roser et al. (2013) recognise co-creation as a process of creative collaboration between the organisation and its customers such that both customer and firm are benefited. Roser et al. (2009) suggest a service firm should consider six questions in providing value co-creation opportunities, which basically lay the groundwork for understanding the practicality of the concept.

- Who will be involved (early adopters, loyal customers,non-users)?
- What is the purpose (e.g. continuous improvements, radical changes, standardising value, customising value, personalising)?
- Where does it occur (Online, offline)?
- How much involvement (Strong, light)?
- For how long (on-off co-creation, ad hoc, regular intervals, continuously)?
- How do you incentivise (motivations for co-creation)?

In services, value co-creation can take place at any stage of the value chain (Yi & Gong, 2013) including the service encounter and the service recovery stage (Dong et al., 2008). Customer value co-creation behaviour is viewed as a multidimensional concept (Yi & Gong, 2013) which is difficult to comprehend (Chan et al., 2010). Payne et al. (2008) note that customer value co-creation should be considered as a dynamic, interactive and non-linear processes. Gummesson & Mele (2010:190) recognise two main phases in value co-creation process; 1) in "A2A (Actor to Actor) interactions where customer and service provider meet in service encounters" and 2) through "the integration of actor's resources and compliance with network member expectations, capabilities and processes" to which the foundation of this study belongs.

2.1.2.3 Distinguishing Customer participation, Service co-production and Value co-creation

The term value co-creation is often confused with customer participation, engagement, value co-production etc. However, value co-creation goes beyond customer engagement or mere participation (Bovaird, 2007) and enhances the end value to the customer by tailoring the product/service according to their expectations (Kristensson et al., 2008). Customer participation is outlined as "the degree to which the customer is involved in producing and delivering the service" (Dabholkar, 1990:484). Bitner et al. (1997) identify three levels of the customer participation as low, moderate and high level, where the low level of customer participation only requires the customer's presence in service delivery, the moderate level involves the customer's inputs and the high level of participation involves the customer as a co-producer. Dong et al. (2008) state that when the level of customer participation increases, the customer is more likely to be a co-creator. Customer active participation with organisations (Ind & Coates, 2013) by way of providing suggestions, being cooperative and conscientious (Bettencourt, 1997) were also research interests in value co-creation. The difference between co-creation and customisation is explained by Kristensson et al. (2008:475) as "the degree of involvement of the customer; in general, the customer plays a less active role in customisation than in co-creation".

The active role performed by the customer in co-production (Cova & Dalli, 2009) was established decades ago (Gronroos, 1978; Lovelock & Young, 2010). It emphasises a firm-centric view of customer involvement (Chathoth et al., 2013) and refers to the participation of customers in the creation of the core offering (Lusch & Vargo, 2006a). Auh et al. (2007:361) define co-production as "constructive customer participation in the service creation and delivery process", asserting the requirement of meaningful and corporative contributions to the service process. Co-production represents a central construct in the service literature (Bendapudi & Leone, 2003) which denotes that service production and consumption take place simultaneously (Lovelock & Wirtz, 2004). Co-opting customer competence is a competitive strategy (Prahalad & Ramaswamy, 2000) which turns the consumer into an actor or a partial employee (Carù & Cova, 2015) and the employee into a partial consumer (Cova & Dalli, 2009). Co-production can occur through shared incentives, co-design or shared production of related goods (Lusch & Vargo, 2006b). The customers' role as co-producer of a service has been thoroughly studied in services marketing literature (Ordanini & Pasini, 2008).

Literature attempts to differentiate between the terms co-production and co-creation, recognising co-production as a component of co-creation (Vargo & Lusch, 2007). Co-production is something close to customer integration in the production process, whereas co-creation is intended to capture the collaborative nature of value creation (Vargo, 2008) and value co-creation can occur with or without co-production (Vargo & Lusch, 2008b). Although the concepts of value co-creation and co-production are different from the production concept in G-D logic, they are nested with similar implications (Lusch & Vargo, 2006b). Etgar (2008) and Terblanche (2014) distinguish between co-production and co-creation with regard to the stage of customer participation, limiting co-production to the production stage. Further, customisation plays a less active role in co-production (Kristensson et al., 2008). As literature suggest, this study views co-production as a component of value co-creation, which is the core value creation activity in self-service technologies.

Service-Dominant logic, in its sixth fundamental premise, recognises the important role of the customer (mostly the beneficiary) in value co-creation. Echeverri & Skalen (2011) note that value should be subjectively assessed from the customer's or the provider's points of view rather than objectively measured; therefore, understanding the customers' and providers' role in value co-creation is essential.

2.1.2.4 Customer role in value co-creation

The traditional goods dominant logic recognises value as an non-interactive form of exchange of products or services to passive consumers (Hunt, 1976). However, the service-dominant logic accepts the active role of the customer in the value creation process and with that, the formal roles previously defined by the firm for the consumer became more dynamic (Cova et al., 2011). The firm cannot create value (Vargo & Lusch, 2008b); rather it offers value propositions, that is, configurations of resources, which customers may draw on to co-create value-in-use (Skålén et al., 2015). Further, the value cannot be created without value-in-use (Grönroos & Ravald, 2011) and therefore it exclusively lies in the customer's domain (Grönroos, 2006). Therefore, the role of the customer is central to the value co-creation process (Aarikka-Stenroos & Jaakkola, 2012).

Customer value creation is "dynamic, interactive, nonlinear and unconscious processes". (Payne et al., 2008:86). Moreover, it is difficult to comprehend, since their roles become

more active, changing their behaviour, cognition, emotion, and attitudes (Chan et al., 2010; Gallan et al., 2013).

The active role of the customer is recognised in service-dominant logic as "customer is always a co-creator of value" (FP6) (Vargo & Lusch, 2008b). However, Vargo & Lusch (2016:10) argue the inappropriateness of using both the terms 'consumer' and 'customer' in understanding value co-creation. This is because, those words imply 'firm-centered orientation' since consumer is defined by "consumption of firm output" and the customer is implicitly bound to identify with a specific firm. Instead of these terms, they propose the word 'beneficiary' to denote the "recipient of service and the referent of value co-creation".

Terblanche (2014:3) understands customer co-creation in terms of "stages they go through when participating, what motivates them to participate, their roles in co-creation, and their participation styles" and recognises that the level of customer involvement differs in different contexts. Customers engage with value co-creating activities through changing their roles to active participants, improving their capabilities which are needed for the collaborative process and contributing their resources to the process of value creation (Michel et al., 2008). Merz et al. (2018) found the importance of 'customer-owned resources' such as their skills, knowledge, creativity, connectedness and their motivation on customer value co-creation.

The concept of value co-creation necessarily follows social structures and takes place within social systems in which the actors (customers and companies) adopt certain social positions which affect the value co-creation (Edvardsson et al., 2011). The customer's role in value co-creation become more complex, especially as it is changing (Cova & Dalli, 2009; Saarijärvi et al., 2013). The actors characterised as resource integrators and the owners of operant resources, influence the co-creation process (Lusch & Vargo, 2014). Such dynamic, interactive processes in the service encounter require a better understanding of the roles of the actors (Broderick, 1998; Epp & Price, 2011) which could prevent the emergence of potential role conflicts (Moeller et al., 2013).

The customer-centric view in co-creation is more emphasised in Customer Dominant Logic (C-D logic) (Heinonen et al., 2010) and provides grounds for customer to customer co-creation (C2C co-creation) which is a dynamic and multi-layered process (Rihova et al., 2013). The C-D stance postulates that service organisations should attempt to discover

what customers do in value co-creation rather than treating customers as partners in co-creation (Rihova et al., 2013).

Bendapudi & Leone (2003) recognise the occurrence of value co-creation through different forms, such as customer emotional engagement, customer engagement in an experience, active customer participation in product designing, self-service, using various processes to solve their problems etc. Preikschas et al. (2017) note that the customer becomes a key resource with vibrant capabilities such as relational, adaptation and innovation to find highly tailored solutions in the process of value co-creation. Prebensen & Xie (2017) recognises the significant contribution of customer psychological participation rather than physical participation in building value perceptions. Six different styles of customer roles in co-creation at the resource integration level are identified; team manager, isolate controller, partner, spiritualist, adaptive realist and passive compliant (McColl-Kennedy et al., 2009).

Prahalad & Ramaswamy (2004a:1) state that consumers who are "informed, networked, empowered, and active" are increasingly co-creating value with the firm. Cova et al. (2015) perceive voluntarily contributing customers as unpaid employees for service organisations. This study explores the prominent role performed by the customers as partial employees in co-creating value at self-service technologies.

2.1.2.5 Service provider's role in value co-creation

Service providers have to provide customers with the necessary resources for their value-generating processes or, from another perspective, facilitate customer value creation by providing the required value foundations (Grönroos, 2008). The service provider develops value propositions, which are the foundation for the value to be used by customers. The co-creation takes place if the customers accept these value propositions during the consumption and add their skills and the additional resources needed into a value-generating process (Grönroos, 2006). The following table expounds the roles of the service provider and the customer in value co-creation.

Table 2. 6: Value facilitation model

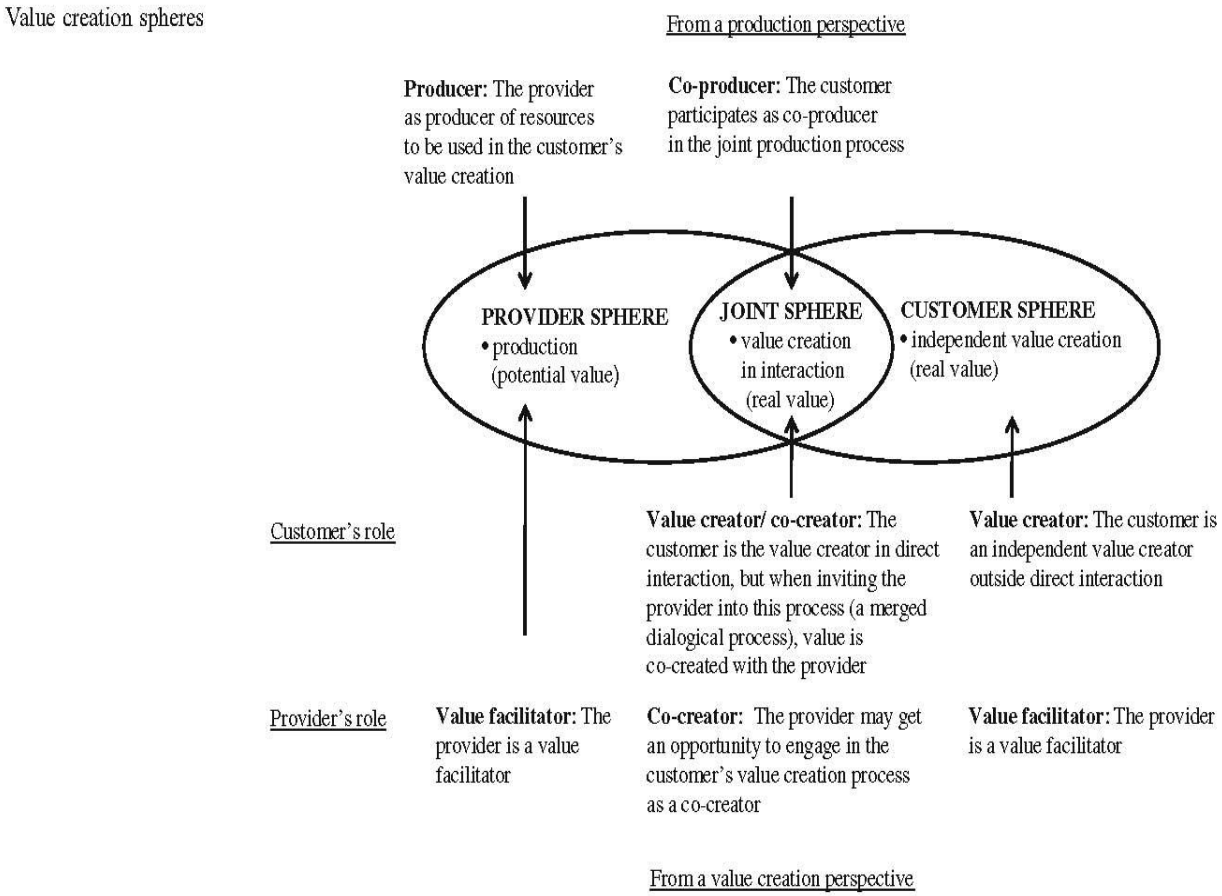
Supplier	Customer
Value facilitator by providing customers with a foundation for their value creation in the form of resources (goods, services, information or other resources)	Value creator during value-generating processes (consumption) where other (necessary) resources available to customers and skills held by them (customer's value foundation) are added and where value fulfilment takes place

Source: Grönroos (2008:306)

Payne et al. (2008) explain that the service provider's responsibility should be to provide 'superior value propositions' since the nature of value propositions influences customers' co-creation ability, satisfaction and in return, company profits. Therefore service providers should produce 'offerings' to match with customer value expectations (Normann, 2001), and as a great connector between the organisation and the customer (Lusch et al., 2010). Service providers can 'impact the relationships' and 'shape the perceptions of value' by offering smart value propositions (Frow et al., 2015:328). Sandström et al. (2008) note two kinds of value propositions that service providers can offer; 1. Functional value propositions and 2. Emotional value propositions. Merrilees (2016) found that customer interactivity is more passive in functional brands than in hedonic brands and therefore these two types of brands result in different kinds of customer engagement and different levels of co-creation.

Grönroos & Voima (2013) differentiate customers' and providers' role in value co-creation as described in the following figure.

Figure 2. 7: Value creation spheres



Source: Grönroos & Voima (2013:141)

However, when the service provider's role is limited to value facilitation, a healthy relationship between the firm and the customer is critical (Jaworski & Kohli, 2006; Payne et al., 2009), which is needed to achieve high quality interactions and dialogue between actors to enhance the nature of engagement (Yi & Gong, 2013). The responsibility of the service provider is to assist the customer to create value from the service perspective, and therefore the firm should create an interactive environment for value creation (Payne et al., 2008). Terblanche (2014:3) recognise firm co-creation as "creating environments that facilitate the customer co-creation and the role of the employee in co-creation". The roles of the employee including 'employee positive psychological capital' (PPC) and 'employee service-oriented organisational citizenship' are the driving forces of stimulating customer willingness to co-create value (Lee et al., 2017). This study views the organisation as a value facilitator who provides value propositions (SSTs and other needed resources) to assist the customer value co-creation process in technological interfaces.

2.1.2.6 Assessing value co-creation

Recent developments in marketing theory are organised around the concept of value co-creation (Laamanen & Skålén, 2015). However, the 'service-dominant logic' which is the base of many existing value co-creation discussions has been criticised as highly metaphorical and not providing analytical measures of the co-creation concept (Grönroos & Ravald, 2009; Fisher & Smith, 2011; Grönroos, 2012; Winklhofer et al., 2013; Karpen et al., 2015). Further, the majority of the previous studies on value co-creation were identified as qualitative (Brodie et al., 2009) and therefore very little co-creation literature provides analytical measures of the concept (Grönroos, 2012; Karpen et al., 2015). Against such a backdrop, some scholars have made efforts to conceptualise value co-creation in different contexts. However, Sandström et al. (2008) note that the dimensions of value co-creation are personal to every individual and thus dependent on the situation in which the customer is acting.

Neghina et al. (2015) view all organisational level capabilities as joint actions or service interaction level capabilities, which are needed to practice value co-creation. Based on the service-dominant orientation proposed by Karpen et al. (2012), they recognise six dimensions of value co-creation; "individuating joint actions, relating joint actions, empowering joint actions, joint ethical actions, developmental joint actions and concerted joint actions".

Three main mechanisms of process-based value co-creation were identified by Payne et al. (2008:85) as,

- Customer value creation processes: "the processes, resources and practices which customers use to manage their activities."
- Supplier value creating processes: "the processes, resources and practices which the supplier uses to manage its business and its relationships with customer and other relevant stakeholders."
- Encounter processes "the processes and practices of interaction and exchange that take place within customer and supplier relationships."

Further, the authors recognise the importance of customer learning, relationship experience, emotion, cognition and behaviour as components of in customer value creation.

Co-creation is an "evolutionary process that occurs not only between the firm and the customer but also among the community of customers" and therefore 'trust, commitment, satisfaction and future intention' are necessary to take place co-creation (Randall et al., 2011:5). Further, integration with customers and association between new capabilities are the primary principles of value co-creation which occurs through 'customisation of competencies and service capabilities' (Zhang & Chen, 2008).

Customer value co-creation behaviour is a multidimensional concept consisting of two higher order factors called 1. 'Customer participation behaviour' and 2. 'Customer citizenship behaviour' (Yi & Gong, 2013:1280).

- Customer participation behaviour is in-role behaviour that is necessary for value co-creation, comprising four dimensions; information seeking, information sharing, responsible behaviour and personal interaction.

- Customer citizenship behaviour is extra-role or voluntarily behaviour that provides value to the firm but is not necessarily required for value creation. It consists of feedback, advocacy, helping, and tolerance.

Value co-creation encompasses three broad categories of practices namely, representational practices, normalising practices and exchange practices. Representational practices are the way consumers see the world and are composed of three main determinants: assimilating, producing and personalising. Normative practices are the way consumers interact with others and comprise mainly bonding, bridging and linking. Exchange practices mean the things the consumer does and are expressed as accounting (searching and selecting), evaluating (sorting and assorting), appreciating, classifying (displaying and demonstrating), and playing (communing and entertaining) (McColl-Kennedy et al., 2012). Busser & Shulga (2018) view "meaningfulness, contribution, collaboration, recognition and emotional response" as important in value co-creation.

Although interaction, participation, and cooperation are the basics in co-creation, it depends on numerous other factors such as 'trust, inclusiveness, and openness, etc. (Pera et al., 2016:8). The role of 'knowledge sharing' is vital in co-creation, as it contributes to enhance trust, build long-term partnerships, and achieve win-win situations (Higuchi & Yamanaka, 2017). Apart from that, value-creating activities, such as 'relating', 'communicating' and 'knowing' provide value-in-use to the customer (Ballantyne &

Varey, 2008). Communication is also vital in co-creation in service innovation (Gustafsson et al., 2012).

Prahalad & Ramaswamy (2004b) suggest four building blocks of co-creation in their DART model; 1. Dialogues (created shared meaning), 2. Access (ownership is not essential, yet access is desirable in value creation), 3. Risk reduction (duties and responsibilities of the firm and consumers in managing the risk), and 4. Transparency. Albinsson et al. (2016) confirm DART as providing a good understanding of how an organisation's policies, procedures, and structures enable or hinder the customer/partner/or firm interactions in value co-creation.

Haas et al. (2012) interpret value creation as an interactive process with four main features; 'jointness, balanced initiative, interacted value, and socio-cognitive construction'. Haas et al. (2012) argue that value co-creation as a hypernymic term used to describe a wide range of activities. A typology has been developed with ten forms of co-creation including 'co-conception of ideas, co-design, co-production, co-promotion, co-pricing, co-distribution, co- consumption, co-outsourcing, co-maintenance, and co-disposal (Frow et al., 2010). Quero et al. (2017) reveal seven types of value co-creation in crowdfunding in the cultural sector as co-ideation, co-design, co-test, co-launch, co-financing, co-consumptions and co-evaluations. Grönroos (2012) develops a model for value creation by combining the resource categorisations from the 'servuction model', based on the notion that the co-creation of value takes place in joint collaborative activities during interactions of the parties.

As above literature suggests, value co-creation is subjective to each individual and different context. Therefore dimensions of value co-creation may vary from personal and situational circumstances. This study aimed to explore customer value co-creation in self-service technologies, which is still rare in scholarly discussions.

CHAPTER TWO - SECTION ONE - PART THREE
VALUE CO-DESTRUCTION

2.1.3.1 Introduction

The previous part of the chapter elaborated the positive view of value co-creation. However, the history of value co-creation research work has been criticised for being over-optimistic by not spotting the possible failures of the collaborative value creation process which is termed as value co-destruction (Ple & Cáceres, 2010; Echeverri & Skalen, 2011). This part of the study attempts to understand the concept of 'value co-destruction' elaborating its theoretical and practical conducts.

2.1.3.2 Value co-destruction

Value co-creation is a process that occurs in situations in which the customer accepts the value propositions offered by the service provider for their resource integration (Vargo & Lusch, 2004; 2008b). Therefore, the potential for co-creation depends on "how adaptive an actor is, that is, an actor's ability to work with others (either actors or resources) in a mutually beneficial manner" (Fyrberg Yngfalk, 2013:1165). It suggests that if the actor is unable to interact with the service system and appropriately integrate resources, it causes failures in value co-creation. Ertimur & Venkatesh (2010) challenge the pre-assumption of value co-creation that the consumer constantly behaves in a collaborative and cooperative manner, saying that value co-creation is also vulnerable to opportunistic behaviours of consumers.

Ple & Cáceres (2010) criticise the value co-creation in service-dominant logic as an over-optimistic view, pointing out the converse possibility which is neglected by the discussions in S-D logic, which they name 'value co-destruction'. They further argue that value can be destroyed through interactional process and marketing remains deficient in understanding it. The same weakness of S-D logic of assuming all actors' interactions are uniform was challenged by Echeverri & Skalen (2011), suggesting that co-destruction is an equally possible consequence of actors' interactions.

2.1.3.3 Defining value co-destruction

Vargo et al. (2008:149) define 'value' as "an improvement in system wellbeing" and recognise well-being in terms of "system adaptiveness or ability to fit in its environment". Therefore, value co-creation should constantly result in enhancing the system well-being. Diener et al. (1999:276) define well-being as a 'broad category of phenomena that include people's emotional responses, domain satisfaction and global judgements of life satisfaction'. Seligman (2002) in Diener & Seligman (2004:1) define well-being as "peoples' positive evaluations of their lives, includes positive emotion, engagement, satisfaction, and meaning". Diener & Seligman (2004) show the need for measuring well-being, including 'people's happiness, meaning, and engagement' on an ongoing basis in different situations in order to realise when and why people are unhappy or happy. Diener et al. (2006:10) note the importance of the understanding well-being to increase the 'engagement, joy, trust, and affection of ordinary citizens who do not have extraordinary problems'. Keyes et al. (2002) classify research traditions in well-being into two streams as 'subjective well-being (evaluation of life regarding satisfaction and balance between positive and negative affect) and psychological well-being (perception of engagement with existential challenges of life).

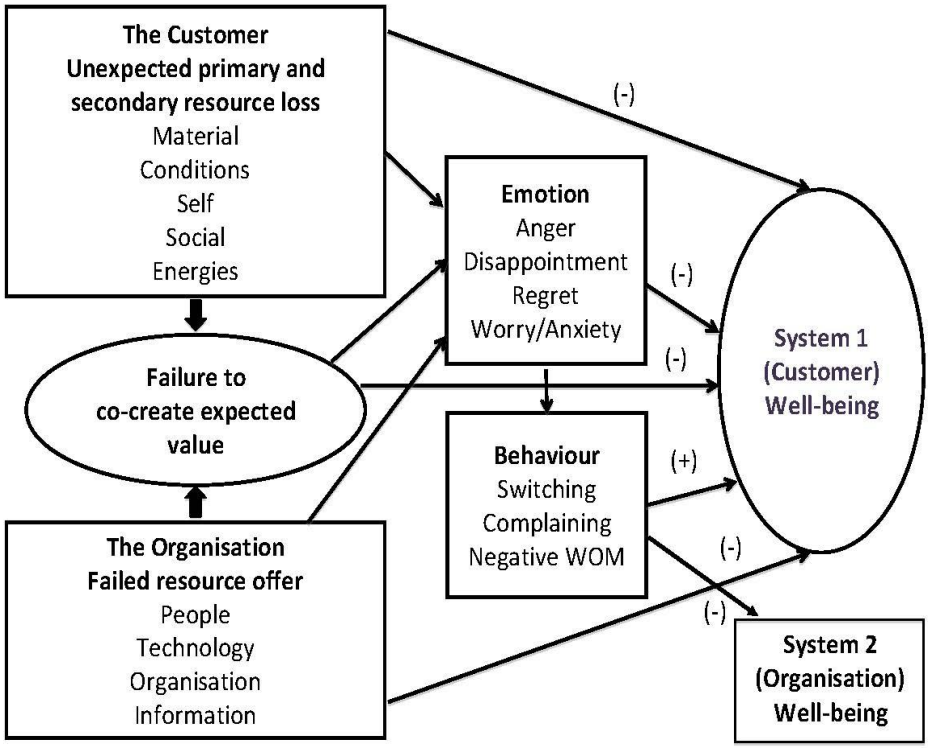
Aligned with these descriptions of value, value co-creation and system well-being, Ple & Cáceres (2010:431) define 'value co-destruction' as "an interactional process between service systems that results in a decline in at least one of the systems' well-being (which, given the nature of a service system, can be individual or organizational)". According to them, incidental or accidental misuse (failure to use resources in a manner that is appropriate or expected by the other service system) of resources (both operant and operand) by any member of the service system is the main reason for value co-destruction. Stieler et al. (2014:72) define value co-destruction as "not only an actual decline in value experienced but also the negative deviation from the expected enhancement of well-being".

2.1.3.4 Value co-destruction in practice

Positive outcomes are not always guaranteed in co-creation, and co-destruction is viewed as a "process by which value can be destroyed when two parties interact with each other to create value" (Terblanche, 2014:7). The following figure illustrates the reasons for value co-destructions and the influence of such failures on both customers' and

organisation's emotions and behaviours and finally the well-being of both parties (systems).

Figure 2. 8: Value co-destruction – a customer resource perspective



Source: Smith (2013:9)

According to Smith (2013:9), the wellbeing of customers (system 1) may be reduced and finally result in vaue co-destructions due to three main reasons 1) the organisation (system 2) fails to offer suitable value propositions for customer value creation process; 2) failures in co-creating value in the expected manner through the resource intergration process; 3) if the customer experiences unexpected resource loss such as loss of materieals (tangible and intangible objects), conditions (respondnets' perception on how the service encounter affected their win status in the eyes of others), self (self esteem and self efficacy), social (social support emerging from the environment) and energies (time, money, knowledge) etc.

Chan et al. (2010) recognize motivating customers to engage with co-creation as a 'double-edged sword', mainly because, although customer participation strengthens the bond between the employee and the customer by enhancing 'interaction enjoyment', at the same time it can result in increasing the job stress of the employee which finally

causes to reduction of job satisfaction. They argued that this problem is typically high with people with 'high individualism' and 'lower power distance in value creation' (Chan et al., 2010:22). Further, they found that the level of value creation depends on the 'partner's cultural value orientation' and that a mismatch between the customer's and employee's cultural values causes failures and dissatisfactions.

Echeverri & Skalen (2011) study the interactive value formation at the provider-customer interface and recognise the duality of value outcomes, as co-creation and co-destruction. They reveal how the same value practice may result in value co-creation to some people, while causing co-destruction to some others. According to them, value co-creation and co-destruction are key dimensions of the value practices, which depend on the expectations and perceptions of the parties and the situation and personal characteristics. They suggest that the success of interactive value formation depends on the providers' and customers' thinking on congruent (in the case of value co-creation) and incongruent (in the case of value co-destruction) elements of the practice. They explain it further taking one value practice 'greeting' as an example; although generally it is considered as friendly co-creating behaviour, some people may perceive it as annoying in some situations, if they are in hurry or a bad mood. The quality of interactions becomes fundamental in value co-creation, and if the customer does not have the necessary skills and resources, it would be disadvantageous. It proves that operant resources have the potential not only to co-create but also to co-destroy value (Echeverri & Skalen, 2011).

Carù & Cova (2015) categorise value outcomes into three groups as 'co-creation, mixed and co-destruction'. Aligning with Echeverri & Skalen (2011), they also emphasise the possibility of there being both positive and negative effects of the same practice. Smith (2013) recognise value co-destruction in resource integration due to the organisation's misuse of customers' resources, such as their material, leisure, financial, knowledge, self-efficacy, hope etc., which leads towards loss of well-being and negative emotional and behavioural responses. Cova & Paranque (2016) study value co-creation and its tragedy (co-destruction) for business organisations, considering the relationships among consumers, marketers and financiers in the brand community.

Collective and conflictual value creation was studied by Laamanen & Skalen (2014) who refer conflictual perspective as the dark side of value co-creation. They contend that conflicts typically occur due to mismatches between 'perceived' and 'experienced' value and (non)fulfilment of customers' value-in-use by the provider's value propositions.

Further, they note that settling conflicts in an appropriate way results in satisfaction and loyalty. Mele (2011) also expounds the conflicts in value co-creation, recognising five main types of conflicts namely, task-related conflicts, process related conflicts, role-related conflicts, effective conflicts and value related conflict. Further, these conflicts can have positive as well as negative impact resulting in constructive or destructive critical events, of which the latter cause damage interpersonal relationships. Further, unresolved disputes cause harm to the well-being of both parties, diminishing trust, commitment and cooperation.

Opportunistic behaviour of consumers, including 'active opportunism' (involves a violation of the social contract that governs firm–consumer relations in co-production) and 'passive opportunism' (when the consumer does not expend the necessary information and effort in participating in the creation of the core offering) reduces the co-creation ability (Ertimur & Venkatesh, 2010:259).

Heidenreich et al. (2015) show that increased customer participation reduces the firm's control over the outcome, which increases the level of uncertainty and risk. They contend that in highly co-created services, customers seem to be responsible for failures, which make them feel guilty and therefore they can alleviate the guilt by actively engaging in the recovery actions. As Parasuraman (2006) suggests, a high level of involvement increases the level of complexity, and then it leads towards service failures. As opposed to that, in low co-created services, customers may blame the other parties, mainly the service provider for service failures, since they have not been much involved in the service process. Illustrating this point, Bitner et al. (1990), note that when things go wrong in self-service technologies, customers blame themselves fully or partly for the failure and this would be a reason to be less dissatisfied with the service provider. Chowdhury et al. (2016) explore the dark side of value co-creation in B2B context, including role conflicts, lack of clarity on performance due to shared responsibilities, opportunistic behaviours and power inequities in relationships, as major sources which influence co-destruction.

Stieler et al. (2014:72) view value co-destruction as one of a diverse range of outcomes of the interactions which depends on the value expectation of individuals. Further, value co-destruction is not a single value dimension, and therefore one reason for destruction can be easily caused by another, creating risk and negative outcomes. Gursoy et al. (2017) study disruptive customer behaviours (misbehaviours) which cause poor service

experience and Shin et al. (2017) point out the importance of proactive customer interactions for service failure prevention, rather than focusing on reactive actions to recover the service failures.

Summarising, the literature identifies value co-destruction and poor service experiences as resulting from misuse of resources (Ple & Cáceres, 2010:434), errors with the service firms and service communities (Worthington & Durkin, 2012), incongruence between the service provider and customer (Echeverri & Skålén (2011), unmanageability of practices (Carù & Cova, 2015), opportunistic behavior (Ertimur & Venkatesh, 2010), high customer involvement (Heidenreich et al., 2015) and disruptive customer behaviours including misbehaviour of customers (Gursoy et al., 2017).

Following the literature, (Schau et al., 2009; Echeverri & Skalen, 2011; Carù & Cova, 2015), this study views value co-destruction as an equally likely consequence of customer value co-creation practices, which diminishes their wellbeing. Therefore, this study investigates how both value co-creation and value co-destruction take place in self-service technologies from practice theory perspective. The following section explains the practice theory as the theoretical foundation for this study.

CHAPTER TWO - SECTION ONE - PART FOUR
THEORETICAL FOUNDATION TO UNDERSTAND VALUE CO-CREATION

2.1.4.1 Introduction

The literature on value co-creation has been criticised for not formulating sound theoretical foundations and analytical dimensions in measuring the concept (Grönroos & Ravald, 2009; O'Shaughnessy & O'Shaughnessy, 2011; Wright & Russell, 2012; Winklhofer et al., 2013). Against this backdrop, Carù & Cova (2015) and Neghina et al. (2015) suggest that the focus on practices is one of the better ways to understand value co-creation. Therefore, this section explains the importance and use of 'practice theory' in understanding the customer value co-creation.

2.1.4.2 Practice Theory

Practice theories are a long-standing stream of sociology (Warde, 2005), derived mainly from cultural theory (Reckwitz, 2002) and extensively used Consumer Culture theorists to discover the practice of consumption (Halkier & Jensen, 2011). Practice theories consider humans as agents who behave within the structures of various practices, and is useful for understanding changes that occur within practices over time or evolutions, particularly with the impact of technological innovation (Spotswood et al., 2015). Frohlich et al. (2001) note that practice theory is helpful for understanding the relationship between practices and wider social systems, which are difficult to isolate and analyse independently.

Practice theory usually helps to understand 'what people do' or human 'action' instead of the focus on history on behavioural understandings. Practices are any kind of activities performed in a routinised and culturally normative way, such as simply showering (Hand et al., 2005) or car driving (Rettie et al., 2012). Practices are defined as "a routinised way in which bodies are moved, objects are handled, subjects are treated, things are described, and the world is understood" (Reckwitz, 2002:250).

‘Practice’ is outlined by Reckwitz (2002:249) as,

> “A routinised type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge.”

In performing such routine practices, people are mostly not mindful enough to fully understand the behaviour, since their routinised performances are treated cognitively at the most superficial level (Spotswood et al., 2015).

> “Thus theories of practice emphasise processes like habituation, routine, practical consciousness, tacit knowledge, tradition, and so forth, performance in a familiar practice is often neither fully conscious nor reflective” (Warde, 2005:140).

Since ‘routine behaviours’ are considered in practice theory, ‘experience’ is imperative, as it makes people less attentive towards the practices that they perform on a day to day basis (Warde, 2005).

According to Schatzki (1996:91), practice theories are ‘neither individualistic nor holist’ and concern main two types of practices. ‘Dispersed practices’ appear in many aspects of social life such as ‘describing, following rules, explaining and imagining’ etc. ‘Integrative practices’ are more complex, such as farming, business, teaching and cooking, and require specialised forms of dispersed practices.

Social Practice Theory conceptualises people as carriers of practices (Shove et al., 2012) which can be decomposed into several interconnected elements (Reckwitz, 2002). According to the simple model devised by Shove et al. (2012:14), there are three main components in the social practice framework.

- Materials: (including things, technologies, tangible physical entities, and the stuff of which objects are made)
- Competencies: (which encompass skill, know-how and technique)
- Meanings: (symbolic meanings, ideas and aspirations)

Schau et al. (2009), explain practices as linking behaviours, performances and representations through ‘understanding, engagements and procedures’.

> “Practices are linked and implicit ways of understanding, saying and doing things. They comprised a temporally unfolding and partially dispersed nexus of behaviours that include practical activities, performances, representation or talk. Practices link behaviours, performances, and representations” (Schau et al., 2009:31).

Schau et al. (2009:30), view these three (understanding, engagements and procedures) as the ‘anatomy of practices’ which are essential in performing practices in an expected manner.

> “Practices have an “anatomy” consisting of (1) general procedural understandings and rules (explicit, discursive knowledge); (2) skills, abilities, and culturally appropriate consumption projects (tacit, embedded knowledge or how-to); and (3) emotional commitments expressed through actions and representations” Schau et al. (2009:30),…‘practice similarly demonstrates a physiology in which these anatomical parts function together. Practices vary in their anatomy, but in their physiology, they vary across communities’ Schau et al. (2009:35)

‘Procedures’ are explained in detail as “explicit rules, principles, precepts and instructions called ‘discursive knowledge” and ‘understandings’ as “knowledge of what to say and do, skills and projects know-how”. ‘Engagements’ are described as “ends and purposes that are emotionally charged to get personal commitments” (Warde, 2005; Schau et al., 2009:31; Echeverri & Skalen, 2011:356). Further, Schau et al. (2009) point out that practices drive one another and work together to achieve a common goal and further the possibilities for combining practices in complex ways. Apart from that, practices function in such a way that their effects evolve as consumer engagement expands and practices are integrated.

Reckwitz (2002:250) contends that ‘understanding, knowing how and desirings’ are elements of practice. Spotswood et al. (2015) note that the starting point for a practice-based research should be to understand the links between these integral elements, rather than presuming that people are responsible, powerful or capable of being actively involved with practices. Taking examples from practices such as cycling, smoking or

unhealthy eating, she emphasises the importance of starting with an analysis of the basic elements of the practices rather than directly moving to explore the activities.

Korkman et al. (2010:237) view practices as a continuum from ‘objective’ to ‘subjective’. They recognise some practices as innovative and creative, while some are practically established and imitative. Further, they identify the development of technology as a base for creating many new forms of practices including activities performed by ‘arms-length’, which are now being adopted by the majority of people. Korkman et al. (2010) recognise that the practice-based approach is more systemic and different from processes, which describe workflows of actions, although such processes also become a part of practices. These potential benefits of practice theory notwithstanding, it is important to emphasise that the theory has yet to be adopted and tested as a model or management tool.

2.1.4.3 Practice theory in understanding value co-creation

S-D logic proposes ‘resource integration' as the central practice in value co-creation and all social and economic actors as resource integrators (Vargo & Lusch, 2008b). Although, value is “individually and phenomenologically determined by the beneficiary” (Vargo & Lusch, 2016:8), the process in which value is created consists of interactions and resource integrations (Fyrberg Yngfalk, 2013). Therefore, Vargo & Akaka (2012:211) suggest the appropriateness of practice theory to understand value co-creation by exploring these interactions and resource integrations. Further, they note that, when practices are enacted, resources are integrated, and therefore resource integration makes more explicit connection between the co-creation and practice theory.

Vargo & Lusch (2016) added the ‘full institutional perspective’ to S-D logic, which explains the possibility of co-creation taking place not only with institutions but also through the institutional arrangements provided by the institutions as ‘institutionalised solutions’. This new perspective is highly related to the practice theory in sociology, since the S-D logic changes its focus from ‘production output’ to ‘activities and processes’ such as ‘resource integration, service exchange, and value creation and determination’ (Vargo & Lusch, 2016:19). Advancement of technologies in service provision through the (re) combination (integration) of useful knowledge, which is termed as the ‘duality of technology’, also can be explained by the practice theory (Vargo et al., 2015; Vargo & Lusch, 2016).

Carù & Cova (2015) suggest that exploring practices is one of the better approach to understand the value co-creation. Equally, Neghina et al. (2015) acknowledge that understanding the actions of actors using the practice theory as a good starting point for co-creation studies. This is because, social practice theories are commonly used in enriching the comprehension of 'what people do' (Schatzki et al., 2001) and are particularly suitable in illustrating changes that occur within practices over time (Spotswood et al., 2015). However, since practices are changing (possibly evolving) over time, scholarly work should focus on understanding opportunities and challenges, including the 'temporal nature of practices and experiences, evidence about value, and the inter-subjectivity of social relations'. (Helkkula et al., 2012:554).

2.1.4.4 Practice theory in past value co-creation studies

Schau et al. (2009) were the first to use practice theory in value co-creation research emphasising, 'collaborative practices' as characterised by being collectively agreed upon. They identify 12 value-creating practices in brand communities and categorise them into four groups namely, social networking (welcoming, empathising, governing), impression management (evangelising, justifying), community engagement (staking, milestoning, badging, documenting), and brand use (grooming, customising, commoditising) (Schau et al., 2009:36).

Echeverri & Skalen (2011) explore the interactive value formation considering co-creation and co-destruction as two key dimensions of the value practices. They recognise five interactive value practices as 'informing, greeting, delivering, charging, and helping' in transportation. Acknowledging Schau (2009), they also argue that these value practices are made up of 'elements of practices' such as 'procedures, understandings and engagements'. Echeverri & Skalen (2011) argue that when actors enact practices incongruently, value co-destruction ensures meaning that value-in-use diminishes for the interacting actors.

Based on the work of Echeverri & Skalen (2011), Camilleri & Neuhofer (2017) uncover six value creation practices between guest and hosts in the hospitality sector, with the evidence on how these practices cause to both aspects of co-creation and co-destructions. These practices are 'welcoming, expressing feelings, evaluating location and accommodation, helping and interacting, recommending and thanking' (Camilleri & Neuhofer, 2017:2328).

Customer value co-creation activities are defined by McColl-Kennedy et al. (2012:7). “activities that individuals carry out with others integrating resources from the focal firm, other market-facing or public sources, private sources and through self-activities using personal sources”. They identify eight value practices including cooperating, collating information, combining complementary therapies, co-learning, changing ways of doing things, connecting, coproduction and cerebral activities with self-engagements that finally contribute to the co-creation of value. They categorise these value practices into five groups, yielding a typology of practice styles including team management, insular controlling, partnering, pragmatic adapting, and passive compliance. Strengthening the research work of (McColl-Kennedy et al., 2012), Tommasetti et al. (2015) develop a conceptual framework for customer value co-creation behaviour that comprises eight value practices. They are, cerebral activities, cooperation, information research and collation, a combination of complimentary activities, changing habits, co-production, co-learning and connection (Tommasetti et al., 2015). Value co-creation comprises three broad categories of practices, namely, representational practices (assimilating, producing and personalizing), normalizing practices (bonding, bridging and linking) and exchange practices (accounting; searching and selecting, evaluating; sorting and assorting, appreciating, classifying; displaying and demonstrating and playing; communing and entertaining) (McColl-Kennedy et al., 2012).

Carù & Cova (2015) recognise eight common value practices in the brand community, namely executing, helping, informing, judging, performing, queuing, value sharing and volunteering. They categorise these eight activities based on two major criteria as initiators of the practice and the effects of the practice. The community, company or joint initiatives are recognised as the initiators, while the impacts of the practice are perceived as positive, negative and combined effects of service experience such as ‘co-creation, mixed and the co-destruction'. Aligning with Echeverri & Skalen (2011), they also emphasise the possibility of both positive and negative effects for the same value practice. Laamanen & Skalen (2014) view the possibilities for value co-destructions related with performing value co-creation practices.

> “Consequently, value co-creating practices can have adverse impacts on particular actors, dominant ideologies or established and accepted social practices. In effect, the value co-creating practices of these challenges may not reap mutual or

universal benefits where they reconstruct various fields in the society" (Laamanen & Skalen, 2014:13).

Ng et al. (2016:391) found eight resource-integration activities among professional service providers, arguing that it is difficult to find best practices, instead, different styles are adopted based on the individual's needs. Payne et al. (2008:382) recognise two perspectives of customer learning in co-creation as first, 'using a sense-making, cognitive perspective', and second, 'identifying the experiences embedded in the co-creation processes. Social marketers can use practice theory to frame their contribution to the strategic planning of interdisciplinary solutions, which has been identified as the future of effective behaviour change (Spotswood et al., 2015).

Korkman et al. (2010:236) propose the Practice-based approach as a 'conceptual tool' to understand 'resource integration' and 'value creation'. Further, they suggest improving service-dominant logic by including practice-based perspectives such as,

(a) "practices are fundamental units of value creation (value is created as actors engage in practices",

(b) "practices are resource integrators (value is created as customers integrate sociocultural resources."

(c) "firms are extensions of customer practices (customers are not extensions of firms' production processes; value co-creation happens as firms participate in customer practices."

(d) "value propositions are resource integration promises (firms enhance value creation by providing resources that 'fit' into customers' practice constellations."

The literature has revealed co-creation practices in healthcare (McColl-Kennedy et al., 2012), transportation (Echeverri & Skalen, 2011), branding (Schau et al., 2009; Carù & Cova, 2015), the hospitality sector (Camilleri & Neuhofer, 2017), the B2B context (Kohtamäki & Rajala, 2016), professional services (Ng et al., 2016) and e-invoices (Korkman et al., 2010) etc. However, the evidence suggests that only sporadic attention has been given to understand value co-creation practices in technological interfaces, and particularly to explore customer value co-creation practices in self-service technologies. Therefore, this study focuses to investigate customer value co-creation practices in self-service technologies from the practice theory perspective, as one of its main objective.

CHAPTER TWO - SECTION TWO
SELF–SERVICE TECHNOLOGIES AS TECHNOLOGICAL INTERFACES IN VALUE CO-CREATION

2.2.1 Introduction

This section begins by expounding the understanding of self-service technologies and subsequently moves to discuss value co-creation in self-service technologies. The applicability of service-dominant logic and other relevant concepts to explain co-creation in technological interfaces and customer acceptance of self-service technologies in value creation are particularly addressed.

2.2.2. Self-Service Technologies

Servicescape/service setting, which can be a place, or a space is recognised as critical in value creation. Traditionally, the service encounter was narrowly viewed in terms of a service place where interpersonal interactions took place in between the customer and the service provider (Solomon et al., 1985), and was defined as "the dyadic interaction between a customer and service provider" (Surprenant & Solomon, 1987:87). Solomon et al. (1985) identify important perspectives of the service encounter as dyadic, human interactions and role performances. The majority of the past studies on service encounter were limited to interpersonal interactions between the service employees and customers (Meuter et al., 2000).

However, Bitner (1992) recognises three types of service capes as self-services, interpersonal services and remote services. Meuter et al. (2000) identify self-service as a fundamental shift in the service context, while technology-based service interactions are viewed as the key in service transactions. Instead of the marketplace, the term 'market space' is receiving increased attention in today's service sector and is defined as "a virtual realm where products and services exist as digital information and can be delivered through information based channels" (Rayport & Sviokla, 1999:14). Self-service technologies are a classic example of market space transactions (Meuter et al., 2000).

Self-Service Technologies (SSTs) are defined as "technologies, provided by an organisation, specifically to enable customers to engage in self-service behaviours"

(Hilton & Hughes, 2013:3; Hilton et al., 2013:862). SSTs are also viewed as "technological interfaces which enable customers to produce the service independent of direct service employee intervention" (Meuter et al., 2000:50).

Advances in information technology and increased labour cost have influenced business organisations to transform their business processes to technologically incorporated advanced operations (Dabholkar, 1996). Further, the technological breakthrough is not limited to the internal business processes; it has spread to firm-customer interfaces through self-service technologies (Meuter et al., 2005:61). Therefore, SSTs can be viewed as a natural outcome of technological maturity (Castro et al., 2010). SSTs are widely accepted due to the transformation of business processes during the last ten years (Meuter et al., 2005), and now they are utilised in all businesses to perform tasks effectively with less efforts (Meuter & Bitner, 1998).

Many digital technologies offer a highly personalised environment to their customers with rich information and more interactivity (Parise et al., 2016). Now technology-based services are becoming an integral part of marketing (Verhoef et al., 2009), and growing numbers of customers are working with technologies to create their service outcomes rather than depending on the firm's employees (Meuter et al., 2000). Emerging new customers are known as 'working customers', and many of them are happy to serve other customers too, without being limited to serving themselves in the self-service options (Reider & Voss, 2010).

However, the introduction of SSTs does not ensure their acceptance by the customer, because some customers are indisposed to adopt SSTs (Liljander et al., 2006). When introducing technology to the service encounter, it is necessary to make sure whether the customer perceives an attractive experience or it detracts the overall service experience of the customer (Curran et al., 2003). Customers will not use SSTs if they perceive it as uncomfortable and not beneficial (Meuter et al., 2005).

Although tremendous growth is visible in practice, there has been a little exploration of consumer use of SSTs in academic research (Verhoef et al., 2009). The paucity of scholarly work in the SST context was highlighted by many researchers as; limited research attention to technological interfaces (Meuter et al., 2000), the shortage of the technology interface in service encounter research (Bitner et al., 2000; Parasuraman, 2000), consumer evaluations of self-service technology options (Dabholkar, 1996),

customer value co-creation in SSTs (Hilton et al., 2013) and customer experience at self-service technologies (Verhoef et al., 2009; Hilton & Hughes, 2013).

2.2.1.1 Growth of self-service technologies in services

Self-service technologies have modernised the service encounter by permitting the consumer to perform transactions through a technological interface without human contact from the firm (Meuter & Bitner, 1998; Verhoef et al., 2009). This evolution of technological interfaces has changed the way organisations manage interpersonal care in service premises by substituting it with another option called 'do it yourself', which has become a critical element in service operations (Ding et al., 2007:246). Self-service technologies are now the norm in the modern marketplace (Kelly et al., 2017) while 'automated social presence' is predicted in the near future, involving businesses engaging with customers on the social level as 'humanoid robots' by providing technology-based service frontline experiences. (van Doorn et al., 2017).

Self-service technologies provide an opportunity for customers to produce and consume service or parts of a service electronically without direct contact with the firm's employees. Due to technological advances and changing managerial mindsets, the roles of customers and firms are in continuous flux, and currently, there is a focus on creating more value, which is a prerequisite for becoming competitive (Saarijärvi et al., 2013). Bitner et al. (1997:197) recognise self-service options as an extreme where allow the customer to produce a full service with very little interference or support from organisational employees, as a 'full participator'. Online banking, automated airline ticketing, automated hotel checkouts, supermarket checkouts, self-check-in at airports, self-service fuel pumps, self-scanning at retail shops and automated teller machines (ATM) can be taken as examples (Meuter et al., 2000). Some self-service technologies have now become commonplace, such as self-fuel pumping and ATMs whereby around more than half of banking transactions now take place without the assistance of a teller (Meuter et al., 2000).

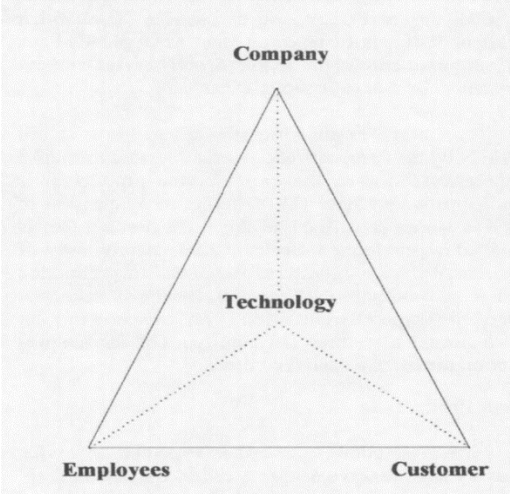
Currently, most businesses have accepted SSTs with the purpose of accomplishing more tasks with minimum effort, since clients act together with machines, converting their role from principally passive to active (Hilton et al., 2013). Although initially only routine and simple transactions were allowed via SSTs, now they are used in performing more complex non- routine work. Adequately designed service technology systems allow

relatively inexperienced people to perform very sophisticated tasks quickly (Quinn et al., 1990).

2.2.1.2 Classifications of self-service technologies

Introduction of technology into the business performance influences main three parties. Therefore, the triangle model of marketing, which was initially proposed by Kotler (1994), comprising endpoints of consumer, company and employees, has been extended to incorporate the role of technology by Parasuraman & Grewal (2000). The advanced service pyramid (figure 2.9) shows how technology as an intermediating factor influences the main three parties of the business.

Figure 2. 9: Service pyramid incorporating technology

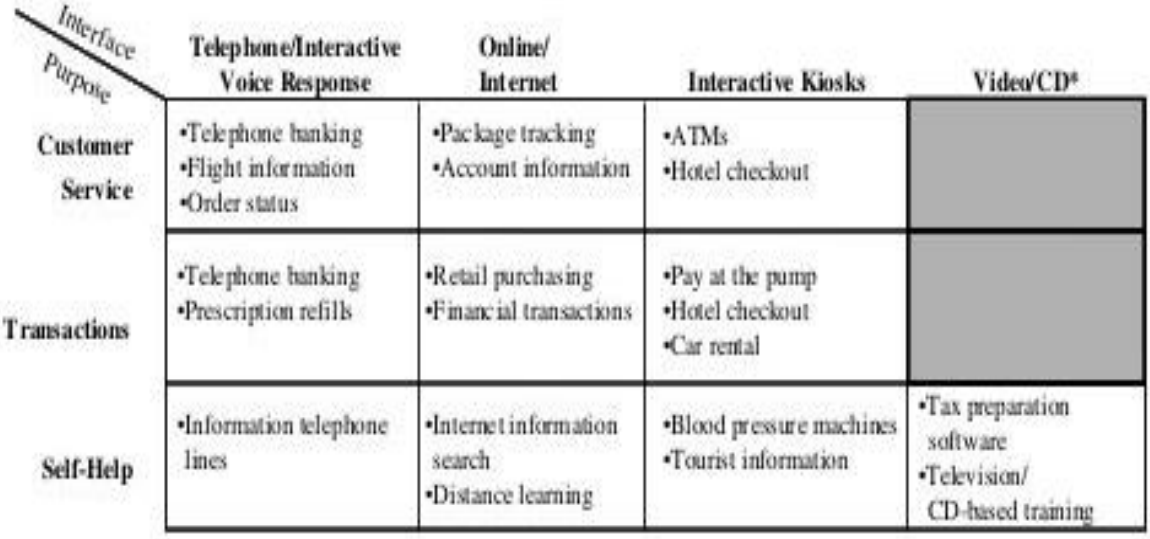


Source: Parasuraman & Grewal (2000:171)

Self-service technologies are categorised based on the channels, as electronic kiosks, the internet, telephone and mobile devices etc. (Castro et al., 2010). SSTs range from well-established traditional offerings to novel platforms such as flight check-in facilities (Kelly et al., 2017).

Meuter et al. (2000) classify self-service technologies into four primary types of technology interfaces as 1. telephone-based technologies and interactive voice response systems (IVR); 2. online connections and internet-based interfaces; 3. interactive kiosks; and 4. video or CD technologies. The study used this classification to understand customer frequency of usage of different types of self-service technologies. The following figure illustrates this classification.

Figure 2. 10: Classification of self-service technologies



Interface / Purpose	Telephone/Interactive Voice Response	Online/ Internet	Interactive Kiosks	Video/CD*
Customer Service	•Telephone banking •Flight information •Order status	•Package tracking •Account information	•ATMs •Hotel checkout	
Transactions	•Telephone banking •Prescription refills	•Retail purchasing •Financial transactions	•Pay at the pump •Hotel checkout •Car rental	
Self-Help	•Information telephone lines	•Internet information search •Distance learning	•Blood pressure machines •Tourist information	•Tax preparation software •Television/ CD-based training

Source: Meuter et al. (2000:52)

According to this classification, telephone-based technologies allow the customer to perform many service transactions over the telephone without physically visiting the service premises. Internet-based interfaces are cost-effective and open network (Afuah, 1998) that reducing constraints of distance and geographical barriers. They increase the flexibility of interactions (Sawhney et al., 2005) and provide avenues for virtual communities. Social media as internet-based applications allow collaborative value creation and among many social media, social network sites are the most popular today (See-To & Ho, 2014).

Interactive kiosks consist of technologies such as touchscreen displays, card readers, scanners, coin operations etc., and enable users to access information (e.g., account balance checking, flights), coin-operated cafeterias, managing airline reservations and check-in kiosks etc. Kiosks replace many of the small booths or workstations which were previously placed to provide routine tasks (Castro et al., 2010).

Firms are seeking to fulfil three kinds of business goals through self-service technologies, 1. Providing customer service, (answer questions regarding accounts, pay bills, tracking delivery times) 2. Enabling direct transactions (order, buy, exchange resources) 3. Self-help/ Education /learn and training the customers (Meuter et al., 2000:52). Managing account information, bill payments, package tracking and frequently asked questions can be taken as examples of customer services at SSTs. Online ordering, purchasing, resource

exchanging can be categorised as transactions at SSTs. Technology enabling learning, training and information gathering are examples of self-help.

2.2.1.3 Advantages and disadvantages of self-service technologies

Advanced technology provides service firms with many alternatives to the traditional service encounter through the provision of self-service technologies (Curran et al., 2003). Self-service technologies provide benefits to the customers and the firm as well.

Service providers are benefited with cost savings, mainly because customers perform service-related activities that otherwise would have been performed by the firm's employees (Ding et al., 2007). Apart from that, SSTs provide benefits such as increased efficiency, increased customer satisfaction and loyalty, standardization of service and differentiation through technology (Meuter & Bitner, 1998), increased speed of service delivery, opportunities for customization and precision (Berry, 1999), cost reduction and productivity etc (Dabholkar, 1996). Further, introducing SSTs into the service encounter allows organisations to handle varying demand conditions without adjusting the staff (Curran et al., 2003). Additionally, allowing the customer to produce the services in SSTs indirectly causes the service provider to focus on priorities through avoiding many clerical works, simple and routine tasks etc. (Castro et al., 2010).

On the other hand, customers are benefited by time-saving, cost-saving, greater control over service delivery, reduced waiting time, a higher level of customisation, locational benefits and enjoyment (Meuter & Bitner, 1998; Beatson et al., 2006). Customers enjoy SSTs due to the low-price advantage of self-service, convenience and greater control over service outcomes such as time or simple enjoyment of the task (Dabholkar, 1996; Hsieh, 2005). Efficiency, flexibility, spontaneous delight (Bitner et al., 2000), convenience and ease of use (Meuter et al., 2000) are also identified as benefits for the customer. SSTs create a more constant service environment, which facilitates the customer's precise understanding of the expected service (Curran et al., 2003). When customers use SSTs instead of interpersonal services, the success of service transactions give the customer feelings of accomplishment, enhanced self-efficacy, and enjoyment (Meuter et al., 2005). Some SSTs provide the service in a multilingual manner (e.g., kiosks at airports), so then customers can obtain the service while understanding it in the language most familiar to them (Castro et al., 2010). SSTs are user-friendly and provide more accessibility to people

with disabilities (e.g., online transactions) and potentially contributes to the national prosperity and quality of life of individuals (Castro et al., 2010).

Wei et al. (2017b) find the importance of extrinsic attributes (convenience, time-saving, efficiency) and intrinsic attributes (independence, accomplishment, confidence, novelty, enjoyment, empowerment, and engagement) of self-service technologies that provide customer satisfaction and a positive service experience. Further, they found that in particular extrinsic attributes are more significant in enhancing customer satisfaction with SSTs. 'Trust' is found to be the most vital element in building e-loyalty among Generation Y customers (Bilgihan, 2016). Nijssen et al. (2016) note that customer relational value is higher among individuals who are highly benefited with SSTs and experience low-cost attributions. SSTs can delight customers simply through giving them the credit for what they can accomplish by themselves (Meuter et al., 2000:69).

However, Mick & Fournier (1998) explain the possibility of simultaneously experiencing both positive and negative feelings towards new technologies. Some customers perceive SSTs as a threat, which causes anxiety (Mick & Fournier, 1998). Nijssen et al. (2016) found that less-benefited individuals (who are low in self-efficacy, education, etc.), reveal a damaging relationship with the firm. Technology failures and process failures have been identified as the major factors which result in customer complaining behaviour and dissatisfaction, which is higher in SSTs compared to interpersonal interfaces (Meuter et al., 2000).

Meuter & Bitner (1998) recognise six general concerns for a firm as potential disadvantages of SSTs: service recovery issues, reduced face-to-face interaction, an overemphasis on firm benefits, an overemphasis on technologically based competitive advantages, the limitations of social experience and lack of sufficient cost savings. Considering both successes and failures in traditional and technological interfaces, Thomas (2017) recommends 'hybrid services' in the customer service field combining technology innovations with human involvement in customer service approaches. Cunningham et al. (2008) differentiate among self-service technologies based on the avenues provided for customisation. Robertson et al. (2016) explore the influence of self-service technologies on customer satisfaction, giving special attention to 'interactive voice response (IVR) SST' and 'online SST'.

The advantages/benefits and disadvantages discussed in the literature resonate the positive and negative experiences of customers, and reasons to choose SSTs which are main components in this study. These are separately discussed in detail in the sections '2.2.1.7- customer acceptance of self-service technologies' and 2.3.5 -customer value co-creation experience.

2.2.1.4 Service-Dominant logic to understand the value co-creation in SSTs

Service-dominant logic, as the starting point of many value co-creation discussions, provides avenues for the possibility of value co-creation in technological interfaces. Lush et al. (2008) elaborate how value co-creation takes place in IT-based interfaces, providing a new lens to assess the customer experience and value co-creation in SSTs.

The 'full institutional perspective' of S-D logic (Vargo & Lusch, 2016) explains value co-creation through various institutional arrangements, such as the provision of advanced technologies as an 'institutional solution'. Vargo & Lusch (2016:19) explain how S-D logic views technology from a value co-creation viewpoint as follows:

> "Service-dominant logic addresses technology through the role of operant resources (primarily knowledge and skills) enhancing human viability, especially through the creation of new resources. This occurs through the integration of resources from a host of actors. Institutions enable the coordination, collaboration, and cooperation of these actors in the value creation process".

Further, they note that possible failures of such technologies, which can be considered as value co-destruction, which causes to diminish well-being as,

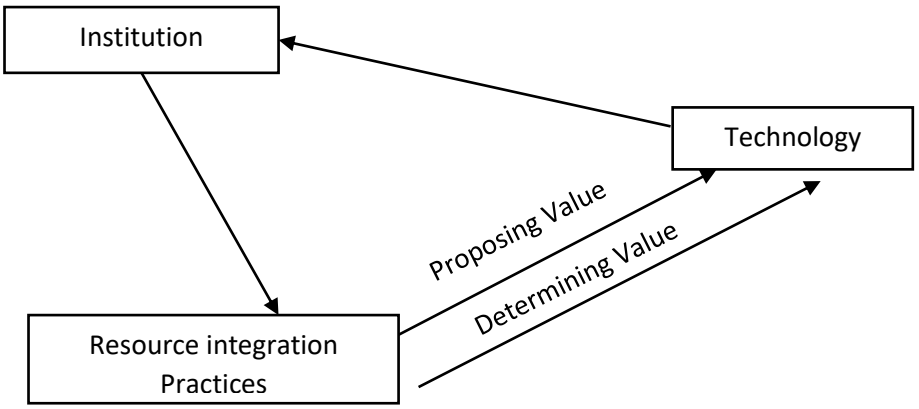
> "Institutions and operant resources can help to actualise the potentiality of technology, as well as hinder it".

FP 7 of S-D logic suggests that, "actors cannot deliver value but can participate in the creation and offering of value propositions" (Vargo & Lusch, 2016:18). Therefore, value propositions should be more compelling than those of competitors in order to achieve competitive advantages through innovative collaboration (Lusch et al., 2007), which meets the conditions for introducing technological interfaces such as SSTs.

Value co-creation in SSTs can be explained from the resource integration perspective. SSTs are recognised as operand resources which facilitate organisations to replace employees with potentially low-cost operant resources of customers (Hilton et al., 2013) who play a co-creating role as "partial employees" (Meuter & Bitner, 1998). Technologies have often been regarded as operand resources in literature (Barnes et al., 2009; Payne et al., 2009). Peñaloza & Mish (2011) note that in practice the separation between operant and operand resources as unclear. SSTs are necessarily integrating the operant resources of the customer with the operand resources provided by the service firm (Hilton & Hughes, 2013). SSTs allow operant resources to be embedded into operand resources (Lusch et al., 2007). Therefore, without being limited to operand resources, SSTs are working as a substitute for the tacit knowledge of employees, since it contains explicit knowledge which is essentially required to provide successful guidance on performance (Hughes et al., 2011). Technology can work as both operand and operant resources in certain circumstances (Kleinaltenkamp et al., 2012). Lusch et al. (2007) view IT as a bundle of operant resources with a function of facilitating service integration within the firm and throughout the whole value creation network, including customers. Kleinaltenkamp et al. (2012) identify technology as a 'resource integrator' which is capable of forging relationships with others using their embedded skills and knowledge.

Value co-creation from a service ecosystem perspective refers to the resource integration, as the central mechanism for connecting people and technology (Vargo & Akaka, 2012). Technology as a product of human action (an operand resource: one that requires action to be taken upon it to be useful) and as a medium of human action (an operant resource: one that is capable of influencing other resources as well) provides a new platform for value co-creation (Vargo & Akaka, 2012:213). Therefore, technology can be considered as a product as well as a process associated with multiple modes of collaboration. Vargo & Akaka (2012) use structuration model to explain the role of technology in value co-creation, stating that application of various technologies in value co-creation practices can potentially affect the ways of both determining and proposing value. From the service ecosystems perspective, technologies can be regarded as value propositions, since they represent a product of human action and are developed for a specific purpose and context (Vargo & Akaka, 2012). The role of technology in value co-creation is shown in the following figure.

Figure 2. 11: Technology in value co-creation



Source: Vargo & Akaka (2012:214)

Co-creation at technological interfaces was identified by Lusch et al. (2007:9), who argue that,

> "When a person uses an appliance, it is essentially collaborating with the producer of that good and using the knowledge of that producer".

Further, they state that customers' goal in using technologies in collaboration with the organisation is to reduce waste (time or effort) of the value-creation process.

Referring to above literature, this study views SSTs as an arrangement provided by organisations (Vargo & Lusch, 2016), take the forms of product as well as process (Vargo & Akaka, 2012) and offer a combination of both operand and operant resources (Kleinaltenkamp et al., 2012) to facilitate customer value co-creation process.

At the moment, value co-creation research work covers a wide range of service sectors. Tourism (Binkhorst & Den Dekker, 2009; Prebensen et al., 2014; Oyner & Korelina, 2016; Thyne & Hede, 2016; Johnson & Neuhofer, 2017; Jung & Dieck, 2017), the hotel sector (Chathoth et al., 2013; Higuchi & Yamanaka, 2017), healthcare (McColl-Kennedy et al., 2012; Kofi et al., 2015), retailing (Dennis et al., 2017), library service (Islam et al., 2015), sports (Witell et al., 2011; Woratschek et al., 2014; Horbel et al., 2016), branding (Schau et al., 2009; Choi et al., 2016; Ramaswamy & Ozcan, 2016; Shamim et al., 2016; Azad & Allahyari, 2017; Biraghi & Gambetti, 2017; Quach & Thaichon, 2017), travel and transport (Echeverri & Skalen, 2011; Grissemann & Stokburger-Sauer, 2012; Zatori, 2016; Okdinawati et al., 2017) are among them.

Even though, nowadays customers increasingly use technological interfaces to co-create value, attention given to understand value co-creation in technological interfaces is very rare (Hilton et al., 2013).

2.2.1.5 Value co-creation in self-service technologies

"Self-service has become more prominent in value co-creation between providers and customers as a result of the rapid emergence of technological innovations in the internet, mobile phones, and personal computer terminals" (Gebauer et al., 2010:516). Currently, customers receive a sense of empowerment with unlimited opportunities to access, communicate and engage with technologies in creating value (Hoyer et al., 2010). Yu & Sangiorgi (2017) note that provision of 'supporting tools' such as smart technologies can facilitate customer value co-creation by assisting them to apply their own skills and resources in value co-creation process.

The development of the World Wide Web has magnificently contributed towards the wider spread of self-service technology (Hilton et al., 2013), and multimedia-rich interactions on the internet make virtual co-creation a success (Füller et al., 2009). The internet is recognised as a great platform for customer engagement due to its inherent characteristics, such as interactivity, reachability, persistence, speed and flexibility (Sawhney et al., 2005). Networked organisations and virtual customer communities demonstrate high potential as drivers of value co-creation, including co-innovation (Romero & Molina, 2011). Virtual customer communities provide a promising value to the firm with the aspects of designing, marketing communication and overall brand experience (Romero & Molina, 2011). Online communities provide a vast range of opportunities for value co-creation (Cova & Paranque, 2012), in particular, B2C online brand communities create a context in which the technological encounter allows both brand decision-makers and consumers to join many ways, working as a relational tool (Gambetti & Graffigna, 2014). Ind & Coates (2013) point out the emergence of co-creation as a coincidence of several developments such as adoptions to internet technologies. Saarijärvi et al. (2013) clarify how resources are co-created in dyadic relationships, networks and service systems consisting people/ technology and value propositions acknowledging the role of technology.

Payne et al. (2008) note that customer value co-creation through self-service technologies creates unique experiences with the firm. Due to the convergence of open standards,

specialisation, connectivity and network ubiquity, all entities such as individuals, organisations and households find opportunities to do everything that they have previously done with the use of information technology (Lusch et al., 2007). This collaboration with IT provides avenues to reduce waste of time and effort in the value creation process.

Sawhney et al. (2005) map internet-based collaborative mechanisms in new product development processes, stating that the internet is a rising platform, enabling more customer involvement in product innovation. The Internet provides many advanced opportunities for business organisations to use consumers' 'innovative potential and knowledge' throughout the value chain (Kohler et al., 2011). Sandström et al. (2008) also view technology-based services as a new turning point in service development and illustrate the value-in-use of technology-based services, elaborating the opportunities given for value co-creation in websites. Zhang et al. (2018) outline customer engagement in online value co-creation as "co-creation through positively valenced engagement behaviors may occur when customers are delighted, feel valued, experience reciprocity, receive organizational incentives, are solicited for feedback, can count on service recovery efforts and interact with helpful, empathetic, polite and responsive employees".

Now customer co-creation demands 'smart offerings' which consist of more frozen knowledge (Etgar, 2008). Smart offerings are those which embed the know-how to products, which can significantly improve the co-creation capabilities of the customer. This interpretation reasonably matches with the self-service technologies which embed the skills and knowledge (operant resources) of the firm's employees to be much more interactive with the customer in the value co-creation process. Therefore, properly developed SSTs help even low skilled customers to perform their services with confidence (Michel et al., 2008). Payne et al. (2008:383) show how service encounters become 'action-supporting' by providing opportunities for customers to engage in activities such as 'trials, knowledge sharing, self-service etc.

Customer engagement with co-production through resource integration is the most prominent (Hilton & Hughes, 2013) and essential element in self-service technologies (Meuter et al., 2005). Customers operate on resources made available for them by providers, by other market actors or by themselves, to increase their well-being (Vargo et al., 2008). Hughes et al. (2011) broadly categorise customer resources as cognitive, attitudinal, relational, physical and material that are needed to perform successful SST

transactions. Apart from the materials needed by the customer (ICT hardware/software, credit/debit card), all other resources were grouped under the operant category. Refer to the table below in the text.

Table 2. 7: Resources needed for SST transactions

Resource type	**Examples**	
Cognitive	Functional knowledge, product or service knowledge	Customer operant resources
Attitudinal	Motivations, past behaviour and experience	
Relationship	Family, consumer tribe, commercial and professional	
Physical	Perceptive ability, strength, energy, dexterity	
Material	ICT hardware/software, credit/debit card	Operand resources

Source: Hughes et al. (2011:2)

Payne et al. (2009:383) state that encounters must be supported the co-creation process, enabling customers to engage in "trials, knowledge sharing, self-service activities etc. especially through creating ease of use mobile/pc interfaces". Grönroos & Ravald (2011) discuss self-service technologies as a medium of value co-creation, which results in time-saving and stress reduction.

Füller et al. (2011:261) identify opportunities for customer involvement in "online idea and design competitions, crowdsourcing platforms, and other forms of democratised innovation approaches" in co-creation. Dahan & Hauser (2002) note the opportunities for virtual customer involvement in product development. Anticipated or perceived benefits are the key to customer engagement in virtual customer environments which can be categorised as hedonic benefits, cognitive or learning benefits, social integrative benefits and personal integrative benefits (Nambisan & Baron, 2009). "Due to the cost-efficient and multimedia-rich interaction opportunities offered by the internet, virtual co-creation has become a suitable means of creating value" (Füller et al., 2009). Bonsu & Darmody (2008) explore co-creation in virtual technology context, highlighting the consumer empowerment in co-creation practices. Consumer value co-creation in hybrid service firms, which use both physical and virtual mediums in their value delivery were studied by Teo & Oh (2010), who considered information quality and service convenience as major consumer value determinants. Kelly et al. (2017) investigate the customer perspective on their roles in SST encounters and recognise six roles played by the customers in creating value, which can result in either positive or negative outcomes.

Kelly et al. (2017:11) investigate the customers' role of value co-creation in self-service technologies as a 'convenience seeker, motivated worker, judge, enforced worker, unskilled worker, and assistance provider'. They classify customer roles dichotomously as 'voluntary roles' and 'enforced roles', based on the dominance of the party. An 'enforced worker' is recognised as being excessively controlled by the service provider and 'forced' to perform some tasks in SSTs without their actual willingness, which finally causes failures, dissatisfaction and switching intentions. Therefore, customer experiences can be either positive or negative in relation to these customer roles.

As above literature shows, value co-creation in technological interfaces has been revealed in different contextual lenses, and mainly limited to specific service provisions. Therefore, many avenues are still existing to investigate, whether customers would prefer to co-create value in SSTs, what customers do in co-creating value and how they experience co-creation in self-service technologies, which are the prime objectives in this study.

2.2.1.6 Value co-destruction in self-service technologies

Parasuraman (2000) points out that there is evidence of increasing customer frustration when working with technology-based systems. Failures with technology, personal faults, and the combination of both are the main reasons for SST failures (Snellman & Vihtkari, 2003). The lack of regular personal interactions with customers in SSTs leads to poor understanding of the customers (Kristensson et al., 2008). Reider & Voss (2010) point out the lack of skills in performing in SSTs as a reason for avoidance of them, which may cause additional expenditure and time consumption or otherwise dependence on others. Zhang et al. (2018) identify online value co-destruction as "co-destruction through negatively valenced engagement behaviors emerges from rude employee behaviors, indifference, confrontation with company representatives, technological failure, the lack of complaint outlets and customers' desire for revenge".

Featherman & Hajli (2016) found risks associated with SSTs while Hanks et al. (2016) found that people are reluctant to perform some tasks (donations) when it is solicited via SSTs. Service failures in online retailing were recognised as; problems with deliveries, website designs, customer service problems, payment problems and security issues (Holloway & Beatty, 2003). A potential hazard was recognised with self-service technologies in building customer loyalty which may result in weakening the social bonds

(Selnes & Hansen, 2001). Fernandez-Sabiote & Roman (2016) found that customers are more happy with traditional channels than deriving the service via online/company websites in multichannel financial services firms.

Fan et al. (2016) found that consumer reactions to SST failures vary depending on the degree of anthropomorphism associated with an SST machine, the individual's sense of power and the presence of other customers. There is potential for less blame for service firms in situations of service failures at self-service technologies, since the customer is taking responsibility for the transactions (Bendapudi & Leone, 2003; Harris et al., 2006).

Although use of the term 'value co-destruction' is rare, previous research work has reported many reasons for failures which take place when customers interact with SSTs. Similarly, this study explores customer value co-destruction in self-service technologies, especially understanding failures in SST performance, when customers accomplishing value creation activities.

2.2.1.7 Customer acceptance of self-service technologies

Even though the firm derives short-term value, forcing all customers to accept self-service technologies might result in value co destruction (Ple & Cáceres, 2010). Therefore, the firm should have a thorough understanding of the extent of customer acceptance of self-service technologies. Although attention to customer value co-creation intention in self-service technologies is new, a fair amount of previous research work is available in similar contexts such as acceptance/trial/adoption of technologies/SSTs. Most of this research used general technological acceptance models such as the Technology Acceptance Model (TAM) or Unified Theory of Technology Acceptance and Use (UTAUT), even though they do not properly explain the self-service technology context (Blut et al., 2016). Apart from that, few studies particularly recognise the SST acceptance using different measurements. However, recently, Blut et al. (2016) developed a model for SST acceptance by conducting a meta-analysis using TAM, UTAUT and Innovation Diffusion theory (IDT) as the main sources.

TAM was introduced by Davis in 1985, mainly relying on Theory of Reasoned Action and Theory of Planned Behaviour. The TAM has been continuously upgraded as TAM 2 (Venkatesh & Davis, 2000) and TAM 3 (Venkatesh & Bala, 2008) by providing matching dimensions to the context of e-commerce, including trust and perceived risk of system

use. TAM is primarily an information systems theory that models how users come to accept and use technology. The model suggests that when users are presented with a new technology, some factors influence their decision on how and when they will use it, notably, 'Perceived usefulness' and 'Perceived ease-of-use' (Venkatesh & Bala, 2008:277). Oh et al. (2016) view that TAM is not adequate to understand SST adoption, and therefore added two variables, namely 'situational factors' (waiting, service complexity) and 'attitudinal variables' (technology trust and technology anxiety) and find significant effects. Lee (2016) notes that TAM produces inconsistent results in different cultural settings (e.g. western versus non-western), and therefore challenged its applicability in different cultural contexts. Therefore, Weijters et al. (2007), Lee (2016), Pikkarainen et al. (2004) use some extensions to TAM to measure SST acceptance. Oh et al. (2016) recommend essential additions to TAM especially including some 'non-technology' variables, which are important in individual's technology acceptance. Blut et al. (2016) recognise that TAM is not properly explaining the SST acceptance.

Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology (UTAUT) model with four core variables: performance expectancy, effort expectancy, social influence, and facilitating conditions and four moderating variables: gender, age, experience, and voluntariness of use, to understand intention to use and actual use of technologies. Blut et al. (2016) note that general technological acceptance models; mainly TAM and UTAUT are not adequately explained the self-service technology context.

Apart from these established technological acceptance models, which have been used in previous research work to understand both general technology acceptance and SSTs in specific, some scholars attempted to introduce several individual measurements to understand trial/ acceptance/ intention/ use of self-service technologies as discussed below.

Meuter et al. (2005:63) argue that the literature in understanding "why customers decide to try SSTs" are rare, calling a need for recognising factors which sufficiently explain the SST context. They find the importance of 'innovative characteristics of SSTs' and 'individual difference' on SST trials. Both 'consumer contexts' (their skills, experience, social and psychological factors) and 'organisational contexts' (features of the interface, speed, control, reliability) are recognised as important in customer choice of SSTs (Hilton et al., 2013).

Liljander et al. (2006) explore **technological readiness** (TR) in SST acceptance and find different levels of technological readiness between the users and non-users of SSTs. Lin and Hsieh (2005) find the influence of technological readiness on behavioural intentions and customer satisfaction in the self-service technologies while Lin & Hsieh (2007) find the influence of TR on both satisfaction and behavioural intentions in SSTs.

A negative effect of user's **technology anxiety** on their use and evaluations of self-service technologies was identified in literature (Meuter et al., 2003). Wang et al. (2016) found that individuals' anxiety and lack of trust towards technology cause unwillingness to use SSTs and dissatisfaction.

Need for interaction with the service employee causes a negative disposition towards SSTs (Dabholkar, 1996). Lee (2017) confirms an inverse relationship between need for interaction with service employees and intention to use SSTs. Further, Anton (2000) view customers are generally seeking more human interactions during the service encounter, also would negatively effect on SSTs.

Wang et al. (2012) explore the role of **situational influences** in the customer choice of SSTs, especially self-scanning at supermarket stores. According to their findings, 'perceived waiting time at the queue, perceived complexity of the task and the influence of companions' are the influential situational factors on customer choice between SSTs and interpersonal service. Demoulin & Djelassi (2016) also finds the influence of situational factors (time pressure, basket size, coupons and queue length at the SSTs and staffed checkouts) on actual customer usage of SSTs.

Habit and experience of similar technology have also been found as significant in SST adoption (Demoulin & Djelassi, 2016). Wang et al. (2017) identify prior habit as the most powerful precursor on SST usage, while Castro et al. (2010) argue that previous experience in using SSTs is crucial when the technology is new.

Influences of **personal control** on the adoption of self-service technologies was recognised by Lee & Allaway (2002). Level of perceived empowerment and enjoyment were identified as factors with strong influence on customers willingness to engage in online value co-creation (Füller et al., 2009).

Customer attitude towards SSTs are found as important in self-service technology adoption (Dabholkar & Bagozzi, 2002; Curran & Meuter, 2005). The SST Attitude-

Intention Model (Curran et al., 2003), explains the influence of multiple attitudes of SSTs on customer's behavioural intention on selecting SSTs. Lee & Lyu (2016) find 'personal values' and 'consumer traits' as important in determining the intentions to use SSTs via building attitudes. Wu et al. (2017) find e-servicescape dimensions having significant impacts on consumer attitudes and trust toward websites.

Importance of **service quality** in SST context is found by Dabholkar (1996) and confirmed by several researchers (Bauer et al., 2005; Shamdasani et al., 2008; Lin & Hsieh, 2011; Considine & Cormican, 2016) as important in SST adoption.

Dean (2008) finds **consumer demographics**, especially age effects on SST use such that older generation have less experience with SSTs and therefore, less confidence in performing via SSTs. Eriksson & Nilsson (2007) find that consumer demographics are insignificant in developed markets. However, nonsignificant impact of age on the use of SSTs was found by Dabholkar et al. (2003) and Weijters et al. (2007). Proving the same, Blut et al. (2016) found that age and gender as not effective predictors of SST acceptance. However, a significant effect of gender on intention to use self-service technologies are found by Elliott & Hall (2005).

Additionally, **characteristics of technology** such as simplicity of use, time convenience, place convenience, security, standardization of equipment, availability of technology, efficiency and average competence are recognised as encouraging customer use of self-service technologies while habit, preference, fear and absence of sufficient benefits discouraging the use of SSTs (Marr & Prendergast, 1993). The effect of perceived usefulness and multichannel satisfaction (Eriksson & Nilsson, 2007), innovation characteristics (Lee et al., 2003), cost savings, time-saving and behavioural control (Ding et al., 2007), individuals' capacity, perceived risk, relative advantage, desire for personal contacts and personal back up (Walker & Johnson, 2006), willingness and ability (Hilton et al., 2012) have also been recognized as important. Additionally, well-designed interface, accessibility, support of employees, store promotion and fast delivery were recognised as important in retail kiosks (Cho & Fiorito, 2010). Picot-Coupey et al. (2016) found the challenges e-retailers confronted when enhancing the customer shopping experience by synchronising clicks with bricks.

Recognizing the inappropriateness of general technological acceptance models in explaining the self-service technology context, and unavailability of a comprehensive

model, this study decided to explore factors which influence customer value co-creation intention in self-service technologies through a qualitative research. However, simultaneously, Blut et al. (2016) developed a model specifically to explain the acceptance of SSTs, using a meta-analysis of general technology acceptance models. This model consists of subjective norm, experience, need for interaction, self-efficacy, external control, anxiety and computer playfulness which affect the customer ease of use and usefulness, attitude towards using, usage intention and finally the use behaviour.

The risk of transferring to SSTs without understanding the perspectives of people, including both organisational employees and customers is recognised as critical (Hilton et al., 2013). Curran & Meuter (2007) contend that adoption of SSTs is a shift in consumer behavioural patterns and therefore firms should encourage customers to use SSTs by providing justifications.

It can be seen from the above reviews that, while researchers have studied factors influencing adoptions of SSTs extensively, these work diverse in terms of contexts and th factors investigated. Since a comprehesive understanding, especially on customer intention of colloborating with self service technologies in value creation is still elusive, this study aims to explotre customer value co-creation intetnion in self service technolgies.

CHAPTER TWO - SECTION THREE

CUSTOMER EXPERIENCE

2.3.1 Introduction

This section expounds the concept, 'customer experience', discussing the development of the concept, various definitions, the holistic view of customer experience, the multidimensionality of the concept, measurements of customer experience in scholarly work and especially the value co-creation experience of customers. This study uses the concept 'total customer experience' including both functional and emotional elements of experiences, in understanding the customer value co-creation experience in self-service technologies.

2.3.2 Evolution of the customer experience concept

Holbrook & Hirschman (1982) are credited with putting forward the concept of 'customer experience' in the consumer behaviour literature, emphasising the experiential view of consumption behaviour. Despite Holbrook's initial discussions, the concept of customer experience became more relevant to the field in the late 1990s, especially with the scholarly work of Pine & Gilmore (1999). Their paper titled 'Welcome to the experience economy', explains the evolution of the economy over the centuries, in the nineteenth century from thr 'commodity economy' to the 'manufacturing economy', in the twentieth century to the 'service economy' and now in the twenty-first century to the 'experience economy'(Pine & Gilmore, 1999). With these movements, the focus of the economy also has moved from agrarian to industrial, service and finally to provision of memorable customer experiences in the current experience economy. Further, their study explains the characteristics of customer experience, based on two major dimensions; 1. customer participation (passive and active) and 2. Connection/environmental relationship (absorption and immersion). In active customer participation, customers play a central role in 'creating the performance or event that yields the experience' (Pine & Gilmore, 1999:101) which links with the phenomenon of 'value co-creation in this study. Schmitt (1999) scholarly work on customer experience is also an immense contribution to starting to understand the importance of customer experiences.

2.3.3 Definitions of customer experiences

Schmitt & Zarantonello (2013:28) outline the definitions of experience given by Webster's International Dictionary as, 1. ''direct observation of or participation in events: an encountering, undergoing, or living through things in general as they take place in the course of time",2. "knowledge and accumulated experiences over time", 3.''knowledge, skill, or practice derived from direct observation of or participation in events: practical wisdom resulting from what one has encountered, undergone, or lived.''

The above definitions of course are not specifically customer related. Scholars, however, have attempted to define customer experience as a distinct concept. Klaus et al. (2013:509) view customer experience as "the customer's cognitive and effective assessment of all direct and indirect encounter with the firm with relevant to purchasing behaviour". Pine & Gilmore (1999:99) explain experience as a subjective phenomenon that is "inherently personal, existing only in the minds of and the individual who has been engaged in an emotional, physical, intellectual or even spiritual level. Thus no two people can have same experience". Lipkin (2016:679) see the formation of customer experience as "realised through intermediation between the individual and the context' and moulded from a more 'actor-related' and often 'abstract, contextual perspective."

Sundbo & Darmer (2008) outline customer experience as the customer's direct and indirect experience of the service process, the organisation and the facilities and how the customer interacts with the service firm's representatives and other customers. Shaw (2007:8) outlines customer experience as "an interaction between an organisation and a customer. It is a blend of an organisation's physical performance, the senses stimulated and emotions evoked, each intuitively measured against customer expectations across all moments of contact". Lemon & Verhoef (2016:71) define customer experience as a "multidimensional construct focusing on a customer's cognitive, emotional, behavioural, sensorial, and social responses to a firm's offerings during the customer's entire purchase journey".

Customer experience is said to be the best predictor of customer loyalty and becoming a "big thing" in marketing (Maklan et al., 2017). Therefore, customer experience is not a marketing exercise alone (Gilmore & Pine, 2002), but is a seemingly complex concept that has been applied in various contexts (Homburg et al., 2015). Acquisition of the product or service itself is not necessarily the aim of the customer, instead, they want to

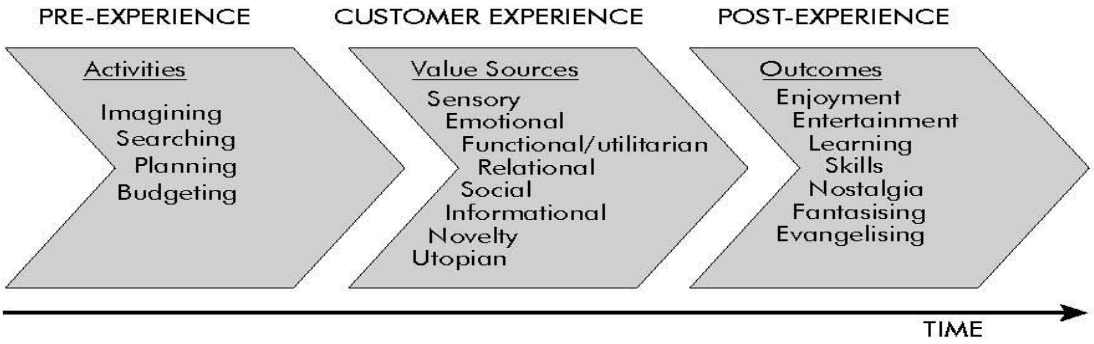
make their every purchase an 'experiential process' (Yoon & Lee, 2017). Therefore, it is worthy to understand the holistic view of customer experience.

2.3.4 Holistic view and multidimensionality of customer experience

Schmitt & Zarantonello (2013), view 'experience' as the broadest and most general research area in marketing, which provides broad-based frameworks and orientations. They recognise major research areas in this category as consumer experience, product and/or service experience, off-line and online experience, consumption experience, and brand experiences. Among them, recently, the 'service experience' has been found to be vital in the marketing literature and recognised mainly from the 'process-based', 'outcome-based' and phenomenological perspectives (Helkkula et al., 2012:556).

In an attempt to understand more clearly the nature of the customer experience and its implications, researchers have developed a number of frameworks in which they identify various components or dimensions of the experience. Verhoef et al. (2009) stress the notion that the customer experience should encompass the entire experience, including the search, purchase, consumption and after sale phases of the experience. Tynan et al. (2010) explain the stages of customer experience as pre-experience, experience and post experience as depicts in the following figure.

Figure 2. 12: Stages in customer experience



Source: Tynan et al. (2010:509)

Similarly, Arnould et al. (2004), classify consumption interactions as, 'anticipated consumption' (searching, planning for future purchases, daydreaming, budgeting, fantasizing), 'purchase experience' (choice, payment, bundling product, service encounter, and atmospherics), 'consumption experiences' (sensory experiences, satiation, satisfaction/dissatisfaction, arousal/flow, and transformation) and 'remembered

consumption experiences' (nostalgic ways by telling stories, comparing old and new times, talking with friends of days gone by etc). Carù & Cova (2015) note that the consumption experience is no longer limited to pre-purchase activities (stimulating a need, searching for information, evaluations) or to post-purchase activities (satisfaction assessment) but includes a series of other activities that influence consumer decisions and future actions. Voorhees et al. (2017) point out the requirement of understanding the all-inclusive service experience covering all possible service encounters, including pre-core service encounter, core service encounter, and post-core service encounter.

Lemon & Verhoef (2016:76) recognise customer experience as a 'customer's journey', going through the stages in purchase cycle moving through different various touch points in pre-purchase, purchase, and post-purchase stages. Managing customer touch points is a key issue in consumer experience management (Schmitt & Zarantonello, 2013). Meyer & Schwager (2007:3) define touch points broadly as "instances of contact either with the product or service itself or with representations of it by the company or some third party, including other customers". Rawson et al. (2013) note that organisations should work towards optimising positive customer experiences throughout all these possible contact points. Homburg et al. (2015) show the importance of establishing 'touch point journeys' across pre-purchase, purchase and post-purchase situations while Ponsignon et al. (2017) note the importance of proper designing the elements customer experience including customer touchpoints, customer journey, physical elements and social elements, in order to support the customer to realise the core experience. Stein & Ramaseshan (2016) disclose seven different elements of customer touch-points: atmospheric, technological, communicative, process, employee-customer interaction, customer-customer interaction and product interaction elements. However, this study focusses on understanding the technological interfaces, particularly SSTs which is widely spreading customer touch point in services.

In a slightly different conceptualisation, some authors reflected this in the term 'Total Customer Experience' (TCE). Berry et al. (2002b) outline TCE as, the experiences attached to both functional and emotional nature of the product/service. Oswald et al. (2006:399) define TCE as " a right blend of both physical and emotional elements along all the stages of the customer experience and value chain, that is, all moments of customer contact with the producer". Sandström et al. (2008) specifically explain 'total technology-based service experience' highlighting the importance of both functional and emotional

experiences. Lemon & Verhoef (2016) recognise the total customer experience as a dynamic process, since customers now use diverse platforms to interact with the organisation.

Schmitt (1999) proposes a five dimensional conceptualisation of customer experience that can be exploited in marketing. Gentile et al. (2007); Brun et al. (2017) used these dimensions to understand customer experience in different capacities. These dimensions of customer experiences focus on elaborating how customers 'sense, feel, think, act and relate' their experiences, which can be used by the business organisations as marketing strategies to provide superior customer experiences. These five dimensions as follows:

- Sensory experience/Sense marketing appeals (sight, sound, touch, taste, smell)
- Affective experience /Feel marketing appeals (joy, pride, happiness, moods, feelings and emotional experiences)
- Creative cognitive experience /Think marketing (intellect to deliver cognitive problem-solving experience)
- Physical experience/Act marketing (physical behaviours, lifestyles, interactions)
- Social identity experiences /Relate marketing (social esteem, being part of the subculture, brand community (Schmitt, 1999:13-15).

Adapting Schmitt's conceptual model of customer experience management, Gentile et al. (2007:398) recognise six components of customer experiences: sensorial component, emotional component**,** cognitive component**,** pragmatic component, lifestyle component and relational component**.** Nambisan & Watt (2011) use four dimensions to understand customer experiences in online communities as pragmatic experiences, hedonic experiences, sociability experience, and usability experiences. Keiningham et al. (2015); Keiningham et al. (2017) use cognitive, emotional, physical, sensorial and social experience dimensions in understanding the customer experience. Rose et al. (2011) recognise cognitive and affective states of experiences while Yang et al. (2017) and Xie et al. (2017) view sensory experience, affective experience, intellectual experience and behavioural experience as the dimensions of brand experience.

Berry & Carbone (2007) use these dimensional views of experience to derive implications to businesses. They disclose a practical problem of managing customer emotions of experiences and therefore suggest managing, functional (technical quality of the offering), mechanic (reliability of the service), and human (behaviours and appearances

of the service provider) clues focusing their impact in creating customer positive emotions, attitudes and behaviours. The importance of managing 'experiential clues' through handling 'performance clue', 'context-based clues', 'mechanics' and 'humanists' were also pointed out by Carbone & Haeckel (1994).

From the above frameworks, it can be seen that customer experience is a complex construct encompassing multiple components. This in turn has implications for the management of customer experience which must similarly be multi-faceted. As literature suggests, it is worthwhile to investigate the nature of the customer experience from a holistic perspective in order to obtain a rich understanding. This study therefore uses the 'total customer experience' perspective to investigate customer functional and emotional elements of value co-creation experiences in self-service technologies.

Lemon & Verhoef (2016:71) recognise that customer experience research is progressing through different steps, with a current focus on 'customer engagement' which is commonly termed as the value- co-creation experience, discussed next.

2.3.5 Customer value co-creation experience

The customer co-creation experience is unique to each individual, since it results from his or her interactions with the co-creation system (Füller & Matzler, 2007). Various authors have identified the individual's experience of co-creating, as 'co-creation experience' or 'experience co-creation' etc (Binkhorst & Den Dekker, 2009:312).

S-D logic addresses the outcomes of value creation processes as the 'value-in-use'. 'Value in use' is typically identified by the beneficiary in his/her individual lifeworld, uniquely and phenomenologically (FP10). The way value-in-use is highlighted by Vargo & Lusch (2008b) is very close to how beneficiaries' co-creation experience (Gummerus, 2013:29).

Cova & Dalli (2009:319) recognise the link between customer collaboration in the service encounter and their experience as "consumers who are co-opted into the production of (their) services feel involved and develop positive affective evaluations of both the service and the company and, hence, increase their loyalty, willingness to buy". Similarly, Gummerus (2013:32) views service experience as a link between the value co-creation process and value outcomes, stating that "experience is the missing link and the common denominator of value co-creation process and value outcomes".

Four types of customer co-creation experience in virtual environments have been discussed, as ‘pragmatic experience, sociability experience, usability experience and hedonic experience’ (Kohler et al., 2011). Pragmatic experience is fulfilled by offering product related information and details about underlying technologies, while providing opportunities for customers to perceive themselves as partners of the community provides sociability experience. Quality of the computer-customer interactions ensures the usability experience and pleasure, enjoyment, entertainment and mental relaxation confirm the hedonic experience (Kohler et al., 2011).

Dennis et al. (2017) explore customer value co-creation experience in online and offline retail shopping using ‘hedonic’ and ‘utilitarian’ elements, and unexpectedly they did not find any notable differences in co-creation experience between traditional and online channels. Zhang et al. (2017) describe co-creative customer experience in online brand communities using three dimensions: social support (informational support and emotional support), social presence, and flow and found positive associations between experience and customer engagement.

While the above studies focus in the nature and components of the co-creation experience, other research focuses more on the implications for businesses, in terms of encouraging customers to participating in co-creation. Accordingly, Lee et al. (2017) note that customer experience is at the core of the tourism industry, recognising the importance of employee’s role in stimulating customer willingness to co-create value. Kim & Choi (2016) found that augmenting customer experience quality is vital to encourage citizenship behaviours in service settings. Cubillas et al. (2017) identify that customer faithfulness can be improved by allowing them to engage with co-creation while Wiltshier & Clarke (2017) outline the necessity of understanding customer experience including both pre and post stages. Khodadadi et al. (2016) found the influence of ‘trust, interaction, perceived usefulness, action, information credibility, and relating’ on customers' experience in electronic stores. Shin et al. (2017) point out the importance of providing superior customer experiences by emphasising more on ‘proactive customer interactions' to prevent service failures than recovering after occurs.

Experiences/benefits are recognized as the value outcomes (in-use). Value as ‘benefits/sacrifices’ determines the utility of a product or service, and ‘value as experience’ determines its ‘hedonic and utilitarian values’ or ‘functional and emotional experience’ or ‘extrinsic versus intrinsic values’ (Gummerus, 2013). According to this

body of knowledge, consumers create the meanings associated with such experiences and activate the resources that the market provides to co-create their experiences (Arnould et al., 2005).

This study examines customer value co-creation experience as the outcomes of their value co-creation process in self-service technologies, elaborating their functional and emotional elements of experiences.

2.3.6 Common deficiencies in the customer experience literature

Although customer experience research work was established decades ago, despite the recognition of the importance of customer experience by practitioners, the academic marketing literature investigating this topic has been limited (Verhoef et al., 2009; Carù & Cova, 2015). Similarly, deficiency of comprehensive research work on customer experience context was identified, although it is prominent in marketing practice (Johnston & Kong, 2011:5; Schmitt & Zarantonello, 2013). Further, Verhoef et al. (2009) note that the focus of the studies was more on managerial implications of customer experience than identifying its antecedents and outcomes from the customer perspective.

Previous studies on customer experience have generally been recognised as limited to either purchase or consumption experiences, rather than taking a holistic view. Further, in today's experience economy, the research trend is focusing more towards on emotional view of experiences and a need for studies on 'total customer experience' has been identified as a fruitful avenue for service augmentation (Oswald et al., 2006; Verhoef et al., 2009).

Lack of integration of 'customer experience' with other relevant concepts in the marketing is viewed as another limitation of former studies (Homburg et al., 2015). The majority of the past studies have investigated the customer experience as a separate piece of work, rather than integrating it with other concepts and presenting them on a single platform (Verhoef et al., 2009). Brakus et al. (2009) and Schmitt & Zarantonello (2013) point out the limited application of customer experience research work to different specific areas leads to experience issues being understood very narrowly within each area than studying the experience holistically.

Addressing these gaps, this study examines the 'total customer experience', elaborating both functional and emotional experience elements. Further, the study connects this

concept with ‘value co-creation’ in self-service technologies, as an outcome of customers’ value co-creation process, aiming at developing a comprehensive model which explains customer value co-creation intention, practices and experiences in a single platform.

2.4 Chapter summary

This chapter reviewed the literature related to main three study areas; value co-creation, self-service technologies and customer experience in separate subsections. The section A was devoted to value co-creation literature and recognised the evolution of the concept, its theoretical bases, practical understandings and gaps in the history of scholarly discussions. Value co-destruction was also elaborated referring to possible failures of the value co-creation process. Further, the practice theory was discussed as the theoretical foundation for understanding customer value co-creation practices.

Section B developed the understanding on self-service technologies, especially as a technological interface in customer value co-creation. Section C built upon the customer experience, particularly recognising customer value co-creation experience form the ‘total customer experience’ perspective, by exploring both functional and emotional elements of the experience.

Following the discussions of these conceptual foundations for the present study, the next chapter explains the methodology employed in order to address these issues empirically and so answer the research questions.

CHAPTER THREE

METHODOLOGY

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

After reviewing the available literature on the three main study areas; value co-creation, self-service technologies and customer experiences, this chapter moves to explicate the methodology of the study.

Accordingly, this chapter comprises five sections. **Section-1** commences by identifying the appropriate philosophical foundation for the study, justifying the relevance of 'critical realism'. **Section-2** focuses on discussing the methodology of this study in general. It explains the rationale for the use of a mixed method approach, with a 'sequential exploratory design', elaborating the purpose of the research design, research approach, data collection and analysis methods and relevant ethical considerations.

As the mixed methodology consists of two separate approaches for sampling, data collection, analysis etc., for its qualitative and quantitative methods, this report allocates separate sections to describe the qualitative research design and quantitative research design of the study. Further, since this study follows a 'sequential exploratory design', in which the development of the quantitative study is based on the findings of the qualitative study, the qualitative research findings are provided before discussing the quantitative study design.

Accordingly, **Section-3** expounds the qualitative study design, including the purpose of conducting the qualitative study, qualitative data collection procedure, recruitment of the participants, the data analysis procedure and the steps for ensuring the credibility and trustworthiness of the study.

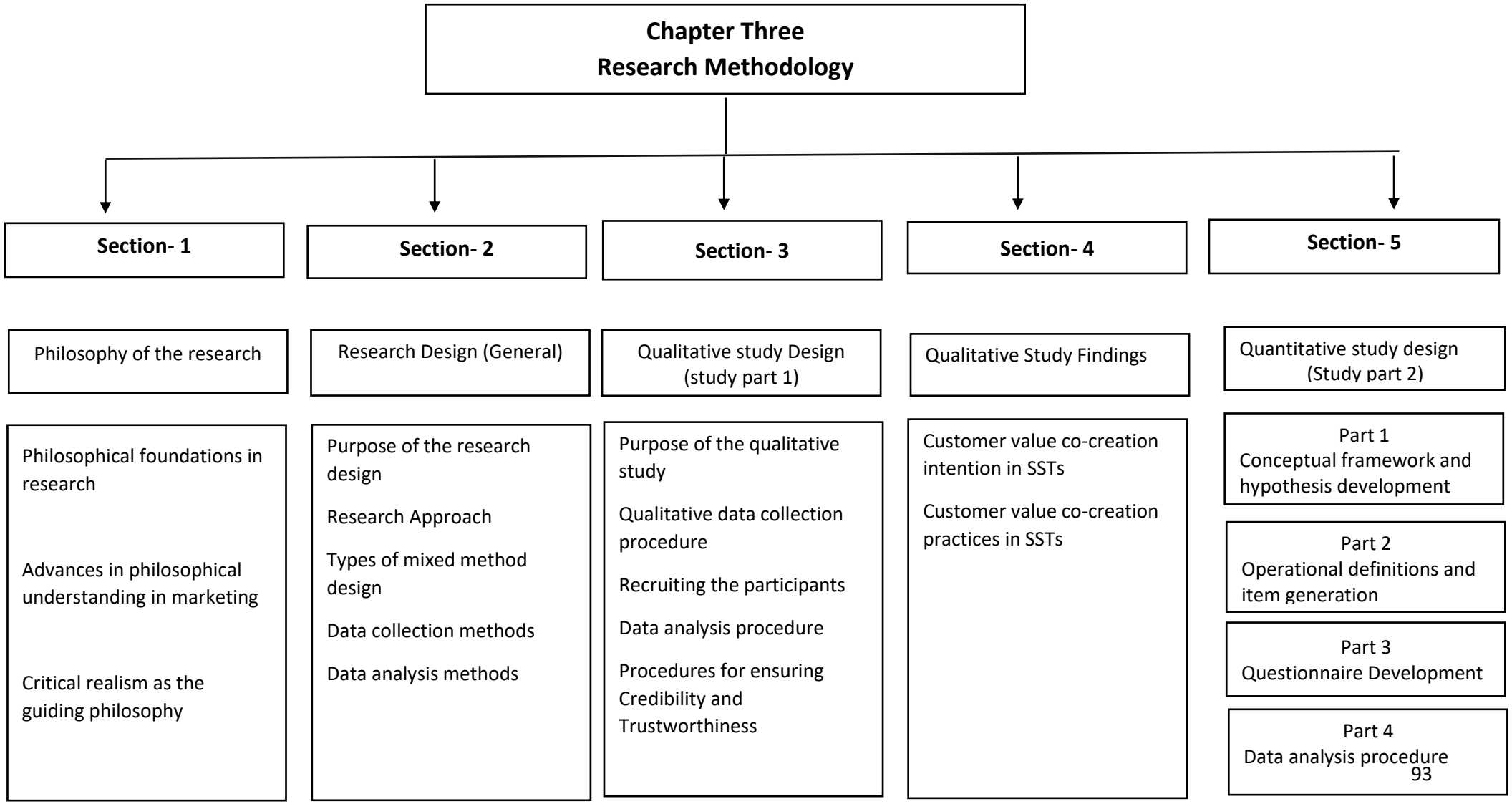
Section-4 reports the findings of the qualitative research under two main titles: customer value co-creation intention in self-service technologies and the customer value co-creation practices in SSTs, including the co-destruction. The next stage of designing the quantitative study is fundamentally based on the qualitative research findings.

Section-5 focuses on describing the quantitative study design, unfolding general matters such as the purpose of the quantitative study, type of data and collection methods,

sampling procedure, ethical background of the study etc. Separate subsections are allocated to describe special aspects such as Part 1 - Conceptual framework and hypothesis development, Part 2- Operational definitions and item generation, Part 3- Questionnaire development and Part 4, the quantitative data analysis procedure. The chapter ends with a summary of the research methodology.

The following figure visually illustrates the organisation of the Chapter Three.

Figure 3. 1: Organization of the Chapter Three



CHAPTER THREE - SECTION ONE

PHILOSOPHICAL FOUNDATION OF THE STUDY

3.1.1 Philosophical foundations in research

Every research work has an underlying philosophical foundation (Hunt, 1991). Each researcher needs to determine; what entities exist in reality (ontological assumptions), which research design is applicable (methodological assumptions), which criteria are suitable to evaluate knowledge claims (epistemological assumptions) (Hunt & Hansen, 2008) and how values influence the research process (axiological assumptions) (Saunders et al., 2009). Philosophy refers to sets of beliefs and assumptions about the development of knowledge (Saunders et al., 2009), termed paradigms, and these paradigms differ in their stance on the above mentioned ontological, epistemological and methodological assumptions. Knowledge on diverse philosophical stances provides confidence for researchers to argue for different research approaches and choose their philosophical foundation (Dobson, 2001).

Understanding the philosophical stance in research is important in three main ways: (Easterby-Smith et al., 2011):

- it helps to locate an appropriate research design
- it allows the researcher to recognise effective methods of analysis
- it permits the researcher to understand the other possible designs and approaches

3.1.2 Advances in philosophical understanding in marketing

In the 1950s and 1960s, the focus in marketing research moved from descriptive and qualitative orientation to one, which pursued rigour and quantification to find the 'universal truth' based on the philosophical justifications of positivism (Easton, 2002:103). 'Positivism' is particularly related to the natural science and is concerned with investigating an observable social reality to produce 'law-like generalisations'. It considers that the only reliable knowledge is scientific knowledge, which can only be created through objective approaches by positive confirmation of theories using scientific methods. Positivists take the view that "reality is separate from the individual who observes it, and considers the subject (the researcher) and object (the research phenomena)

are two separate independent things" (Weber, 2004:5). In contrast, 'Interpretivism' emphasises that individuals are unlike physical entities, since they generate meanings (Kelemen & Rumens, 2008) and assume that reality and the individual who observes it cannot be separated (Weber, 2004).

However, these two philosophies, positivism and interpretivism, have been criticised for having theory-practice discrepancies between researchers' ontological assumptions and their research practice (Smith, 2006). In attempting to solve this issue, the concept 'truth' received much attention, and marketing researchers also started questioning the role of truth in research work (Hunt, 1991). Against this background, 'relativism' and 'realism' appeared as alternative philosophies (Peter, 1992). However, relativism is identified as unacceptable, because it leads to the conclusion that all knowledge claims that the researcher makes are relative to something else or equally good, bad, right, wrong, ethical, unethical etc. (Hunt & Hansen, 2008). Realism has been recommended as worthwhile for all forms of research (Hunt & Hansen, 2008), and specifically as the best philosophical solution to scholarly work in the marketing domain (Hunt, 2011).

3.1.3 Critical realism as the philosophical foundation of this study

The central aim of realism is to understand how the world really is, and it is argued to be a good guiding philosophy for marketing research (Sobh & Perry, 2006; Hunt & Hansen, 2008). It argues that understanding the 'truth' should be the appropriate goal for marketing research (Hunt, 2011).

> " There are numerous 'isms' in the philosophy of science, of all these 'isms' scientific realism seems to make the most sense for marketing, for no other philosophy is coherent (without being dogmatic), is critical (without being nihilistic), is open (without being anarchistic), is tolerant (without being relativistic), is fallible (without being subjectivist), and at the same time, can account for the success of science" (Hunt & Hansen, 2008:30).

In scientific realism, "all of sciences' knowledge-claims are provisional, subject to revision on the basis of further evidence" (Hunt & Hansen, 2008:15). Sobh & Perry (2006:1195) recognise the ontology of realism as "imperfectly and probabilistically apprehensible", and therefore qualitative research techniques are required to understand the truth. Further, realists believe that everything is an approximation of reality and

therefore, every new observation takes the researcher closer to understanding the reality (Olsen, 2010).

Sayer (2000:4) explains eight propositions of realism as, "(1) The world exists independently of our knowledge of it, (2) Knowledge of that world is imperfect and theory-laden, (3) Knowledge develops neither wholly continuously as the steady accumulation of facts within a stable conceptual framework nor wholly discontinuously through simultaneous and universal changes in concepts, (4) There is necessity in the world; objects-whether natural or social, necessarily have particular causal powers or ways of acting and particular susceptibilities, (5) The world is differentiated and stratified consisting of not only events but objects including structures which have powers and liabilities capable of generating events, (6) Social phenomena such as actions, texts and institutions are concept-dependent, (7) Science or the production of any other kind of knowledge is a social practice, and (8) Social science must be critical of its object and therefore, researchers have to evaluate them critically to explain and understand the social phenomena".

The mixed method approach was recognised as a suitable methodology in realism (Clark, 2008; Maxwell & Mittapalli, 2010; Olsen, 2010).

> "Realism can constitute a productive stance for mixed method research and can facilitate a more effective collaboration between qualitative and quantitative researchers" (Maxwell & Mittapalli, 2010:145).

The research design process in realism is described by Sobh & Perry (2006:1206) in two stages in which "the first stage is relatively exploratory that builds the conceptual framework and next to confirm or disconfirm the framework(s)". The importance of recognising theoretical foundations was pointed out as "realist researchers enter the field with prior theories... the prior theory is precious and is gradually built in stage one" (Sobh & Perry, 2006:1202). Olsen (2010) explains realists' view that 'structures exist', and notes that they are therefore likely to use independent or dependent variables in data and search for latent factors that are only implicitly (not directly) measured.

Hunt (1991) views the major problem of realism as that there are so many versions of it. Hunt (2005) proposes four fundamental views of scientific realism as, classical realism, fallibilistic realism, critical realism and inductive realism. Amongst these, 'critical realism' is widely used in social sciences (Yeung, 1997).

Critical realism, initially proposed by Roy Bhaskar (1975, 1979), is located in between positivism and constructivism (Clark, 2008). It is currently recognised as a popular 'post-positivist approach' (Fleetwood & Ackroyd, 2004) and provides 'valid practice knowledge for social work' (practice validity) (Houston, 2001), management (Mingers, 2006) and especially in the marketing context (Easton, 2002).

Easton (2002:108) proposes 'critical realism' as the best alternative to the predominant positivism in marketing. From the critical realist's view, many marketing researchers try to solve the question, "What are the necessary key relationships that are crucial to the understanding of marketing phenomena and why does this take place?" (Easton, 2002:105). Critical realists recognise that their 'observations and knowledge can never be pure and unmediated, but are relative to the time period and culture' (Mingers, 2006). Therefore, the common goals of critical realists are to "describe, predict, correlate, and intervene" in research phenomena with a focus on describing events or understanding causality in the world, which connects 'events to their causes', in a process known as 'abduction' (Clark, 2008:167).

Critical realism is mainly used in two different ways (Hunt & Hansen, 2008).

- First, it critically assesses and tests knowledge claims to answer their truth content
- Second, it assesses and re-evaluates the methodologies and epistemologies that inform extant scientific practice.

According to critical realism, the world consists "not only of events, states of affairs, experiences, impressions, and discourses, but also of underlying structures, powers, and tendencies" (Patomaki & Wight, 2000:223). Critical realism is concerned with "testing the truth content of knowledge-claims" stressing the importance of on-going efforts to develop better measures of constructs (Hunt & Hansen, 2008:15). It views human behaviour as being influenced by both agency and structural factors, such that although humans have a degree of agency, this relationship is always controlled by many factors in the surrounding environment (Clark, 2008).

In critical realism, the underlying reality is provided with the conditions of possibility for actual events and perceived experienced phenomena (Patomaki & Wight, 2000). The ontology of critical realism views reality as 'complex' and allows to be conceptualised the reality and theorised it in order to guide the empirical work (Clark, 2008). The

epistemology of critical realism assumes the existence of main three dimensions of reality, termed 'actual'- (events/ outcomes that actually occur in the world) ' real'- ('underlying relations, structures, and tendencies that have the power to cause changes in the actual realm) and 'empirical' (dimensions which refer to the individual perspectives on the actual and real domains) (Clark, 2008).

The ontology, epistemology and methodology in critical realism (Mingers, 2006) are explained in the following table.

Table 3. 1: Ontology, epistemology and the methodology in critical realism

Ontology (how the world really is)	'There does exist a world independent, to differing degrees, of human beings and that the underlying mechanisms generate the events we observe and experience'.
Epistemology (how we can come to know it)	'We do not have pure, unmediated access to this world but that our knowledge must always be locally and historically relative'.
Methodology	'The 'retroductive approach' of hypothesising generative mechanisms that would explain our experiences and then try to confirm or deny their existence'.

Adapted from Mingers (2006:31)

The logic in critical realism is known as 'retroduction' (McEvoy & Richards, 2006) which indicates a movement from observation and understanding of experience to recognising the fundamental structures and mechanisms which cause the observed phenomena (Mingers, 2003). Retroduction always questions the reasons for (why) events have happened in the manner they did (Olsen & Morgan, 2005).

Critical realism is based on the tenet that 'understanding the reality' is the primary concern and therefore the selection of methodology is secondary, so the researcher can select a good method to understand the complexity of the real research domain (Clark, 2008). Thus, critical realists do not adhere to a single research method but are free to adopt a combination of quantitative and qualitative research methods (Zachariadis et al., 2013). The purpose of mixing methods in critical realism are explained in the following table.

Table 3. 2: Use of mixed methods in critical realism

Purpose of using mixed methods	**Description**	**Implications from Critical realism**
Complementarity	Mixed methods are used in order to gain complementary views about the same phenomena or events.	Different levels of abstraction of a multi-layered world demand different method.
Completeness	Mixed method research design is used to ensure a complete picture (as detailed as possible) of the phenomenon under study.	Requires meta-theoretical considerations (i.e., angle of approach)
Developmental	Inferences of one type of research are used as questions for another type of research.	This being part of the retroductive approach of CR, inferences need to hypothesise about the causal mechanisms whose recovery will then inspire additional research.
Expansion	Mixed methods are implemented to provide explanations or expand the understanding obtained in previous research.	Quantitative methods can be used to guide qualitative research which (subject to the context) is more capable of uncovering generative mechanisms.
Corroboration/ Confirmation	Mixed methods are used in order to use one study to confirm the findings from another study.	Epistemic fallacy occurs when trying to validate qualitative results with quantitative methods.
Compensation	The weakness of one method can be compensated by the use of another method.	The weaknesses of different methods are recognised so alternative methods can be used to compensate.
Diversity	Mixed methods are used to obtain divergent views on the same phenomena.	Different levels of abstraction of a multi-layered world demand different method.

Source: Zachariadis et al. (2013:11)

Referring, to the research problem, questions, objectives, ‘critical realism’ is recognised as the underpinning philosophy of this study. This is because, this study aims to explore the reality of customer value co-creation in self-service technologies. To achieve this main purpose, the study first explores customers’ true intentions of accepting self-service technologies in value co-creation with the reasons (causes/why), second, it aims to discover what customers actually do in co-creating value in self-service technologies (customer value co-creation practices) and finally, to understand customer value c-creation experience in SSTs. Moreover, the researcher wants to obtain statistically valid results to enable generalisation of findings. Therefore, this research is methodologically designed with mixed methods to obtain open data at the beginning, leading to modification of the conceptual framework and continuing with a quantitative survey as the next step. This design is discussed in detail below in section 3.2.2 on the research design.

CHAPTER THREE - SECTION TWO

RESEARCH METHODOLOGY

3.2.1 Introduction

Section-2 of the methodology chapter expounds the overall study design. It begins by describing the purpose of the research design, research approach, types of mixing the data, steps in data collection and the main data analysis procedures. By clarifying the concerns in main research design, the specific research methods for the qualitative and quantitative studies are discussed independently in separate subsections.

3.2.2 Research design

The research design is a 'blueprint or plan for the collection, measurement, and analysis of data, created to answer the research questions' (Sekaran & Bougie, 2016:95). It guides the researcher on practical approaches to the research, including which steps to follow, the information needed, methods of data collection, analysis etc. Good research designs ensure the efficiency and effectiveness of the research project. Therefore, when designing a research, it is necessary to ensure the balance between understanding the design from the perspectives of the decision maker and the respondent, since decision makers always expect accurate, current, relevant, sufficient information, although in practice it is extremely difficult, with many possible sources of errors (Malhotra & Birks, 2007).

A research design involves a series of steps in decision making, such as determining the purpose of the study (whether it is exploratory, descriptive or hypothesis testing) (Sekaran, 2006), the research approach, the type of investigation, the location (study setting), the extent of researcher interference, time horizon, unit of analysis etc. (Sekaran & Bougie, 2016). These decisions are discussed in the following sections.

3.2.3 Purpose of the research design

The purposes of research designs are identified under main three categories as 'exploration', 'descriptive' and 'hypothesis testing' (Sekaran, 2006) or 'exploratory', 'descriptive' and 'causal' (Hair et al., 2003; Cooper & Schindler, 2006). A similar

classification is provided by Malhotra & Birks (2007) as ‘exploratory’ and ‘conclusive’ where ‘descriptive’ and ‘hypothesis testing research’ are considered under the ‘conclusive’ category.

Exploratory studies are undertaken when there is not enough information provided in existing literature, and therefore preliminary work is needed in order to be familiar with the phenomena (Sekaran & Bougie, 2016). Therefore exploratory research is vital when more information is needed to develop comprehensive theoretical frameworks (Sekaran & Bougie, 2016) and to gain additional insights about the study matters (Shukla, 2008). This type of research involves understanding the nature of the problem and is usually appropriate when the researcher does not have sufficient understanding to continue the research project (Malhotra & Birks, 2007). Further, this approach is appropriate in situations where the study phenomena cannot be measured quantitatively (Sekaran & Bougie, 2016). Saunders et al. (2009) show that literature review, expert reviews and qualitative interviews are exploratory types of studies. Exploratory research can be used as a single strategy or preceding descriptive or causal studies. (Malhotra & Birks, 2007).

Descriptive research aims at describing the characteristics of a particular population using scientific analysis procedures (Hair et al., 2003) and is mainly used in testing hypotheses. As noted by Sekaran & Bougie (2016:43) descriptive research aims to “obtain the data that describes the topic of interest”. Descriptive research is prevalent in marketing to specify frequencies, relationships etc. (Shukla, 2008). Malhotra & Birks (2007) categorise descriptive research under conclusive research designs, since it provides conclusions based on hypothesis testing and examining relationships. These types of research are characteristically more formal, structured and based on large, representative samples. Descriptive research is typically based on previous evidence and could be an extension of an exploratory research (Malhotra & Birks, 2007) by providing approaches to verify and quantify the insights obtained through exploratory studies (Shukla, 2008).

Causal studies are used in understanding cause and effect relationships especially in experiments, although this purpose is not applicable in this study. The following table (Table 3.3) briefly differentiates these three purposes of research designing.

Table 3. 3: Differences in types of research designs

	Exploratory Research	Descriptive research	Causal research
Emphasis	Discover ideas and insights	Frequencies, relationships	Determine cause and effect
Features	Flexible, unstructured	Hypothesis based, structured	Variable control
Techniques used	Mostly qualitative research	Mostly quantitative research	Experiments

Source: Shukla (2008:39)

As revealed in the previous chapters, co-creation in the technological interface is a seriously underexplored research area. Therefore, this research initially aims at 'exploring' customer co-creation intention and practices in self-service technologies. As the second step, this research aims at 'describing' the research phenomenon by testing hypotheses in a comprehensive conceptual model which connects customer co-creation intention, practices and experiences in a single platform. Following the suggestions of Malhotra & Birks (2007), in this study, the exploratory part precedes the descriptive part of the research, allowing the findings of the exploratory study to be used in developing the conceptual model, operational definitions and the questionnaire for the second part of the study. The descriptive part of the study aims at obtaining statistically valid findings to explain the interplay between value co-creation and total customer experiences in self-service technologies. The conceptual model, hypothesis and theories are tested in the descriptive part of the study to obtain an advanced understanding of the relationships that exist among variables (Sekaran & Bougie, 2016). Therefore, this research is designed to achieve main two purposes of 'exploring' the study context at the beginning and 'describing' the characteristics of the research phenomena in a later stage, through an empirical survey.

3.2.4 Research approach

In order to achieve the above research purposes, a qualitative, or a quantitative approach or a combination of both approaches can be implemented. The qualitative research method is appropriate for exploration, while statistics based quantitative approaches are better in conclusive research including hypothesis testing (Sekaran & Bougie, 2016). The combination of these two approaches (mixed method) is appropriate when the research

calls for both exploring the study matters and providing conclusions with confidence (Feilzer, 2010).

On this principle, 'Mixed method approach' is becoming popular among scholars (Harrits, 2011) since it combines the strengths of both qualitative and quantitative techniques (Creswell, 2009), although the maximum potential of such an approach has not been fully utilised yet (Onwuegbuzie et al., 2009). A drive towards mixed method research is now visible in different fields of social sciences (Ross & Onwuegbuzie, 2015) even though a little coverage of it is evident in the marketing discipline (Harrison & Reilly, 2011). This approach offers an answer to an unproductive long-lasting debate over the superiority of quantitative Vs qualitative research (Feilzer, 2010) by proving that a strict qualitative-quantitative dichotomy cannot effectively answer many research questions (Tashakkori, 2009).

The mixed method approach is defined as:

> "the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative viewpoints and quantitative viewpoints, data collection, analysis inference techniques) for the broad purposes of breadth and depth of understanding and corroboration" (Johnson et al., 2007:123).

Tashakkori & Creswell (2007:04) define mixed methods research as a "class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study or a program of inquiry". The mixed method approach allows the opportunity for the researcher to select appropriate techniques to answer different kinds of research questions (Johnson & Onwuegbuzie, 2004; Creswell & Clark, 2011; Frels & Onwuegbuzie, 2013).

> "Mixed method research also is an attempt to legitimate the use of multiple approaches to answering research questions, rather than restricting or constraining researchers' choices … It's a logic of inquiry includes the use of induction (or discovery of patterns), deduction (testing of theories and hypotheses), and abduction (uncovering and relying on the best of a set of explanations for understanding one's results)" (Johnson & Onwuegbuzie, 2004:17).

This approach allows collection, analysis and interpretation of both types of data in a single study (Creswell, 2009; Leech & Onwuegbuzie, 2009) and these two methods are not conflicting, but complementary to each other (Morse, 1991). Mixed methods are suitable when testing elements of an emerging concept (Morgan, 1998), to explore at the beginning and generalise the concept at a later stage (Creswell, 2013).

Harrison & Reilly (2011:20) state that a common failure of mixed method researchers is that not making the best use of the mixing by often under-reporting and accomplishing weak analysis. In bridging this methodological gap, this study aims at gaining the maximum use of mixing the methods by using the qualitative findings as the base for the quantitative study.

As stated in the section 3.2.3 on the purpose of the research designing topic, this research aims at the initial exploration of the phenomena of interest followed by providing conclusions supported by statistics-based hypothesis testing. Therefore, the mixed method approach is selected in designing the research, where qualitative study precedes the quantitative research.

3.2.5 Types of mixed qualitative and quantitative studies

Creswell & Clark (2011); Creswell (2013) propose two main types of mixed methods designs; 1. Simultaneous (Concurrent) mixed method which uses both qualitative and quantitative methods at the same time without any sequence, and takes three forms: triangulation strategy, concurrent embedded strategy and concurrent transformative strategy. 2. Sequential mixed method, where one method builds on the other. There are three types namely, sequential explanatory strategy, sequential exploratory strategy and sequential transformative strategy. This study is based on the 'sequential form of mixed method', since one type of data collection and analysis (qualitative) is followed by the other (quantitative).

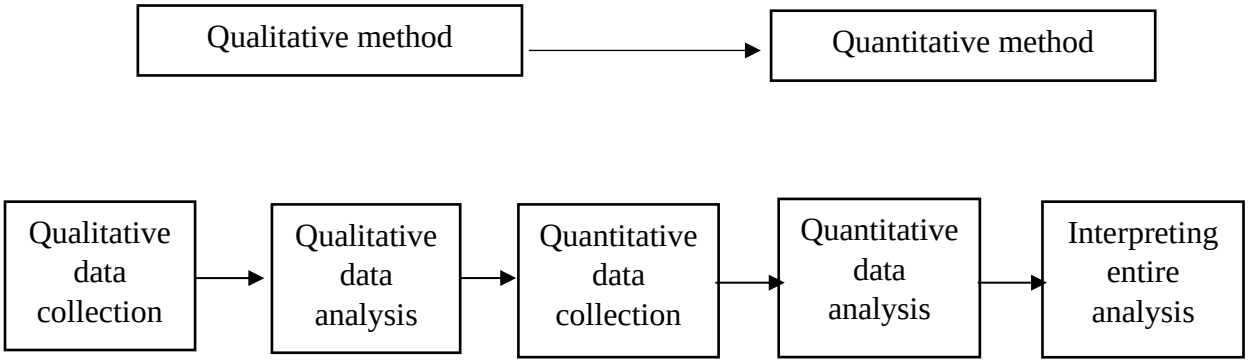
The 'Sequential explanatory strategy' starts with the collection and analysis of quantitative data, followed by qualitative data collection and analysis. This mixed method approach is typically used to explain and interpret quantitative results by a follow up using qualitative data. This approach is useful when researchers obtain unexpected quantitative findings, to explain their surprising results in detail (Creswell, 2013).

The ‘Sequential exploratory strategy’ uses the qualitative data collection and analysis at the first stage, followed by the quantitative data collection and analysis. In this approach, quantitative data collection tools build upon the findings of the qualitative study. In this method, quantitative findings are used to support qualitative findings and it is better suited for interpreting relationships. This method is appropriate for testing elements that emerge in the qualitative study or to develop the research instrument for the quantitative study when instruments are not available or existing instruments are inadequate (Creswell, 2013). Therefore, the study takes three stages, in which the first is to conduct qualitative data collection and analysis, the second is to develop the instrument and the third is to administer to a selected sample. This design may or may not be supported by theoretical perspectives. This method uses qualitative data based on small samples to be empirically tested in large samples in the second stage of the study, in order to generalise the qualitative findings (Creswell & Clark, 2011). However, it takes a substantial time to complete both stages of data collection and analysis.

The ‘Sequential transformative strategy’ is also composed of two data collection stages, but it also has a theoretical lens or conceptual framework to guide the study. Either qualitative or quantitative method can be in the first stage. This method aims to comprehend better and assist the theoretical perspectives.

This research is based on the ‘sequential exploratory design’ where the qualitative research method begins the data collection and analysis aiming at exploring the phenomenon, then the qualitative results are interpreted and used to develop the quantitative data collection instrument. Finally, the findings are generalised through empirical test with a large sample. The process of mixing methods is graphically illustrated in figure3.1.

Figure 3. 2: Sequential exploratory design



Source: Creswell (2009:209)

3.2.6 Steps in data collection

As suggested in sequential exploratory research (Creswell, 2009; Creswell & Clark, 2011), there are two main stages of data collection in this study, where the qualitative data collection stage precedes the quantitative stage. While performing these two main stages, a few other additional steps were taken to ensure the clarity, accuracy and generalizability of the outcome. The following table shows the steps gone through in collecting information and data. Separate detailed discussions on data collection are provided in Section-3 and Section-5 on the qualitative and quantitative research designs, respectively.

Table 3. 4: Data and information collection stages in the study

Step one	**Literature review** • The literature on value co-creation, self-service technologies and customer experience was reviewed to identify gaps and develop research questions and objectives. • Theories and related measurements used in previous studies were identified. • This understanding was used to develop the interview protocol for the semi-structured interviews.
Step two	**Qualitative semi-structured interviews** • Semi-structured interviews were conducted. • They were analysed, and themes and patterns were identified. • The questionnaire for the quantitative study was developed based on the qualitative research findings.
Step three	**Expert reviews** • The preliminary questionnaire with construct definitions was sent to 12 experts to obtain their opinion for further improvements. • Some questions were eliminated, combined and modified based on experts' opinions and areas of misunderstandings or less clarity were identified and corrected. • Face and content validity were ensured through this process.

Step four	**Pilot Study** • The questionnaire was piloted with 45 respondents. • The questionnaire was refined addressing the drawbacks recognised through the pilot study • A preliminary data analyses was conducted to recognise the fundamental issues in the questionnaire.
Step five	**Field survey** • A field survey was conducted with 493 respondents. • Data of the field survey were used to test hypotheses.

Adapted from Creswell & Clark (2011:88)

In collecting data and information, a comprehensive literature review was conducted as the first step, and the outcomes were discussed in Chapter Two. The knowledge gathered from the literature review was used in identifying research gaps and developing the foundation for both qualitative and quantitative studies. Semi-structured interviews were conducted for collecting qualitative data, mainly to understand customer value co-creation in self-service technologies. These findings were used in developing the quantitative data collection tool. Expert reviews for the initially developed questionnaire were obtained, and the comments given by experts were addressed before moving to the next stage, which is the pilot study. The field survey was the final data collection stage, which used a questionnaire, carefully filtered and improved through the previous stages of the study.

3.2.7 Data analysis

As in many mixed methods studies, the data are analysed independently in each quantitative and qualitative stage (Teddlie & Tashakkori, 2009). Thematic analysis is used in analysing qualitative data, aiming to recognise themes and patterns. Quantitative data analysis is the second step and focuses on testing hypotheses and providing statistically valid findings using Structural Equation Modelling (SEM). The findings of both qualitative and quantitative studies are combined and compared to provide rich discussions.

Tashakkori & Creswell (2007) outline the mixed method approach consists of two distinct types of research questions, approaches in developing research questions, sampling

procedures, data collection procedures, data, data analysis procedures and further two types of conclusions, for its qualitative and quantitative parts. Therefore, this study discusses the design of the qualitative and quantitative parts of the study separately.

Further, as Creswell & Clark (2011); (Creswell, 2013) suggest for Sequential Exploratory research designs, quantitative research design in this study is based on the collection and analysis of the qualitative research data. Therefore, the findings of the qualitative study are reported prior to the quantitative study design. The data analysis procedures are comprehensively discussed in these separate sections:

Section-3: Qualitative study design (Study Part One)

Section-4: Findings of the qualitative study

Section-5: Quantitative study design (Study part two)

3.2.8 Ethical considerations in the study

Ethical clearance for the study was obtained from the ethics committee of the University of Hull, and the approval letter is provided in annexure i. Since this study aims to broaden knowledge and suggest practical implications to improve the customer experiences, which indirectly increases the quality of life of customers through the proper use of SSTs, the study is unlikely to have a harmful impact on individuals or society at large. Apart from this broad view of being ethical, the following describes the other fundamental ethical issues related to each stage of the study.

- At the stage of reviewing literature: The researcher has been careful not to misrepresent data and has striven to secure honesty in communications, reporting data, drawing and interpreting results etc. Further, respect has been paid to intellectual property by acknowledging copyrights and avoiding deliberate plagiarism.

- At the stage of data collection: As Bryman & Bell (2007) suggest, the following conduct was maintained in the study, to maintain decent ethical behaviour. Respondents were selected purely based on their voluntary participation in the interview, and all of them made fully conversant about the whole processes that they would have to go through in the research. The time and place for the interview were decided based on the convenience of the respondent, and the

researcher visited the respondent in the pre-appointed place, ensuring punctuality. A polite reminder was given before the visit to ensure the availability of the respondent.

Before starting the interviews, the respondents were informed about their role as respondents in the study and their right to withdraw from being a respondent of any time during the interview process. Apart from verbal explanations, a pre-designed information sheet (annexure ii) was given for this purpose. Further, the information sheet included information about the research, use of findings and contact details of both the researcher and the principal supervisor. There was no discrimination in selecting the participants, other than considering whether the respondent is matched the inclusion criteria of the sample. The interview protocol, information and consent sheet were prepared in the English language, since it is the main language in the study context (United Kingdom).

The consent sheet (annexure iii) was used to obtain assurance of the respondents' willingness to participate in the survey. Respondents' rights to anonymity and confidentiality were highly protected throughout all the stages of the research process. Further, discrimination by sex, race, ethnicity, etc. was avoided in this study, and all the participants in the sample were given equal opportunity. The privacy and confidentiality of the respondents were ensured through every step in the research process. The respondents are anonymous in the research, and a serial number was given to each making it easy to cross-check with the relevant gender and approximate age group. Every discussion about the study was made transparently. Both the information sheet and the consent form were attached to the questionnaire for the field survey, requesting the respondents to sign and send the consent form back to the researcher with the filled questionnaire.

- At the stage of research designing and reporting results: Attention has been paid to fairness by avoiding bias in research design, data analysis and interpretation, personal decisions and self-deception. Further, every effort was made to avoid careless errors and negligence in the research work. Further, the researcher is willing to open the data, results, ideas, tools and resources for any criticisms or new ideas about the study.

CHAPTER THREE - SECTION THREE

QUALITATIVE STUDY DESIGN

3.3.1 Introduction

This section explains the design of the qualitative study. The purpose of the qualitative study, data collection procedure, the process of selecting participants for the study, data analysis procedure and the process for ensuring the trustworthiness of the findings are discussed in this section.

3.3.2 Purpose of the study

As described in the literature, value co-creation in self-service technologies is an underexplored research area and none of the previous research particularly identifies the 'co-creation practices' in self-service technologies. Even though many previous studies have used general technological acceptance models in an attempt to understand customer acceptance in SSTs, they have not been able to fully explain the self-service technology context (Blut et al., 2016). Therefore, there is still a need for comprehensive models to explain customer intention of accepting self-service technologies. Since value co-creation in technological interfaces is underexplored and there is a lack of information available in similar contexts, this research aims to expand the understanding of the relevant concepts by exploring facts. Therefore, the main purpose of this qualitative study is to explore customers' intention of accepting self-service technologies in value co-creation with its antecedents and discover customer value co-creation practices at self-service technologies.

3.3.3 Qualitative data collection procedure

A qualitative approach is natural and studies real behaviours of people in natural settings (Marshall, 1996). Interviews are generally used in conducting qualitative research, in which the "researcher is interested in collecting facts, or gaining insights into our understanding of opinions, attitudes, experiences, processes, behaviours, or predictions" and such interviews can be conducted either with one person (individual interviews) or with a group of people (focus groups) (Rowley, 2012:261).

Interviews are often classified based on their level of 'structure' (Rowley, 2012). 'Structured interviews' consist of a list of questions which are similarly asked from each respondent, and the researcher is strict in following the interview guide. 'Unstructured interviews' emphasise encouraging the respondent to talk about a theme, and apart from that, the interviewer may adapt the questions based on the interview responses. Between these extremes is the most common type of interview, the 'semi-structured interview', which takes a variety of different forms (Rowley, 2012). The schedule of a semi-structured interview consists of a combination of well-phrased questions and some flexible questions with probes, typically explaining in the following quotes.

> "approximately six to twelve well-chosen and well-phrased questions to be delivered mostly in a set order, but with some flexibility in the questions asked, the extent of probing, and question order, is a good starting point"…Each question may have two to four sub-questions or prompts, which are used by the interviewer if they are necessary to ensure that the interviewee explores the main question sufficiently" (Rowley, 2012:262).

This study used semi-structured interviews in collecting data for the qualitative part of the research. An interview guide was produced as the research instrument to make the interviewing process easy, smooth and focused. Respondents were probed on their intention of using SSTs in value co-creation with the reasons/factors and on what they do in co-creating value in SSTs (activities/practices). Information collected at this stage was used to develop the conceptual framework and questionnaire for the quantitative study as will be discussed in section-5.

3.3.4 Data collection instrument

This study used an interview protocol as the data collection instrument for the qualitative study. As Creswell (2013) suggests, an interview protocol mainly includes opening comments, instructions for the respondent, interview questions, follow-up questions, and a closing statement. The interview protocol in this study begins by introducing the research, the researcher and the aim of the interviewing the respondent. Clear instructions were given to the respondents about the interview process. The main questions in the protocol were on respondents' use of SSTs, factors which influence their intention of accepting SSTs and their co-creation practices (what they do in co-creating value at SSTs). The interview protocol is provided in annexure iv.

3.3.5 Preparation for the interviews

As Turner (2010) suggests, preparation for the interviews is central to conducting successful field interviews. It can be done by conducting a few pilot interviews with selected respondents who have similar interests to the actual participants of the study.

In this study, one pilot interview was conducted with a British resident PhD student. The main purpose of this pilot interview was to make sure whether the respondent could understand the questions easily, identify any repetitions in questions,or any problems with the flow of the interview, discover how probing work in practice, find out how long a typical interview takes and check whether the interview covers all the kinds of information required.

Further, piloting helped to improve the interview protocol by changing the order of few questions to improve the flow of the questioning process and a few follow-up questions were added to the protocol.

3.3.6 Data collection period and environment

The data were collected through face to face interviews with the respondents in June and July -2016. The interviews were conducted in the natural (non-contrived) environment (Sekaran & Bougie, 2016), based purely on the convenience of the respondents, where they felt comfortable for interviews. Prior appointments were obtained from the respondents for interviews.

The interviews were preceded by sharing pleasantries and giving a brief explanation of the research including the importance and use of respondents' information. Before starting the interview, the respondent's consent to participate voluntarily in the research was obtained by producing a formal consent sheet. An informal request was made to record the interviews to facilitate the transcribing process. Information sheets also were provided with a research brief and the contact details of the researcher. Further, a list of SSTs including telephone/interactive voice responses, online/internet, interactive kiosks a CD/DVD based categories was provided to respondents at the beginning of the interview, to make them familiar with the types of SSTs available.

Respondents were encouraged to talk about the influential factors for their intention of accepting self-service technologies and the activities they frequently carried out in

different SST settings including problems/difficulties that they encountered while performing such activities. The research setting resembled a conversation, with the duration ranging from 30 to 45 minutes per subject.

3.3.7 Selecting the participants

The first stage in selecting participants is to define the sample universe or target population. The sample universe is defined as the "the total population of possible cases for the sample" (Robinson, 2014:27). The target population for this study comprises people above eighteen years old in the United Kingdom who have experienced self-service technologies.

In selecting from among this population, exclusion criteria were applied. 'Exclusion criteria' for a sample specify "who/ what can/cannot be included in the study" (Robinson, 2014:27). In this study, potential respondents below eighteen years old were excluded as they are not considered as adult customers. No upper age limit was applied. Further, people who had not experienced at least one of the self-service technology options and currently not reside in the United Kingdom were not taken to the sample.

3.3.8 Participant recruitment procedure

Participant recruitment in qualitative studies is naturally evolving and subject to change based on ongoing reflections (Lincoln & Guba, 1985), and therefore probability sampling is inappropriate (Coyne, 1997) (Morse, 1991; Miles & Huberman, 1994; Marshall, 1996).

Among the three broad sampling strategies used in qualitative research work (convenience sampling, purposive sampling and theoretical sampling) (Marshall, 1996), convenience sampling is the least rigorous method which studies the most convenient and accessible subjects (Robinson, 2014). This method is the least consuming of time, cost and effort, however, can generate poor quality results with a lack of credibility (Marshall, 1996). Theoretical sampling was originally connected with the 'grounded theory' as a method of analysing qualitative data in theory building (Coyne, 1997; Mason, 2002), and developed on an iterative basis (Charmaz, 2006). It is a process of data collection where the researcher simultaneously engages with the collection, coding and analysis in order to determine which kind of data to be collected next (Coyne, 1997).

Judgemental sampling (purposive sampling) is a common sampling strategy in qualitative research work (Devers & Frankel, 2000), which is used for selecting participants in this study. Here, the researcher keenly seeks out respondents who can provide necessary insights for the study (Patton, 1990). This approach is widely used in qualitative research to identify information-rich cases in the phenomenon of interest (Patton, 2002; Palinkas et al., 2015). The researcher's judgment on which respondents will provide the best perspective is the key determinant in selecting the sample (Abrams, 2010).

Qualitative research work is heavily dependent upon purposive sampling, since the researcher wants to talk with people who have information about the study matters (Marshall, 1996). The findings of judgemental sampling combined with researchers' practical knowledge of the study context and available literature are commonly used as well as valid for developing conceptual frameworks (Marshall, 1996). This method allows distinguishing the required sample not only based on the socio-demographic balance but also in accordance with their known beliefs and attitudes (Marshall, 1996). Judgemental sampling is equally important to study subjects who have specific experiences (critical case sample) and subjects with special expertise (key informants) (Marshall, 1996). Typical case sampling (the average person in the study context), extreme case sampling (selecting atypical cases who are exceptionally good or bad/ outstanding successes or noticeable failures etc.) and network sampling (snowballing) are also types of purposive sampling (Creswell & Clark, 2011). However, it is also important to interview a sufficient number of respondents, so that people with different roles, experience, backgrounds, and any other source of variability might be included in the study (Rowley, 2012).

Considering its suitability in qualitative studies (Marshall, 1996; Coyne, 1997; Devers & Frankel, 2000), and particularly in the value co-creation context (Marcos-Cuevas et al., 2016), a non-probabilistic purposive sampling method was used in recruiting participants. This is because the researcher's judgment on which respondents can provide the best perspective on the research questions (Abrams, 2010) helps to identify information-rich cases (Palinkas et al., 2015). A range of socio-demographic groups, including different ages, sex and employee categories, were included in the sample.

3.3.9 Sample size

A suitable sample size for a qualitative study is accomplished when adequate answers to the research question have been obtained (Marshall, 1996). Therefore, the sample size is rarely predetermined (Robinson, 2014), as qualitative researchers are often unaware about the level of theoretical saturation (Silverman, 2010) or when further data collection will stop (Lincoln & Guba, 1985). It rather depends on the level of the researcher's achievement of required information (Palinkas et al., 2015) or in practice, when new categories, themes or explanations are no longer emerging (Marshall, 1996). When the researcher judges that theoretical saturation is achieved, data collection can be stopped, because beyond this point, it will not provide any new themes or additional information. Therefore, the concept of saturation is recommended in determining the appropriate sample size for a qualitative study. Patton (1990) points out that the study objectives, available time and resources as key determinants in deciding the sample size in qualitative studies. Qualitative enquiries based on interpretative phenomenological analysis tend to involve carefully selected small samples (Moustakas, 1994) and researchers are typically advised to have 3–16 participants for a single study, with the lower end for undergraduate projects and the upper end for larger-scale funded projects (Tindall, 2009). Creswell (2007) suggest 5-25 participants for phenomenological studies.

This study is confined to fifteen respondents, since the information saturation was reached at that point. The following table provides the frequencies of demographic factors of the sample of the qualitative study.

Table 3. 5: Sample profile of the qualitative study

Respondent's characteristics		Frequency (n)
Gender	Male	8
	Female	7
Age	18-24 Years	2
	25-34 Years	3
	35-44 Years	3
	45-54 Years	3
	55-64 Years	2
	65 or older	2
Education Background	GCSE level	2
	GCE AL or equivalent	5
	University Degree or equivalent	5
	Postgraduate Degree	3
Employment	Full time employed	6
	Part-time employed	3
	Unemployed	2
	Retired	2
	Student	2

3.3.10 Controlling sources of errors in the qualitative study

Malhotra & Birks (2007) categorise total errors in a research into two groups, sampling errors and non-sampling errors. Participant selection for the qualitative study was based on a non-probability purposive sampling method, and therefore, as in many qualitative studies, there is an inherent problem of non-representativeness. However, the respondents were selected based on the researcher's judgement, considering the information availability and the representativeness of different demographic groups. In this way, the study could obtain a variety of important factors which were needed to build upon the conceptual framework and the questionnaire.

Non-sampling errors are identified under two major categories as 'response errors' and 'non-response errors'. Non-response errors were reduced to a minimum level in this study, by selecting respondents based on purposive sampling and keeping prior appointments to make sure of the availability and readiness of the respondent for the interview.

To reduce 'response errors', approaches were taken to minimise respondents' inability and unwillingness to participate by informing them about the nature of the interview and

choosing times and locations based on their convenience. To build up a good rapport, a friendly discussion was carried out before the interview. Further, information about the researcher, contact details, the nature of the study, and the use of responses was explained verbally and through the information sheet. The interviews were carried out like a conversation and sensitive questions were not included in the conversation. Interviewer error including questioning, cheating and recording is minimal in this study, since the researcher herself conducted all the interviews without hiring external interviewers. Further, the credibility and confidentiality of the responses were ensured as discussed later in the section 3.3.12.

3.3.11 Data analysis procedure

The data in this phase of the study were analysed by means of 'thematic analysis' which is a method "for identifying, analysing, and reporting patterns (themes) within data" (Braun & Clarke, 2006:6). A theme is a "specific pattern of meaning found in the data" (Joffe, 2011:209) or "patterned response or meaning within the dataset" (Braun & Clarke, 2006:82). This analysis is often known as 'framework analysis', and offers methodical and visible stages to the analysis process so that it is easy to see how results have been found from the data (Lacey & Luff, 2009). Thematic analysis is a "method for systematically identifying, organizing, and offering insights into patterns of meaning (themes) across a data set" and allows the researcher to make sense of commonalities and shared meanings (Braun & Clarke, 2013:57) where emerging themes become the categories for analysis (Fereday & Muir-Cochrane, 2006).

Thematic analysis is useful for analysing interview data usually collected through semi-structured interviews and is also aligned with 'critical realism' and shares many characteristics of traditional content analysis (Joffe, 2011). The results of thematic analysis highlight the most noticeable patterns of meaning existing in the dataset, including all kinds of affective, cognitive and symbolic dimensions (Joffe, 2011). From the transcribed conversations, patterns are generated either as direct quotations or rephrasing common ideas and then identifying data which relate to already classified patterns (Aronson, 1995). Rather than merely identifying themes out of qualitative research work, it should attempt to link them to make models based on findings (Bazeley, 2009). As the final step, it is needed to build a valid argument for choosing the themes mainly through reading the related literature (Aronson, 1995).

Six stages of the thematic analysis process have been suggested as, transcribing data, organising data, familiarising with data, coding, generating themes and ensuring rigour (Lacey & Luff, 2009). Subsequently, a six-stage process was proposed by Braun & Clarke (2013) as; familiarising with the data, generating initial codes, searching for themes, reviewing potential themes, defining and naming themes.

As proposed by Lacey & Luff (2009), this study went through six stages in qualitative data analysis as explained in following steps.

- Transcribing data: Initially, interviews were tape recorded and then transcribed into a word document. Nonverbal cues were also noted down, considering their importance to draw the overall meaning of the responses.

- Organising the data: The transcribed data were organised into easily retrievable sections. Here, the transcription was broken down into different sections so that responses of all respondents to a particular question come under one category.
- Familiarising with data: Listening to audio tapes several times, reading and re-reading the data, making memos and summarising before the formal analysis were done to be familiar with the data. In this study, familiarity was at a high level since the researcher conducted all the interviews, interacting with respondents.

- Coding: Coding is the beginning of many kinds of qualitative data analysis (Liamputtong, 2009). This process involves spotting main instances and encoding them before interpretation (Boyatzis, 1998). A code is "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis, 1998:63). A 'good code' is one that captures the qualitative richness of the phenomenon (Boyatzis, 1998:1). As suggested by Braun & Clarke (2006), in this study coding was done manually by writing notes on the texts, highlighting and making summaries.

- Identifying themes: As the final stage of the data analysis process, emergent themes were identified using coding and re-coding. As noted by Braun & Clarke (2006) in this research, themes identification was practically made by

categorising different codes into potential themes, then organising relevant coded data extracts within the recognised themes, using visual representations such as tables and mind-maps.

- Ensuring rigor**:** Demonstrating that qualitative data analysis is rigorous and ensuring the credibility and trustworthiness are important in qualitative research. As suggested by Braun & Clarke (2006), after identifying themes, the results went through a reviewing process to ensure internal homogeneity and external heterogeneity. Further, the following steps (section 3.3.12) were taken to ensure the credibility and trustworthiness of the qualitative study.

3.3.12 Credibility and trustworthiness of the qualitative study

Ensuring the credibility is important in qualitative research, demonstrating that the methods used are reproducible and consistent. As suggested by Lacey & Luff (2009), this study followed a few simple steps to ensure the trustworthiness of the data.

- describing the approaches and procedures for data analysis
- justifying the appropriateness of these approaches to the study
- clearly documenting the process of generating themes, concepts from the data
- referring to external evidence, including previous qualitative and quantitative studies

Validity in qualitative interviews is explained the 'extent to which an account seems to fairly and accurately represent the data collected' (Lacey & Luff, 2009:27). As suggested by Lacey & Luff (2009), this research went through following steps to ensure the credibility of the findings.

- ensuring the suitability and the fair impact of the research design and analysis methods on the results.
- considering all relevant views, including 'negative' and 'deviant cases' in the analysis.
- ensuring the adequate and systematic use of the original data (using quotations, from different respondents) in the presentation of analysis.

Further, the model developed using the qualitative research findings was subjected to comprehensive validity and reliability tests in the quantitative data analysis stage.

CHAPTER THREE - SECTION FOUR

QUALITATIVE STUDY FINDINGS

3.4.1 Introduction

As Creswell (2013) suggests for sequential exploratory studies, this section provides the findings of the qualitative study, which were used in the next stage in designing the quantitative study.

Since the qualitative study mainly aimed at exploring customer value co-creation intention in self-service technologies with antecedents and their value co-creation practices, the outcomes related to these two purposes are reported separately.

3.4.2 Customer value co-creation intention in self-service technologies

This part of the qualitative research focuses on understanding factors that influence customer value co-creation intention in self-service technologies. Many of the previous research work such as Pikkarainen et al. (2004); Weijters et al. (2007); Lee (2016); Oh et al. (2016) used Technology Acceptance Model (TAM) or the Universal Theory of Technology Acceptance and Use (UTAUT) to understand trial/adoption/acceptance of self-service technologies, although they do not properly explain the self-service technology context (Blut et al., 2016). Apart from that, some scholars have made efforts to explore SST adoption using diverse measures (Meuter et al., 2005; Wang et al., 2012; Hilton et al., 2013; Demoulin & Djelassi, 2016). Pointing out the lack of a comprehensive model in understanding SST acceptance in value co-creation, this study decided to explore the factors conducting a qualitative study. However, recently Blut et al. (2016) has developed a model to explain SST acceptance by conducting a meta-analysis using TAM, UTAUT and Innovation Diffusion Theory (IDT) as the main sources. Although that model is comprehensive compared to the general technology acceptance models in explaining the self-service technology context, there are some important factors which seriously missed in that model, which have been uncovered by this qualitative research.

The interviews found 45 key elements which highly influence customer acceptance of self-service technologies in their value co-creation process. After many readings, re-

readings, unbiased reviews, these elements were categorised into eight groups of factors as: 1. Performance, 2. Convenience 3. Information richness, 4. Technology know-how, 5. Emotional reactions 6. Personal judgements 7. Social influence, 8. Situational factors. Further age is recognised as a key control variable that influences many of these effects. These factors are described with interview quotations in the following section.

3.4.2.1 Performance

The study outlines performance as "the degree to which using SSTs provide benefits to customers in performing certain activities". The interviews identified eight elements that determine the SST performances: usefulness, speed, consistency, cost effectiveness, user friendliness, trialability, efficiency and reliability. The literature show 'performance expectancy' to be the strongest predictor of customer acceptance and use of technologies (UTAUT model) (Venkatesh et al., 2003), and important in determining attitude towards SST usage (Dabholkar & Bagozzi, 2002). Apart from that, many previous scholars have proved the importance of each individual element of the performance factor uncovered in this study, as significant in technology adoptions including SSTs. As the literature suggests, this study also witnessed significant difference among age groups such that younger people have more confidence in SST performance compared to older people (Venkatesh et al., 2003).

A few quotations from interviews are provided in support of the findings. Respondents admired the consistency of SSTs in similar contexts as important in their intention to use SSTs, mainly because they could use their existing knowledge and skills in performing transactions, even in slightly different contexts such as automated checkouts at different shops.

> *You do not need lots of help. Everything is obvious and straightforward. It provides the same service every day. If you have done it once, for the next time also you may have to do the same…all machines are similar, the process may not be changing (consistent). It's easy for me. (45 years, Female)*

Many of the respondents praised SSTs for their speed/quickness of service performance. Therefore, they recognised SSTs as an efficient medium that help them to save time with minimum time waste.

> *Just that it is quick and easy. Basically, it speeds up your life. (38 years, Male)*

Another kind of things like fuel pumping, internet banking, I think it's good because it's efficient, it saves your time and effort. Also, you don't have to wait for someone, if go to the petrol station and it's closed, you can still somehow pay with your card. Moreover, at a supermarket, you don't have to wait for someone, so I think that's good in that sense". (50 years, Male)

It's useful; See, it is really efficient. I am using internet banking, self-checking checkouts, ATM, self-scanning at supermarkets, online shopping and so on… Yes, I mean definitely useful and makes things a lot quicker than others. But one or two seem to be a hindrance, like self-scanning at retail shops. I had issues while scanning something. All of a sudden it says, 'unexpected items and so assistance required', and then someone comes over to help. That happens nearly every time when I use one of those. (38 years, Male)

The study further reveals the user-friendliness of the SSTs, the reliability of service due to not having human errors and the opportunities given for trials as important in customer acceptance.

I am not saying that it's too difficult…many of the self-service options are user-friendly. Nothing we have to do than simply ticking a few numbers and words. All questions are in simple language and in an understandable way... I have seen some provide a few options for language selection too. (45years, female)

These machines are truly reliable. Because, I hope that it is free from human errors. Think of the money you get from ATMs. Have you ever heard of errors with counting? (38 years, male)

I am never quite 100% certain that I've done everything right until the rail ticket arrives or whatever has got confirmation. It's certain when I actually get the ticket physically in my hand or can see the proof. (62 years, female)

Some of the respondents pointed out the cost efficiencies related with SSTs as an influencing factor to collaborate with SSTs.

What I feel is, if I go shopping for everything, it's a big cost for me…see fuel, parking and my time either. I can save my money doing my shopping online. It's clever. (25 years, female)

3.4.2.2 Convenience

Convenience is recognised as the degree of ease associated with the use of SSTs. The study identifies three main convenience factors: locational convenience, less physical exertion and time convenience. In the literature also, locational convenience (Meuter & Bitner, 1998; Beatson et al., 2006), time convenience due to flexible operating hours and convenience of reaching SSTs (Lin & Hsieh, 2011), time and place convenience (Marr & Prendergast, 1993), are recognized as critical in encouraging customers to use self-service technologies. Further, the study found that younger participants were more convenience oriented than older people and more inclined towards using SSTs.

Respondents pointed out that, time convenience provided by SSTs due to 24 hours' operation, every day of the year, including after office hours and holidays etc, is a great advantage. Locational convenience relates to opportunities to perform many services at one's fingertips (in many online services) or in most convenient places such as money withdrawal machines, vending machines etc, placed in locations convenient for customers like supermarkets, the roadsides etc. Less physical effort due to reducing travelling, searching for items and carrying out transactions also were pointed out by the respondents as favourable features of SSTs.

> *It makes my life easier. I do many things online, staying at home, in my bedroom (location). I think it increases the efficiency of purchasing things or sending the bank transactions. It assists your daily life, so you can do some things like you could be at the office but also be shopping for food, you could be possibly at work but then during your breaks send a money transaction to someone. I would say it creates more convenience. (32 years, female)*

> *We are a busy family. I work full time with two children. I don't have time just to go and spend a day in the town shopping leisurely. I personally prefer self-service than actually physically go in and out. It's not to do with laziness. It's just to do with convenience. (45 years, female)*

> *You know, many self-service machines are 24 hours, day and night, weekends, really easy…what happen if I have to get a day off and go for these all matters? I find it difficult in the office hours. (48 years, male)*

With these online, telephone technologies, we don't want to go everywhere to get everything done. It makes me free from unnecessary travelling and tiredness (physical efforts). I think it's good. Just purely because like, for instance, if you want to go to the supermarket you want to get in and out of it very quickly but there is a massive queue at the till, you can just use self-service in using yourself. (38 years, male)

I have two business accounts in two banks. I used to walk to my bank. They closed the branch down in this road. So now I am not going to that bank. She (the manager) asked me to do online. I said no I am not. Now I am using my other bank account. It's convenient to me. (67 years, female)

3.4.2.3 Information richness

The degree of richness and quality of the given information/instructions in SSTs is acknowledged here. The study recognises that information richness in SSTs is a key determinant in customer choice of SSTs, and sufficiency, relevance, timeliness, accuracy, clarity, consistency and simplicity of information/instructions were among them. This is consistent with evidence from literature; Froehle & Roth (2004) show the importance of information richness in determining customer beliefs on technology mediated services. Most of the respondents in this study disclosed that they were happy with the information and instructions received. However, some older respondents pointed out the inability to understand information and instructions in SSTs, pointing out some situations where transactions had gone wrong due to confusing instructions. Incorrect or outdated information in websites, not providing clear guidelines up to the endpoint and complex instructions were among the criticisms.

When you look at it, you can very obviously see how to access different things, whether it's a screen or whether a little display or whether it's a keyboard. Many of the instructions are simple, and kind of minimal steps, not too complicated as you could easily become confused with too many buttons. Obviously, self-service have fewer buttons. If you go to book a hotel it's very clear kind of onscreen information on where you pay, where you review something, where you look for something, where you reserve… It's going to be on something obvious. (22 years female)

I experienced some instructions that are not clear. It makes you confused, and some are inviting mistakes. (62 years, female)

I guess it provides sufficient information to get correct decisions. This is because sometimes there might be no one to ask…but I know self-service technologies do not give nonsense. All important to take us on the right path. (40 years, female)

It's good to make sure whether the information in the websites is correct. *Because I know that sometimes these things are shown online ...but not physically available in the stores…they haven't updated their websites in a couple of weeks. Old, wrong information in the websites. (48 years, male)*

It should be reliable, correct dates, time, price, everything should be exact. You've got to get the right dates when you buy things. Or if it's a company far away you have to make sure you're getting what you want. It should be very definite, otherwise you confuse where you are parking, going, doing, buying etc. (38 years, male)

You know so you're not faffing around trying to figure out how to use it, before actually using it…it should be relevant. You should get there, it should all be working. You shouldn't go halfway through your use of it…. realising it is not working properly. Coz you're just wasting your time… you do not need to. It should be easy. If anything goes wrong someone should be there to help. I think that's all I need. (32 years, female)

3.4.2.4 Technology know-how

General technical knowledge on computers, the internet and SST devices and the ease associated with learning and using SSTs, are recognised within this component. The participants disclosed that reasonable understanding of technological interfaces/devices, knowledge of the internet and computers are needed to perform with many types of SSTs, especially online/internet-based SSTs, CD/DVD based SSTs and some interactive kiosks. It was witnessed that the younger generation are competent in the use of technologies and consider SSTs as an acceptable social trend. As opposed to that, the older respondents revealed that using SSTs was embarrassing for them since they were not upright with computers and technology, and further they showed fear and suspicion towards using self-service technologies. Literature points out some similar evidences, showing the

significance of knowledge and skills for customer choice of SSTs (Hilton et al., 2013), abilities in SST trials (Meuter et al., 2005), the user's state of mind and their 'ability and willingness' to perform the required actions Meuter et al. (2003); (Liljander et al., 2006) on consumer evaluations of SSTs etc. Further, ease of use (Dabholkar, 1996; Meuter et al., 2000; Weijters et al., 2007), including ease of learning (Curran & Meuter, 2005) have been recognized as important in SST adoption.

The following quotations provide evidence for the importance of technology-know-how in customer value co-creation intention in SSTs.

> *You know that today everything is technology, everywhere is connected to the internet. Possibly I think people just really enjoy internet technology. Like smartphones, I pads…it is enriching our daily lives. Like switching on your phone and doing that, it's quite clever. (22 years, female)*

> *Obviously, the easy to use. If someone is saying it's hard, I ask them to do it once and realize what the difficult thing is in there. Just what you need is practice (38 years, male).*

> *You have to use the same kind of machine in every setting. Many of them are similar. It is easy to learn how to use the machine… especially if you handle it once before, nothing again to do. (22 years, female)*

> *It's just working with machines. One thing that you must know is how to talk to that machine and tell what you want it to do. If you don't know how to tell it, you fail to get your work done from the machine. (48 years, male)*

> *There is a certain area where I think it's difficult for much older people to do on the computer. Because they are the older generations and haven't been brought up to use computers. (67 years, female)*

3.4.2.5 Emotional reactions towards SSTs

Individuals' emotional responses towards the use of self-service technologies are considered here. Love, enjoyment, fear, guilt and feelings of isolation were captured as important. Especially, the young participants were recognised as enjoying the interactions with technologies. Some of the respondents expressed guilty feelings towards SSTs since

they caused to reduce job opportunities and make less interpersonal relationships. It was recognised that older people dislike SSTs since they make them more isolated, without letting them have personal contact with others. The literature shows the significance of some emotional reactions such as enjoyment (Pikkarainen et al., 2004; Curran & Meuter, 2007; Füller et al., 2009), fear (Marr & Prendergast, 1993), need for interaction (Curran & Meuter, 2005; Meuter et al., 2005) etc on customer acceptance of SSTs.

The study reveals that especially younger people love and enjoy self-service technologies.

> *Possibly I think people just really love technology. I think that technology enriches our daily lives. (22 years , female)*

> *Instead of going to the bank, we would get much more enjoyment by switching to the phone and doing that, say online shopping or playing games movies in CDs DVDs. It's quite clever. (28 years, male)*

However, it was witnessed that some people had negative emotional reactions towards self-service technologies, mainly due to fear towards the use of technologies, guilty feelings towards SSTs and feelings of isolation due to performing remote transactions via SSTs.

> *You know we haven't been born with technologies like you. We are actually afraid to use technologies. It is still all right with me to go shopping. (67 years, female)*

> *And people are now less friendly…do not talk much with people. Let's say coffee for instance, when I am drinking coffee, I would like to not only drink, but stay and talk with people. Instead of going to machine, put the money in, press the button. There you are the coffee… that is empty. Do you know what I mean? It just makes us isolated. However, I don't really like it. Coz it is making more impersonal, more cold relationships. (55 years, male)*

> *I do realise that for the much older generation they like face to face transactions. For some older people, perhaps it's the only time they speak to someone in a day. And I think we've got to realise that it can be a very isolating thing by doing online. (62 years, female)*

Probably I would start to feel a little bit guilty. Well, I worry about it putting a lot of people out of jobs. If you are using self-service checkouts at supermarkets.... it means fewer people on tills. It is so mechanized now. (28 years, male)

3.4.2.6 Personal judgements

Individuals' subjective evaluations on the elements of SSTs and their own personalities are considered in this category. Trust, risk, privacy, independence, self-confidence, self-control, external control, voluntariness, and the judgement on resource availability were identified as important personal judgements. The literature provides many evidences of these individual elements, for example, the influence of consumer evaluation of risk (Beatson et al., 2006; Walker & Johnson, 2006; Featherman & Hajli, 2016), trust towards SSTs (Lee & Allaway, 2002), personal control (Wang et al., 2016) etc on the adoption of self-service technologies.

The interview showed a substantial difference in personal judgements between younger and older people. In contrast to the older people, the younger people were identified as trusting SSTs, accepting them as a low risk transaction mode and as securing the privacy of the customers.

I believe (trust) these machines. Because I know, it exactly does what I ask it to do. If there is a problem, it might be with my instructions. I am the boss who asks the machine to do it. It is free from man-made errors. (22 years, female)

You know bank details are confidential. I know many frauds happen if you give these all details to websites. I am not confident about the privacy in there. (58 years, male)

Honestly, I think my bank account is safer than others since I am not doing online banking. That was it. I know how some people cheat with bankcards (risks). I do not want to get that risk. (67 years, female)

Further, a substantial difference was recognised between older and younger participants, with regard to their personal evaluation of the sense of independence, self-confidence and self-control when performing SST transactions.

I feel that I am much more independent with these technologies. Why should I depend on others if I can get things done by myself? I am really happy with it. (25 years, female)

When you are actually buying something, and the final decision is made, I think it is nice if you are able to speak to someone to make sure that you fully understood and made the right purchase and decision (self-confidence). It does not matter if you make an error at the supermarket when you buy some food. But it does matter very much like for health insurance or buying large critical items like a washing machine or fridge freezer. And for something like simple tasks. It's excellent. I can't see any problems there. (62 years, female)

If I am purchasing something, or I am using the money in my bank account, I have the control. I know what is good to do or not. I know the risk and so not use insecure sites. (36 years, male)

Personal views about resource availability, the voluntariness of the service, and external control were also recognised as different from the individual to another.

My view is, this is the development. Sometimes some things might be sacrificed. As a country, technological development is necessary. In my evaluations now, we have enough resources (resource availability) to do self-transactions. (45 years, male)

If you get to the supermarket and you are half way through shopping, any breaks…beyond your control, you have to start again. Just maybe like technical errors... Screen breaks, internet going down, signals not working (22 years, female).

Maybe in internet banking... When the internet is not working... It is not giving you the money …puts your card back out…I think probably with the technology. (45 years, female)

I think still we have a choice,whether we go for counters or machines, sometimes there's nothing can do other than using machines. All tills closed. (50 years, male)

Sometimes they're optional, but sometimes they are mandatory. At Tesco, if it is open late, sometimes no one's serving on the till. So, then you're forced to use automated ones. When I'm buying alcohol or something, I go to the normal checkouts, not the self-checkouts. Just because you'd have to ask them to…see that you've got alcohol. Yeah. If there's something in my normal shopping which might cause, I just go to the normal checkouts. If you go to the petrol station and it's closed, which only has a pump then you must pay with a card. If it's something after hours, you must use self-service options. (38 years, male)

3.4.2.7 Social influence

The study defines social influence as the extent to which individuals perceive the importance of the influences of other people and society. Most of the respondents acknowledged that SSTs are a 'social norm' and their adoption is acceptable. Further, the study recognises that the influence of 'personal sources' such as friends/peers/family members and 'organisational sources' such as employees are important in SST adoption. Further, the study witnessed that young people are more influenced by social factors than older people. Similarly, Venkatesh & Morris (2000); Venkatesh et al. (2003); Curran & Meuter (2007) explain the effect of social influence in intention to change the behaviour in SSTs. Examples of comments made in the present study include the following.

I know... society is changing...we also must accept it and change. (25 years, female)

First, I also was a bit afraid of using them. Once I went shopping with one of my friends, she showed me how to do the stuff...it's nothing, now I do it always. Service staff also direct and help to use self-service checkouts. (22 years, female)

You know, my wife always goes to the till to make payments. When shopping with me, I used to use self-checkouts. Then she realized there's nothing in there, than doing very simple tasks. Now she also goes to self-checkouts. (38 years, male)

3.4.2.8 Situational factors

The study recognised propensity to use SSTs as high when physical service encounters are crowded, when the customer is in a hurry, when the task is simple to perform and

when the customer is alone (not in a group). Similarly, Wang et al. (2012) and Demoulin & Djelassi (2016) also found the significance of situational influences in the customer's choice of self-service technologies. Quotations illustrating this category include,

> *The fuel pumps, I would rather be going and pay. But if it is crowded, I will do it by myself with the machine…so you can choose which one, whether you do it in the machine or go to a till. It depends on, say how big the queue is and how much I am hurry. (50 years, male)*

> *As I said, because if I am in a rush. I'm living in Scunthorpe, finishing work in Grimsby, maybe I need to continue work again or want to have some family time, so I just grab something, go to self-service which is faster and continue with my journey. (48 years, male)*

> *I like to do simple things in machines. (58 years, male)*

> *You know I am staying alone. So sometimes I'm too lazy to go shopping. So now I usually do online shopping. (38 years, male)*

3.4.2.9 Customer demographics

Age was recognised as a key element which influences the effects of many of the above mentioned factors on customer value co-creation intention. This study found that the younger people are conversant with SSTs while the older people still prefer the traditional physical interfaces. Dean (2008) also found that older generation to be less confident in performing with SSTs, although Dabholkar et al. (2003) and Weijters et al. (2007) disagree, finding insignificant differences of age on the use of SSTs. The following quotations from the interviews illustrate the role of age in their attitudes towards SSTs.

> *There is a certain area where I think is difficult for much older people to do things online. Because they haven't been brought up to use computers …however I do think it's the way forward. (62 years, female)*

> *Possibly I think people just really love technology. I think that technology increases our daily lives. (22 years, female)*

Instead of going to the bank, we would get much more enjoyment by switching to the phone and doing that, say online shopping or playing games movies in CDs DVDs. It's quite clever. (28 years, male)

I didn't use my bank, since they closed the branch. She (the bank manager) rang me. She said 'you haven't used our bank for a while'... I said 'No, because you closed the branch down'. She said, 'Well you could do online banking or things like that'...I said, 'Well I don't use it because I feel I don't really need it'. Then she asked, 'What about your bank account'? I said 'I use cheques'. That was it. That is the only thing. Maybe I'll use it for few years... and God knows how long I am going to live....and last. That's it. (67 years, female)

3.4.2.10 Past experience

This study found past experience to be one of the most important factors that directly affects customer value co-creation practices in self-service technologies, rather than determining the intention of using SSTs. This is because, if people have adequate previous experience, they directly go for SSTs without any hesitation. Providing similar signs, Wang et al. (2017) and Castro et al. (2010) identify prior habit as influential in SST usage. Moreover, evidence such as that of Demoulin & Djelassi (2016) supports the importance of previous usage behaviour for SST adoption. Therefore, additionally, this study investigates the effect of past experience on customer value co-creation intention in one of its alternative models. The following are examples of quotations expressing the role of past experience.

I think probably the first once or twice…you feel uncomfortable... Because you see the screen is going mad and shouting. Once you become familiar, then you do not want to worry (45 years, female).

I will always go to self-service. Because I know what I should do in there. It's so much quicker and so much easier. At the same time, if you do not know how the self-service checkout works, you can easily get very confused. However, once you know what to do, it's easy (22 years, female).

A summary of the findings, relevant to influencing factors on customer intention of accepting self-service technologies in value co-creation is provided in the following table.

Table 3. 6: Summary of the factors that influence customer value co-creation intention in self-service technologies

Variable	Factors	Quotations from customer responses
Performance	Usefulness	It's really useful...I can do things straightforward... it's obvious.
	Speed	Very quick…no need to be hanging on things…it's fast.
	Efficiency	Its fine with busy lives, I could do many things since all are at my fingertips.
	Consistency	It's the same whoever, whenever, wherever do it …no bias or favours.
	Cost-effectiveness	It cheap…why should we pay extra money if we can do it?
	User friendliness	Many of them are simple…easy to handle and in clear language.
	Reliability	It's reliable…no human errors, / I am not sure until I receive it in my hand.
	Trialability	We can go up to the last moment, if we don't want we can cancel it. that's all.
Convenience	Locational convenience	I can do many things while staying at my home, living room...or even in bed. Many things are very easy to access.
	Physical exertion	Sometimes you are not travelling, no long queues… actually less effort. It's easy.
	Time convenience	You can use your time ... usually after office hours... it's 24 hours.
Information Richness	Sufficiency	Enough information should be there, otherwise how can we get the right decisions?
	Relevance	All related information should be there …not nonsense.
	Timeliness	I found some information is available in online… but not in the store…they don't update their sites. /some websites are not up to date.
	Accuracy	What they tell should be correct…its free from human errors.
	Clarity	It should be clear to understand for everyone / some instructions mislead you.
	Simplicity	All the instructions should be very simple / I don't know. Some instructions make me confuse.

Technology Know-how	Knowledge of SST devices	Should have a little understanding of how to operate different kinds of machines…it's easy/ we weren't born with technologies like you (older participant).
	Computer knowledge	All in computer screens… if we have basic knowledge of computers, its fine / sorry …I am not good at computer work.
	Knowledge on internet	Everything is online now…this generation (young) is confident with the internet.
	Ease of use	It is not a much difficult task...very simple actions to follow/ some might make you confused.
	Ease of learning	Once you do it, you do it every day...it's really simple…all instructions were given…/ our age (older) is not good at learning new things…
Emotional reactions towards SSTs	Love	I love to work with technologies…its clever.
	Enjoyment	You can enjoy it with your smartphones.
	Fear	I don't know... I am afraid to do it… feeling like I'm not sure what to do.
	Guilt	See … how many are here waiting for jobs…I feel guilty about it.
	Isolation	I don't want to be isolated with SSTs.
Personal judgements	Trust	I trust it…no bias…no errors… / I am not sure until I receive my tickets.
	Risk	I have heard about some frauds in banking…it's a risk …I do not like to use it.
	Privacy	I hope this personal stuff is confidential in there.
	Independence	Yes. really, I am free from many hard works because of this (SST).
	Self-control	Now I have control… it's my own work…my own decisions.
	Self-confidence	Yes, I am confident to do it/ No sometimes I am not confident…especially if it is new to me.
	External control	Things like technology …its failures are beyond me…so I have a hesitation.
	Voluntariness	I think still we have a choice, sometimes there's nothing you can do than using machines. All tills are closed.

	Resource availability	I think this is (resources) enough.
Past experience	Past experience	If once you handle it, then you know what to do/ it might be difficult for the first time.
Social Influence	Personal sources	Sometimes my friends ask, 'Why don't you use this? it is so easy'.
	Organizational sources	They ask me to do online checking…I saw that at the last moment.
	Influence of society	I know… society is changing…we also have to accept it and change.
Situational factors	Crowding	I use automated checkout only if the till is busy with lengthy queues.
	Urgency	If you are in a hurry …better to go with self-service options.
	Task complexity	It's good to do simple tasks… if not better to help from staff members.
	Group or alone	I usually use SSTs when I am alone (not in a group).
Customer demographics	Age	I guess all of you (young) are clever with technologies/ People of my age (older) are not good with technologies.

3.4.3 Customer value co-creation practices in self-service technologies

The other objective of the qualitative interviews was to explore the practices in which customers engage in co-creating value at self-service technologies and identify difficulties/failures associated with them.

The qualitative study found sixteen customer value co-creation practices in self-service technologies. They are, seeking information, sharing information, recalling information, following instructions, providing feedback, producing the service, personalising the service, delivering the service, conforming to requirements, accepting terms and conditions, taking responsibility, changing habits, tolerating failures, connecting with the service employees, preventing errors and recovering errors.

As Echeverri & Skalen (2011) suggest, this research also recognised the duality of these practices as 'value co-creation' and value co-destruction'. Accordingly, the study evidenced how the same practice can result in value co-creation for one person while causing co-destruction to another, mainly based on their (in)abilities, expectations, and situations.

The 'practice theory' was used as the theoretical foundations in recognising customer value co-creation practices. As denoted by (Schau et al., 2009); Echeverri & Skalen (2011), these value co-creation practices were identified with the inherited characteristics; 'understanding', 'procedures' and 'engagements'. In line with Warde (2005), this study also found the importance of past experience in performing value co-creation practices in SSTs, making people more familiar and less attentive towards practices that they perform in an ongoing basis.

Further, this study found that many of these practices have interconnected each other, such that ability/inability to perform one practice may have impact on another and finally determine the overall value co-creation or value co-destruction. These practices were identified as common to many types of self-service technologies (telephone/interactive based, online/internet based, interactive kiosks, CD/DVD based). However, all of these value co-creation practices may not necessarily be seen to the same degree and they may vary slightly with the type of SSTs. For instance, the customer may engage in performing many of these practices in online shopping, while practising only a few activities with interactive kiosks, such as using a vending machine.

The following sub-sections describe these practices with interview quotations that evidence both value co-creation and co-destruction. Further, since the identification of these practices are based on the practice theory, how respondents elaborated on the elements of practices (understanding, procedures and engagement) are also noted in the quotations.

3.4.3.1 Seeking information

This study found, 'seeking information' as an essential practice in using self-service technologies, especially, in online transactions. The expansion of the World Wide Web is renowned as a provision of a vast range of opportunities for information searching. Customer inabilities and inefficiencies in identifying the most relevant information for better decision making is recognised as one of the main reasons for value co-destruction in self-service technologies. The literature shows that 'information seeking' is an activity in co-creation (McColl-Kennedy et al., 2012; Yi & Gong, 2013; Neghina et al., 2015). The following quotations illustrate this issue.

> *We got many chances to know about what we are going to buy...because we have manuals with everything ... go online ...read reviews of others…if you want simple questions and answers you can go to Frequently ask questions… you can see the pictures of it…it is easy to compare with other options (understanding/procedures). So surely, I search for information before I take whatever the decision… (engagement) it has a hell of a lot of choice. (Co-creation) (38 years, male).*

> *What should I say…like this... in self-services we have to learn many things by ourselves. with the given information or search through the internet… their websites (procedures). Sometimes I am not good at searching what I exactly want (understanding). There might be some other better options than what I receive. Why I am saying this, it happened to me many times (engagement)… So, I miss the best option. If I could go and talk with these people, they would recommend me the best option. (Co-destruction) (50 years, male).*

3.4.3.2 Sharing information

Two main types of information sharing were identified in this study; one focuses on sharing personal information such as passwords, bank account information, and contact details with the service provider which is a mandatory requirement to perform the service transaction as a co-operative conduct with the organisation. The other type of information sharing takes the form of sharing views, perceptions and experiences with friends, peers or other social communities in physical or virtual settings. It appeared that younger people do not have much hesitation to share their information/experiences with others, while the older generation is reluctant to do so. Similarly, Yi & Gong (2013) and McColl-Kennedy et al. (2012) recognise 'sharing information' as a behaviour in value co-creation. Illustrative comments include the following.

> *I sometimes write reviews about products (engagement) coz I know that …it's like giving verdicts; read others' reviews before buying something (procedures). It really helps me a lot to get a real picture of the product. That's quite true. Not like advertisements, they are telling what they have experienced (understanding)…. so, I guess what I write might help someone. (Co-creation) (38 years, male).*

> *To be honest, I think I am not. I do not tell my stuff with others (engagement). I guess my opinion may not be valid for others (understanding). I am not good at using these machines (understanding). I don't know how to do it on the internet (procedures/understanding). Sometimes I ask my grandchildren to do them (engagement). (Co-destruction) (58 years, male).*

3.4.3.3 Recalling information

Recalling frequently needed information such as pin numbers, passwords etc also were identified as a simple but important requirement to practise SST transactions. Most of the respondents said that they could remember frequently needed information, while some shared their experiences of service failures due to not recalling relevant information. Equally, Payne et al. (2008) identify the importance of 'remembering' in customer learning in co-creation. The following are examples reflecting this sub-theme.

> *It needs to keep in mind only a few simple pieces of information like passwords, pin numbers (procedures/engagements). It's nothing, already registered in my mind (understanding). (Co-creation) (22 years, female).*

Once my card (ATM) locked (procedures). It was my fault (understanding). I typed wrong pin number for all three times (engagements)...you know I wrote it in a piece of paper and kept in my purse. My bad luck it also went somewhere (Co-destruction) (28 years, male).

3.4.3.4 Following instructions

According to the views of respondents, following instructions is a key task in the successful completion of SST transactions. Since the customer is performing the service in the absence of service employees, all the instructions should be clear and sequential. Some SSTs provide instructions and information in many languages (e.g., checkouts at airports). Many of the self-service technologies were said to provide clear and stepwise information, while some respondents criticised SSTs as inviting errors by providing confusing instructions. This sub-theme is illustrated by the following.

It is all about following instructions (understanding). Everything is shown on the screen. Step by step we can complete the transaction (procedures). You know… pressing buttons, typing few information, selecting things we want (engagements/procedures) it's clear for me I guess, we can follow nicely. (Co-creation) (45 years, female).

Sometimes instructions are confusing (understanding). You know they might have the whole set of instructions that may confuse, and then once you stop pressing the buttons, you've lost the instructions (engagement/procedures) halfway through you think, 'hang on what did it say?' certain instructions are not step by step. Some instructions are inviting mistakes (understanding) Yeah…I understand many. But I don't know where it goes wrong. (Co-destruction) (38 years, male).

3.4.3.5 Providing feedback

This study found, providing feedback as a rare practice among people, even though organisations encourage such behaviour. Accordingly, customer feedback is primarily in limited situations where they experience extreme conditions such as being highly satisfied or dissatisfied with the service. Supporting these outcomes, Yi & Gong (2013) also found 'providing feedback' as a rare customer value co-creation practice in SSTs.

Occasionally we do get things like emails, calls or maybe letters either asking are you willing to fill some information (procedures). Few simple questions to tick (understanding). Yeah, Sometimes I do it (engagement). But it is usually with a company that you're used to do or if there is something special to say like you are very happy or disappointed about their service (Co-creation) (45 years, female).

I fill feedback especially when something is not really working or annoying me (engagement). Otherwise it's just only time-consuming. I do not think they use it productively (Understanding). Once I reported an issue in a very formal way that happened to me and made me very upset… (Procedures/engagement), now it is more than five months. Still, I didn't hear from them. So why should we do it when they ask us to do, if they cannot respond to our matters (understanding). (Co-destruction) (48 years, male).

3.4.3.6 Personalising the service

According to the findings, customers are now provided with many opportunities to personalise their own service in different capacities at self-service technologies. Designing their own birthday cakes, gift items, personalising insurance packages or savings options were given as examples by the respondents. Personalising the service is viewed as important in value co-creation (Rose et al., 2011), customising the offer based on individual's specific needs (Cunningham et al., 2008; Romero & Molina, 2011). The following are examples from the interview.

I fill the application online to get my car insurance (engagement)…saying I am so and so, my car is this, I don't want this option, I want that... it should be within this price limits …then they show me the best option for my request (Procedures). It is simple…this is the same that I can get even if I visit them (understanding). (Co-creation) (58 years, male).

Nothing I did than selecting one from drop-down menus (engagement). But this is not what I really want. If we go for more personalising, it will complicate everything (understanding). It is great if we can ask someone (employee) and make sure what would happen if I go for this option rather than others (procedures).(50 years, male).

You know even if this is my own decision, I do not have all technical knowledge to go for the best (understanding). I can remember many times, after getting the decision I think, oh…no, I should have gone for that… (Understanding/engagement) (Co-destruction) (62 years, female).

3.4.3.7 Producing the service

Respondents disclosed that deviating from the tradition in interpersonal interactions, they needed to produce their own service in SSTs with or without any support from service staff. Further, it was noted that many of these services are routine and therefore previous experience is important in performing them successfully. Literature elaborates customer engagement in service production as important in value co-creation (Lusch & Vargo, 2006b; Etgar, 2008; Terblanche, 2014; Tommasetti et al., 2015).

Let's say simply I use self-check-outs at TESCO... I don't want to stay behind these lengthy queues. just scan the card, and then take around the electronic scanner and scan the foods…finding items, carting, providing PINs and cards, if I want to validate my points (engagement/procedures). It is simple if you know the process (understanding). You save your time. It's easy (Co-creation) (32 years, female).

You see in supermarkets, usually, it creates problems if you have a bulky item (understanding). always the machine goes wrong, says unexpected items, sounding beep beep, or red lights and all (procedures)…so you have to wait for store assistants (engagement). I mean it's really annoying. (Co-destruction) (55 years, male).

3.4.3.8 Delivering service

This study revealed that customers engage with self-delivery of the service and deciding on the delivery options such as when, where and how the delivery should take place in SSTs. Aligned with this finding, Tommasetti et al. (2015) and Frow et al. (2015) note the importance of customer collaboration in service delivery in co-creating value. The following comments reflects this view.

I like doing online shopping. I do buy something at least once a month (engagement). It's easy and quite clever (understanding). You can choose which

day, to which address you want your products to be delivered and might be within a time range even…(procedures) as if you going to go into the shop. (Co-creation) (28 years, male).

After that man (delivery person) went I checked the foods (engagement). The bananas were too much ripen. You know I am worried about it (understanding). It won't happen if I do shopping (engagement/procedures) and see before buying. (Co-destruction) (62 years, female).

3.4.3.9 Conforming to requirements

Fulfilling the basic requirements needed to perform SST transactions is considered here. Many of the respondents pointed out the requirement of producing proof of identification, such as residence address, telephone numbers, email addresses and having their own bank accounts, credit/debit cards as basic requirements to perform SST transactions. Similarly, Tommasetti et al. (2015) acknowledge the need for 'compliance with basics' in value co-creation. Here are some illustrative quotations.

Yes of course. They want to make sure whether we use someone else's cards or wrong information (procedures). You know how many people cheat for cards. I can provide all the evidence because I have my own bank accounts, credit cards, emails and all stuff (procedures/engagement). It is good asking us to verify them. Otherwise, frauds can happen (Co-creation) (45 years, male).

It happened when I was in another country. I wanted to hire a taxi. I didn't know where these places were. You know, I tried to do it online (engagement/understanding). They asked for my phone number. It was mandatory (procedures). My number was not working there. I had only WhatsApp. They did not accept that number and couldn't do that. (Co-destruction) (36 years, male).

3.4.3.10 Accepting terms and conditions

Accepting terms and conditions is also remarked as an essential activity in accomplishing various SST transactions. Many of the online and internet-based self-services cannot be performed without accepting relevant terms and conditions. It is evident that generally, people accept these conditions in order to proceed with the transaction, without understanding them in detail. In similar contexts, McColl-Kennedy et al. (2012) identify

the prerequisite of 'accepting information from the service provider' as significant in value co-creation.

> *I think from my personal point of view, obviously, we must carefully read and understand what it says (procedures/understanding) and then good to accept terms and conditions (engagement) coz I found some cases it has been written somewhere even if we haven't noticed it…I think it usually keeps you upright. (Co-creation) (50 years, male).*

> *I guess like me all of you agree to those terms without reading anything in it. I don't know whether anyone reads it…how can you read them all? We just agree since we cannot proceed otherwise (understanding, engagement). At the end we don't know what we agreed to. After something happens, then they will say, didn't you see that condition? (procedures)…coz I experienced such situations. I couldn't say anything against them because it was totally my negligence. (Co-destruction) (38 years, male).*

3.4.3.11 Taking responsibility

According to customer responses, the attitude of taking responsibility for service transactions is identified as important co-operative behaviour in SSTs, since the outcome is self-generated. Tommasetti et al. (2015) recognise 'responsible attitude' while 'responsible behaviour' is viewed under the customer participation behaviour in value co-creation (Yi & Gong, 2013).

> *Again, we must be confident to get the responsibility (understanding), because I am the one who did it (engagement). From my experience I know that literally, it works if we do it in the proper way. Anyway, no worries if mistakenly you receive a wrong one…you can change it or go for another option later (procedures) (Co-creation) (25 years, female).*

> *I'm never quite 100% certain that I have done everything right until the rail ticket arrives or whatever has got confirmation (understanding). It's certainly while I actually get the ticket physically in my hand or can see the proof. Once I booked a train ticket online (engagement) and they asked me to wait 24 hours since it had not been updated in their system (procedures). Anyway, I did not receive it. So, I had to cancel it and go and buy another one (engagement). I had to wait many*

days till the refund money got to my account. I am a bit worried to get that responsibility…it is better to go and take it from the counter so that I have no need to wait and see whether it proceeds well or not. (Co-destruction) (58 years, male).

3.4.3.12 Changing habits

Changing behaviours from using traditional service interfaces to technologically advanced operations has been identified as an essential co-operative behaviour of customers. The study identifies the younger generation as more cooperative in changing habits towards adopting SSTs than the older age groups. Providing similar findings, McColl-Kennedy et al. (2012) recognise 'changing ways of doing things' as important in customer value co-creation.

Earlier I didn't use them. I was like feeling odd to use self-checkouts (understanding). But after using once (engagement), I realised there's nothing special in there than doing a simple thing (understanding/procedures). Now I've got into the trend. (Co-creation) (38 years, male).

Technology is changing day by day. Have many to learn (understanding). I don't want to learn and do. This is enough for me (engagement). (Co-destruction) (67 years, female).

3.4.3.13 Tolerating failures

Tolerating failures is also viewed as an important co-operative behaviour of customers when performing self-service transactions with technologies, especially in the event of service delays or failures. This study found that people usually become getting stressed and annoyed with unexpected service delays and failures. Literature provides evidence by identifying 'tolerance' as one element in 'customer citizenship behaviour' in value co-creation (Yi & Gong, 2013). The role of tolerance is expressed in these examples.

What you need is patience… have you seen some people getting confused with machines (understanding). It (self-service checkouts in supermarkets) is telling you to scan your items, scan your card, and scan your point card (procedures). Then people see everywhere. Where is my card? Checking pockets, bags all (engagement). Some people are getting angry with the machine. 'Patience' is so important, for me personally (Co-creation) (45 years, female).

I think there is more stress than any happy moments when you use it (SSTs). Just because, you do something without any help (understanding) …often no person dealing with you (procedures/engagements). Quite literally annoying, if it's going slower than planned. It's a stress really. (Co-destruction) (48 years, male).

3.4.3.14 Connecting with service employees

Connecting in SSTs is outlined as, 'connecting with the service organisation when required'. This is largely because customer relationships with the service provider in the SST context is recognised as limited to situations where customers face problems or difficulties in SST performance. Randall et al. (2011) identify 'connection' as a construct of co-creation, whereas Kristensson et al. (2008) recognise that the poor connections in SSTs leads to less understanding of the customers' real requirements.

Most of the time I have seen there is some service staff hanging around to help with customer problems (understanding). In the supermarket, I had many times my self-checkouts having problems, when it indicates red (procedures), one of the staff members who is walking around the area, approaching to help (procedures/engagement). In many other cases, we can contact them by simply ringing or just sending an email (procedures). (Co-creation) (32 years, female).

I remark that much older generation; we like to face to face transactions. For some older people perhaps, It's the only chance to speak to someone in a day. And I realised they can't be isolated by doing online, especially at home. (Understanding). It is usually that's difficult to find how to contact a human being. Unless it's a shop and you can go find someone. But usually, in online or if it's a bank or a hotel, we have to contact through phone (engagement/procedures). See how hard to find a phone number that connects you to a person rather than an automated answering service (procedures), so you almost feel like they've got all these services up and running and you almost feel like there's no human being behind it. (Co-destruction) (62 years, female).

3.4.3.15 Preventing errors

Respondents pointed out that many SSTs typically indicate possible errors and provide warnings so that customers can early recognise and respond to such warnings to prevent

errors. Aligned with this study outcome, Shin et al. (2017) note the needs for proactive customer behaviours in preventing service failures. Examples provided by participants include the following.

> *Once I typed the wrong PIN (engagement). It indicated that I had provided the wrong PIN (procedures). So, then I made it correct (engagement). I know that normally it gives two or three chances to make any corrections (understanding). It highlights wrong information in red to get our attention. So still we have a chance to correct it. (Co-creation) (45 years, female).*

> *It's my fault, I didn't notice it (understanding) and did the same over and over again (engagement). They (ATM) blocked my card (procedures). (Co-destruction) (36 years, male).*

3.4.3.16 Recovering errors

If errors occurred, possibilities for recovering them at the time of occurrence or within a relatively short time period were pointed out by the respondents. Respondents showed the potential in SSTs to recover errors by simply cancelling the process or through different mechanisms during the interactions with the service firm. Dong et al. (2008) discuss the service recovery in co-creation from the customer's standpoint, and Hilton & Hughes (2013) emphasise the need for service employees to perform 'self-service recovery' tasks in SSTs.

> *Usually with the cancellation button, and also the helpline, so we can correct it at the same time (procedures). It is like, sometimes with less information we order some products, but it is not what I really expected. If we do not feel happy, we can return (procedures/engagement). I have done it many times. It is totally accepted (understanding). In services, say accidently if I transfer some money to another account, I mean to a wrong one. Still, I can inform it to bankers. They will act on it. But it takes time. (Co-creation) (45years, male).*

> *In many situations responses to recoveries are only by email (procedures). It takes more time. They may respond within 48 hours (understanding). 48 hours is a long time. If they do not respond, you have to send another one (email) (engagement). it is another 48 hours. It is not instant. (Co-destruction) (55 years, male).*

Table 3.7 illustrates this categorisation of value co-creation practices in self-service technologies with quotations from customer responses on both value co-creation and co-destruction aspects.

Table 3. 7: Summary of the value co-creation practices

	Co-Creation	**Co- Destruction**
Value practice	**Examples of interview quotations**	**Examples of interview quotations**
Seeking Information	Going through online, websites, FAQs ...like searching through smartphones. I pads…	No. I am not good at searching what I exactly want.
Sharing Information	In online …writing your reviews to blogs. Let others view your experiences…yeah. that's fine	I do not like to share my information with others unless it badly hurts me.
Recalling information	We have to keep simple information like password, PIN number in mind…I am good at that	Once my card (ATM) locked, it is my fault I typed the wrong PIN number for all three times.
Following instructions	Mostly we do these transactions through the internet. Nothing than following the instructions	I don't know why. Certain instructions are not clear for me and make me confused. Some instructions are inviting mistakes.
Providing Feedback	I do like providing feedback. I get emails saying regarding feedbacks/ experience or can you review your experience.	Very rare...I think that they don't use our feedback. Its just a waste of time
Producing the service	just scanning, finding items… connect your card... press PIN...get your money, carting… put your things… move your things across…I can do them all by myself	Sometimes there are some things you can't buy… Say tickets…cigarettes, alcohol…If something goes wrong, the machine is shouting…So I like a till.
Personalizing the service	Especially like insurance, I can say I don't want this option, want to have this…I'll only go for this amount.	If you start to personalize things you are going to make it more complicated.
Delivering the service	You can choose what day you want your food… to where to be delivered and exactly what time duration.	Staying at home, looking forward till they deliver the goods is also time taking and boring.

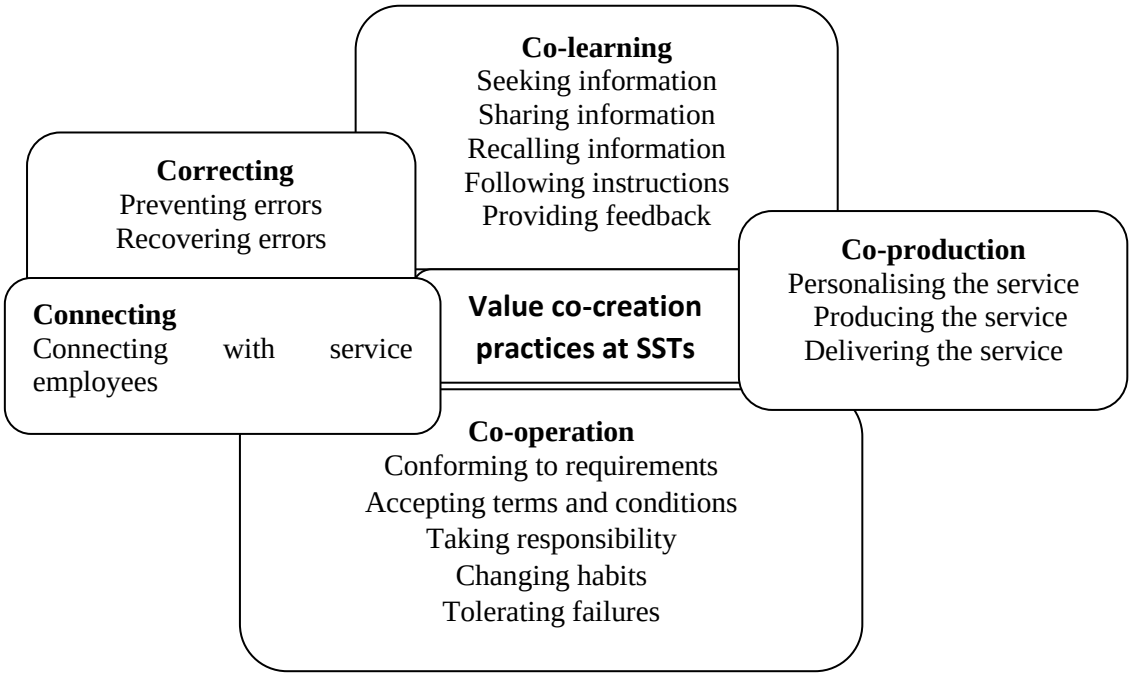
Conforming to requirements	I can fulfil the basic requirements to perform SST transactions coz I have my own identity proofs, own emails/bank accounts etc.	Sometimes I find it difficult to complete SST transactions due to not meeting what they expected me to have.
Accepting terms and conditions	There are terms and conditions …say we agree and move to next stages.	Who reads all these terms? It's unfair.
Taking the responsibility	Again, we have to be confident to get the responsibility …This is a result of our own selection.	How can I take the responsibility for this unseen thing? Better to go and see before purchasing.
Changing habits	Earlier I didn't use them. But now I've changed to the trend. This is what society wants	Technology is changing day by day... I don't know when God will call me... this is enough for me. (No need to change)
Tolerating failures	What you need is patience…and have you seen some people get confused with machines?	It's always a stress (problems). I hate seeing 'out of order'
Relating with the service employees	Even if we deal with SSTs, still we can connect with the company if necessary.	When I want to call a person, I am irritated when hearing an auto recorded voice.
Preventing errors	If once we type the wrong password, it indicates. We have to be alert, then nothing bad will happen.	It's my fault, I didn't notice their red light and did the same and they blocked my card.
Recovering errors	Usually with the cancellation button. And there also should be a helpline, or at least after informing to the company.	Oh no. It takes at least 48 hours... it's too long.

3.4.4 Grouping customer value co-creation practices in SSTs

Considering the consistency and uniformity of the practices, the above identified sixteen value co-creation practices in SSTs have been classified into five common themes (5Cs of co-creation) as Co-learning (seeking information, sharing information, recalling information, following instructions, and providing feedback), Co-producing (producing the service, personalizing the service and delivering the service), Co-operating (conforming to requirements, accepting terms and conditions, taking responsibility, changing habits and tolerating failures), Connecting (connecting with service employees) and Correcting (preventing errors and recovering errors). Though these sixteen practices were categorised into five conceptual groups of practices; it has been recognised that some of these practices are interconnected each other, such that the performance of one factor may affect another one or more, determining the overall success or failure of the value co-creation process.

These value practices are discussed in detail in the discussion chapter, by comparing with the available literature. The following figure illustrates the re-classification of value co-creation practices in SSTs.

Figure 3. 3: Re-classification of value co-creation practices in SSTs



3.4.4.1 Co-producing

The interpretation of co-production in this study resounds with Auh et al. (2007:361) definition, "Constructive customer participation in the service creation, production and delivery process". This study found service co-production as an essential component of value co-creation at self-service technologies whereas other co-creation practices surround it to confirm its success. It was observed that, apart from the service co-production, customers need to go through many pre and post activities in co-creating value in SSTs. This study recognises that customers are involved with 'producing', 'personalising', and 'delivering' the service, which is categorised as the three main components of co-production in the SSTs. Similarly, Tommasetti et al. (2015) categorise co-design and co-delivery as elements of co-production, while Frow et al. (2015) propose co-design, co-production and co-distribution amongst the twelve forms of value co-creations.

3.4.4.2 Co-learning

This study views co-learning as, 'collaborative learning through the use of technologies and human interactions, enabling enhancement of knowledge of individuals and the society'. This research identified five co-learning practices in SSTs: seeking information, sharing information, recalling information, following instructions, and providing feedback. It is noted that with the exemption of 'feedback', the other four remaining factors are highly important in customer value co-creation, since if competencies fall short in these learning practices, it may result in value co-destruction. Some respondents stated that their inability to search the most suitable information for correct decision making and incapability of following instructions were common causes of unexpected value co-destruction. Providing feedback is recognised as a very rare practice that takes place typically in situations where customers experience extreme conditions such as being extremely dissatisfied or delighted with the service. Supporting this classification, McColl-Kennedy et al. (2012) recognise 'actively seeking and sharing information' as co-learning while Tommasetti et al. (2015) added 'feedback' as another component of co-learning.

3.4.4.3 Co-operating

Following McColl-Kennedy et al. (2012); this study define co-operation as 'adherence to the prerequisites and preparation for the collaborative work'. Five components of co-

operation were identified: conforming to basic requirements, accepting terms and conditions, taking responsibility, changing habits and tolerating failures. As noted in the findings, this study evidenced that lack of customer co-operative behaviours caused value co-destruction. Providing related evidence, McColl-Kennedy et al. (2012) identify the significance of co-operation as an activity in value co-creation, identifying 'accepting information from the service provider,' 'changing ways of doing things' and 'compliance with basics' as examples.

3.4.4.4 Connecting

This study identifies 'connecting' in SSTs as, "connecting with the service organisation when required" whereas Tommasetti et al. (2015), view connection as 'building and maintaining relationships' in interpersonal interactions. Further, this study recognises that customer relationships with the service provider in SST contexts are limited to situations where customers face problems or difficulties in SST performance. The findings show that inability to connect with service staff when necessary caused annoyance and value co-destruction. Automated voice messages given by SSTs, instead of enabling customers to connect with service staff make customers more stressed. Connecting has been viewed as an element of value co-creation (Randall et al., 2011; Tommasetti et al., 2015).

3.4.4.5 Correcting

This study put forward 'correcting' as an important value co-creational element in SSTs and defines it as "preventing errors from adhering to the precautions and obtaining recovery actions when necessary". Responding to the warning messages and alarms in SSTs is recognised as a vital mechanism of error prevention. If errors occur, working towards recovering through different mechanisms is identified as important in the overall value creation process. Many of the respondents stated that their negligence led to unexpected failures, mostly resulting in value co-destruction. Further, most of the respondents were unhappy with the poor recovery skills and long-time taken by service firms in providing corrective actions. Shin et al. (2017) recognised prevention of service failures while Dong et al. (2008) identify the need of service recovery in co-creation in self-service technologies.

3.4.5 Interconnectivity of value co-creation practices

This study recognises the interconnectivity of value co-creation practices such that the way of performing one activity causes another one or more activities. For an example, if a person can search for correct information and/or follow instructions properly, it may enable them to perform the transaction/or personalise the service successfully, resulting in less need for error prevention or recovering. Therefore, the final outcome is a result of many interconnected practices which determine the overall failure or success.

Supporting this view, Stieler et al. (2014:72) note that one reason for failures in value co-creation can be easily caused by another, creating risks and negative outcomes. Similarly, Schau et al. (2009:31) stated "Practices are linked and implicit ways of understanding, saying and doing things" while Reckwitz (2002) view, practices can be decomposed into several interconnected elements.

3.4.6 Differences of practices with types of SSTs, personal and situational factors

These practices were recognised as common in many types of SSTs, yet all of them may not necessarily be seen to the same degree and they may vary slightly with the type of SSTs. For instance, the customer may engage in performing many of these practices in online shopping while practising few activities with interactive kiosk such as using a vending machine. Although previous studies have not focused on understanding customer value co-creation practices in SSTs, Blut et al. (2016) found differences in accepting SSTs based on their type.

Further, it was found that although these are typical customer value co-creation practices in SSTs, not every individual needs to perform every practice in co-creating value with SSTs. Instead, it may vary based on their previous experience, requirement etc, allowing customers to skip some of the practices. For an example, no need to search information, if the customer is already aware on the suitable decision. Supporting such a view, Sandström et al. (2008) found the dimensions of value co-creation to be personal to every individual. Further, it appeared that as Warde (2005) explained, many of these practices are routine behaviours, where more experienced people are less mindful in practising them. Additionally, performing these practices may vary with the situation, such as whether the customer is in a hurry or the transaction is simple or complex. In complex transactions customers tend to go through many steps, whereas they purposefully skip some practices in routine and simple behaviours.

CHAPTER THREE - SECTION FIVE

QUANTITATIVE RESEARCH DESIGN

3.5.1 Introduction

This section explains the design of the second part of the study, the quantitative element. As Sekaran (2006) and Sekaran & Bougie (2016) suggest, the quantitative study design begins with explaining the purpose of the quantitative study, the type of data and data collection methods, the data collection instrument and period, the study setting, the time horizon, the unit of analysis, the extent of researcher interference, the target population and sampling strategy.

Next, the chapter moves on to explain specific areas of quantitative research designing. such as the development of the conceptual framework and hypotheses, defining operational variables and generating items, the questionnaire development process and finally, the data analysis procedure. For the sake of convenience and the flow of information, section- 5 is subdivided into four parts as follows.

Part-1 - Conceptual framework and hypotheses development

Part 2- Operational definitions and item generation

Part 3- Questionnaire development

Part 4- Data analysis procedure

3.5.2 Purpose of the study

The aim of conclusive research is recognised as "to describe specific phenomena, to test specific hypotheses and to examine specific relationships" and classify into two sub-categories as 'descriptive research' and 'causal research' (Malhotra & Birks, 2007:72). Descriptive research aims at describing the characteristics of a certain population (Sekaran & Bougie, 2016) using scientific analysis procedures to test hypotheses (Hair et al., 2003) and mainly evaluates frequencies, relationships etc. (Shukla, 2008). These types of research are characteristically more formal, structured and based on large, representative samples (Malhotra & Birks, 2007). Descriptive research designs are

common in marketing and based on previous evidence or an extension of an exploratory research (Shukla, 2008).

Based on the above descriptions, this study (study part two- quantitative study) is recognised as 'conclusive' in nature and aims at describing characteristics of the study phenomena and testing hypotheses in order to generate statistically valid results.

3.5.3 Type of data

Data can be collected through 'primary' or 'secondary' sources, where primary data refers to first-hand data collected to solve the problem at hand, and secondary data are data already collected for another reason (Sekaran, 2006). There are four main primary data sources; individuals, focus groups, panels and unobtrusive methods. This study used primary data, collected from individuals to achieve the research objectives.

3.5.4 Quantitative data collection method

The quantitative approach aims to test pre-determined hypotheses and produce generalizable results (Marshall, 1996). In achieving that, determining the appropriate data collection method is vital (Sekaran & Bougie, 2016). Among the different kinds of quantitative data collection methods, the survey is very common in marketing and involves questioning respondents on the issue at hand to obtain specific information (Shukla, 2008). Unlike explorations used in qualitative methods, surveys do not rely on subjective expertise such as the communication, moderation and interpretation skills of the researcher. It allows accommodation of large samples and therefore provides the chance to ensure the generalizability of the findings by performing advanced statistical methods (Shukla, 2008). Surveys can be classified according to the 'contact mode' (how the respondents are contacted), the 'response mode' (how they are asked to complete the survey), and the 'follow-up mode' (how subsequent communication is conducted) (Fricker, 2008:207).

In this study, a field survey was conducted with 'self-administered' questionnaire as the main data collection process. Prior to the main survey, expert reviews and a pilot study were performed to test some aspects of the questionnaire, such as comprehensibility, relevance, flow etc. Based on the outcomes, improvements were made to the questionnaire before moving to the field study. The findings of the expert review and the

pilot study are discussed in detail, in the below subsection of 3.5.3.1.10: ‘Eliminate problems by pilot testing’.

3.5.5 Data collection instrument

There are three main data collection methods in survey research: interviewing, structured observations and administering questionnaires, where the survey questions are typically organised into a self-administered method that the respondent should complete by him/herself (Sekaran & Bougie, 2016).

This study used questionnaires in data collection and designed in a way that self-administered by the respondent. A self- administered questionnaire is a stand-alone questionnaire designed with the purpose of allowing respondents to complete it without the intervention of the researcher (Lavrakas, 2008). As Wolf (2008) advised, special attention was given to avoiding measurement error and to the format of the questionnaire, since it was expected to be filled by the respondent without ongoing instructions by the researcher.

3.5.6 Data collection period

Data were collected for the main survey from January to April 2017. Before that, expert reviews were taken in October/November 2016, and subsequently, the pilot study was conducted in December 2016. The field survey went through four months and data entering to the software was started during the data collection process after receiving the considerable number of questionnaires.

3.5.7 Study setting

Two types of study settings have been identified as ‘contrived’ and ‘non-contrived’ environments (Sekaran & Bougie, 2016). The natural environment of the respondent, where their normal day to day activities take place, is known as non-contrived environment whereas the contrived environment represents artificial or laboratory types of settings. Generally, correlational studies in which the independent variables are not manipulated by the researcher taken place in natural settings, which are termed as ‘fields’, while some causal research is more suitable for controlled settings. This study aimed at

uncovering relationships (descriptive study) without controlling any variables, and therefore a non-contrived environment (field) was preferred as the suitable study setting.

3.5.8 Extent of researcher interference

Researcher interference with the normal flow of the data collection stage mainly depends on whether the study is causal or correlational (Sekaran & Bougie, 2016). Typically, correlational studies take place in a non-contrived environment, with a minimum interference of the researcher. However, causal studies need the researcher to interfere since some variables need to be manipulated deliberately by the researcher. Since this study is the correlational type, the researcher's interference was kept at a minimal level.

3.5.9 Unit of analysis

Unit of analysis refers to the "level of aggregation of the data collected during the subsequent data analysis stage" such as 'individuals', 'dyads', 'groups', 'organisations', 'machines' (Sekaran & Bougie, 2016:96 & 102). Individuals represent single units as customers, employees etc. 'Dyads' are mainly used when the researcher wants to study two-person interactions (husband-wife, supervisor-subordinate) and 'groups' denote situations when the researcher aggregates the individual data into group data for making ease the comparison, such as different departments in an organization (Sekaran & Bougie, 2016). This study collected data from different SST users and therefore 'individuals' are the unit of analysis in this study.

3.5.10 Time horizon of the study

The time horizon of a study can be either 'cross-sectional' or 'longitudinal' (Sekaran & Bougie, 2016). Cross-sectional studies are common in marketing (Shukla, 2008) and involve collecting data from the sample providing snapshots at a time. It is gathered just once, but this can take place over a period such as several weeks or months (Sekaran & Bougie, 2016). Longitudinal studies are conducted in several times, measuring a fixed sample repeatedly to monitor the changes over a period (Shukla, 2008). Considering the research objectives, nature and types of research questions, this study was conducted only once in the sample and therefore is 'cross-sectional' in nature.

3.5.11 Target population

The population refers to the 'entire group of people, events or things that the researcher wishes to investigate' (Sekaran & Bougie, 2016:236). Practically it is impossible to collect data from the entire population, due to the limitations of time, cost and other resources. Therefore, a researcher has to select a representative group of elements from the population (a sample) to produce more reliable results, generalizable to the entire population.

The target population of the study is people in the United Kingdom who are above eighteen years old and use at least one of the self-service technologies in their lifetime.

3.5.12 Sampling method

Sampling is a "process of selecting a sufficient number of the right elements from the population" (Sekaran & Bougie, 2016:239), in securing the criteria that information gathered from the small group will accurately judge the larger group (population) (Shukla, 2008) and therefore the 'sample' is a subset of the population (Sekaran & Bougie, 2016). Achieving generalizability through obtaining a representative sample and dealing with non-response bias is the primary goal of a quantitative study (Bartlett et al., 2001). The sole purpose of quantitative sampling is to draw a representative sample (Marshall, 1996), because, a study will be useless if data collected from the sample cannot provide correct answers to solve the problem at hand (Sekaran & Bougie, 2016).

The two major sampling techniques are 'probability sampling' and 'non-probability sampling' (Sekaran & Bougie, 2016). Probability sampling provides an equal chance to all elements in the population to be selected to the sample (Marshall, 1996). Simple random sampling, systematic sampling, stratified random sampling and cluster sampling are the common types of probability sampling (Shukla, 2008; Sekaran & Bougie, 2016). However, this study did not adopt with the probability sampling technique, since lack of sampling frames which demonstrates the exact elements of the populations (Hair et al., 2003).

This study adopted the non-probability sampling method, although elements in the population do not have a predetermined equal chance of being selected to the sample (Sekaran & Bougie, 2016). As is common in many studies, this method was selected considering matters such as time, cost, sampling frames etc (Sekaran & Bougie, 2016).

Further, it is accepted in social science when decision makers want to obtain a rough idea about the population rather than precise decisions (Shukla, 2008). Among the different types of non-probability sampling techniques: convenience sampling, judgmental sampling, quota sampling and snowball sampling (Shukla, 2008); this study is based on the 'snowball sampling method'.

Snowball sampling is known as 'network sampling' (Gabor, 2007) is a type of purposive sampling where existing participants recruit future subjects from their referral (Oliver,2011). This method is common in surveys (Dragan & Maniu, 2012) and defined as "a form of non-probability sampling in which the researcher begins by identifying individuals perceived to be an appropriate respondent, and these respondents are then asked to identify another potential respondent and this process is repeated until the researcher has collected sufficient data" (Oliver & Jupp, 2006:2). Even though snowballing sampling is generally accepted as suitable to identify rare/hidden populations or respondents whom their behaviours are socially unacceptable (Anderson, 1986; Browne, 2005; Oliver & Jupp, 2006; Dragan & Maniu, 2012), there were many research work in marketing (Gabor, 2007; Dragan & Maniu, 2012) and especially in the value co-creation context (Truong et al., 2012; Paredes et al., 2014; Greer, 2015; Chowdhury et al., 2016; van Woezik et al., 2016) that used snowballing as the sampling technique. Considering the previous practices in marketing and value co-creation research contexts and especially considering the convenience of reaching multiple respondents, this research used non-probabilistic snowballing sampling technique in selecting the sample for the study.

3.5.13 Sample size

Determining the sample size is a compromise between resource availability and the level of accuracy of information collected (Shukla, 2008). There are several qualitative and quantitative criteria for deciding the sample size. Factors such as "nature of the research and expected outcome, the importance of decisions to the decision maker, number of the variable being studied, the sample size in similar studies, type of analysis and resource constraints" are the major qualitative considerations in deciding the sample size. Quantitative measures such as "variability of the population characteristics, the desired level of confidence, the desired degree of precision in estimation population characteristics" are prominently used in determining the sample size (Shukla, 2008:58). Malhotra & Birks (2007) suggest referring to the nature of the study, number of research

constructs/variables, type of analysis method, resource constraints, the typical rate of completion etc. in deciding upon the sample size. Further, it should be determined in such a way as to enable valid inferences to be made about the population (Marshall, 1996).

There are sound mathematical and statistical methods to calculate the sample size for studies which are based on probability sampling (Bartlett et al., 2001) and a number of rules and guidelines available in determining the sample size when performing data validation methods such as factor analysis, structural equation modelling etc (Hair et al., 2013). Hair et al. (2013) propose 1:5 to 1: 10 items to response ratio. Around 300 respondents (DeVellis, 2003) or 200 respondents (Hinkin, 1998) have been proposed as appropriate. Marshall (1996) notes that the optimum sample size depends on the parameters of the phenomenon under study. Tabachnick & Fidell (2013:613) suggest having a sample size of over 300. Field (2013) also suggests over 300 cases is adequate. In line with the endorsements of previous research work, 800 questionnaires were distributed with the purpose of achieving a good sample size, and finally reached 493 usable questionnaires.

CHAPTER THREE - SECTION FIVE - PART ONE

CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

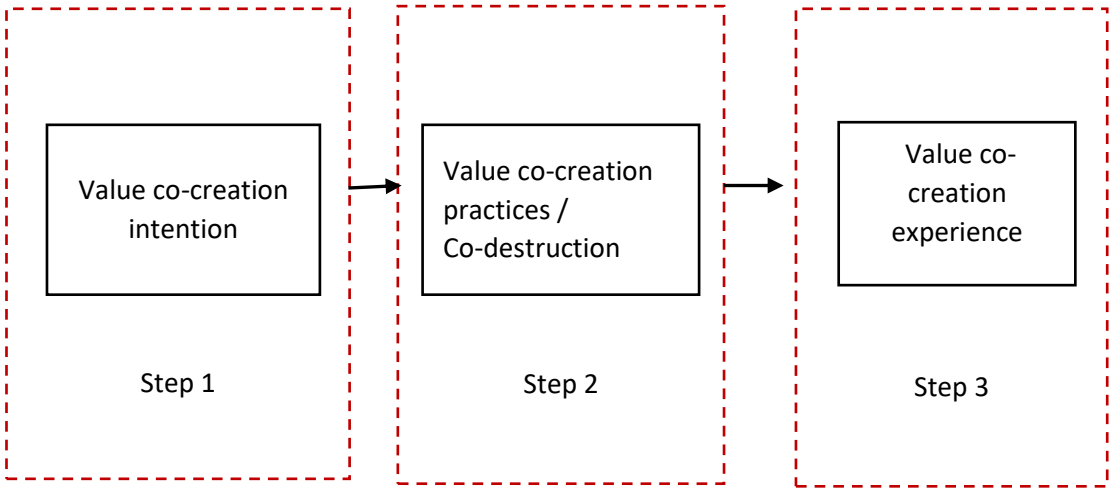
3.5.1.1 Introduction

This section explains the development of the conceptual model, beginning with discussing the logical flow of the study, which explains the basic interconnections among research inquiries. Next, the network of relationships among antecedents and outcomes is illustrated in the conceptual model. Finally, hypotheses are developed to measure the interconnections as illustrated in the conceptual framework.

3.5.1.2 The logical flow of the study

This study examines the relationships among customer value co-creation intention, practices and experience in self-service technologies. In so doing, it first assesses the consumers' value co-creation intention, followed by an assessment of the co-creation practices which lead to customer co-creation experiences. Figure 3.4 visualises the basic logical flow of the research.

Figure 3. 4: Logical flow of the study



3.5.1.3 Conceptualizing customer value co-creation intention in self-service technologies

Since available literature has not adequately addressed customer value co-creation intention in self-service technologies, this study conducted a qualitative inquiry prior to the quantitative survey, to explore the customer value co-creation intention in SSTs. The following hypotheses were developed based on the qualitative research findings (see Part-4 of Chapter Three- Qualitative study findings), compared with the available literature which is discussed in detail in Chapter Five (Discussion).

Performance: SST Performance is recognised as 'the degree to which using SSTs provide benefits to customers in performing certain activities' (adapted from Venkatesh et al. (2012:159) and an important determinant in customer value co-creation intention in SSTs. Similarly, 'performance expectancy' (Venkatesh et al., 2003), 'Performance' (Dabholkar & Bagozzi, 2002) has been recognised as important in technology adoption including SSTs. As noted in the qualitative study findings, eight elements of performance were recognised: usefulness, speed, the efficiency of transactions, consistency, cost efficiency, user-friendliness, trialability and reliability. The qualitative enquiry found that the effect of performance often differs with age, such that young people have greater confidence in performing at SSTs. Further, the literature discusses age as influential in technology adoption (Morris & Venkatesh, 2000; Venkatesh et al., 2000; Venkatesh et al., 2003).

Based on this, the following hypothesis was developed to examine the effect of performance on customer value co-creation intention.

> **H1a:** The effect of 'performance' on customer value co-creation intention in SSTs is moderated by age, such that the effect is stronger for younger individuals.

Convenience: Convenience is recognised as the 'degree of ease associated with SSTs' and locational convenience, time convenience and less physical exertion are recognised as three main convenience factors accompanying SSTs. Further, it was found that especially the younger people are more convenience oriented than older people. The effect of convenience on consumer adoption in SSTs was discussed in previous research work such (Marr & Prendergast, 1993; Beatson et al., 2006; Lin & Hsieh, 2011; Wei et

al., 2017a). The following hypothesis is designed to examine the effect of 'convenience' on customer value co-creation intention in SSTs.

> **H1b**: The effect of 'convenience' on customer value co-creation intention in SSTs is moderated by age, such that the effect is stronger for younger individuals.

Technology know-how: This study outlines technology-know-how as 'general technical knowledge which is required to perform in SSTs and ease related to gathering and using that knowledge'. As participants disclosed, a fair understanding of general technological interfaces, knowledge of the internet, knowledge of computers and ease of gathering this knowledge and applying this knowledge though practical use of SSTs are important in determining their co-creation intention. Further, as the qualitative study found, these technological competencies differ with the age, the older population being less conversant with technology-know-how. In similar contexts, the 'consumer's skills and experience' (Hilton et al., 2013), abilities (Meuter et al., 2005), ease of use (Dabholkar, 1996) ease of use' including ease of learning to use (Curran & Meuter, 2005) were discussed as particularly important in SST adoption. Especially, Dean (2008) shows that the older generation have less confidence in performing SST transactions. Additionally, Venkatesh et al. (2003) show the effect of age on 'effort expectancy' (including 'ease of use' and 'ease of learn') on technology adoption. The following hypothesis aims to test the effect of technology-know-how on customer value co-creation intention in SSTs.

> **H1c:** The effect of 'technological know-how' on customer value co-creation intention in SSTs is moderated by age, such that the effect is stronger for younger individuals.

Personal judgements: Personal judgement is outlined in this study as 'individual's subjective evaluations of the elements of SSTs and their own personalities'. As noted in the qualitative study findings, trust, risk, privacy, independence, self-confidence, self-control, external control, voluntariness and personal judgment on resource availability were identified under this. Literature discussed the effect of several individual elements such as risk (Walker & Johnson, 2006; Featherman & Hajli, 2016), personal control (Lee & Allaway, 2002) and trust (Wang et al., 2016) . As noted in the qualitative study findings, especially young people were recognised as more confident in performing in SSTs, presuming they secure their privacy and provide a sense of independence. In contrast,

older people fund to be less confident and to consider SSTs as a risk and a threat to their privacy.

The following hypothesis is developed to test statistically the effect of personal judgements on customer value co-creation intention in SSTs.

> **H1d:** The effect of 'personal judgements' on customer value co-creation intention in SSTs is moderated by age such that the effect is stronger for younger individuals.

Emotional reaction towards SSTs: 'Individuals' emotional responses towards self-service technologies' is considered here. Love, enjoyment, fear, guilt and feelings of isolation with SSTs were captured as important. Aligned with these research findings, enjoyment (Pikkarainen et al., 2004; Curran & Meuter, 2007; Füller et al., 2009), fear (Marr and Prendergast, 1993), need for human interactions (Dabholkar, 1996; Lee, 2017) were recognised as important in SST trial/adoption. Further, it was found that these emotions vary with age such that younger people love and enjoy SSTs, while older people feel much fear, guilt and isolation with SSTs.

> **H1e:** The effect of 'emotional reactions' on customer value co-creation intention in SSTs is moderated by age such that the effect is stronger for younger individuals.

Social Influence: This study describes social influences as "the extent to which individuals perceive the importance of influences of other people and the society" (adopted from Venkatesh et al. (2012:159). The study identified three kinds of social influences, especially from personal sources like peers, family and friends, organisational sources such as service employees and societal factors like social norms/trends. Most of the respondents acknowledged that the use of SSTs is a 'social norm', and so their adoption is acceptable. The influence of service organisations/employees on use of SSTs takes the forms of both a supportive hand and a forced behaviour as pointed out by respondents. Venkatesh et al. (2003) examined social influence in general technology adoption and Curran & Meuter (2007)for SSTs particularly. The following hypothesis is developed to test the effect of social influence on customer value co-creation intention in SSTs.

> **H1f:** The effect of 'social influence' on customer value co-creation intention in SSTs is moderated by age such that the effect is stronger for younger individuals.

Information richness: The quality of the given information/instructions is acknowledged in this category. The study identifies that the information/instructions provided by the SSTs are very important indicator of customer acceptance of SSTs. The sufficiency, relevance, timeliness, accuracy, clarity, consistency and simplicity of information/instructions were recognised as the embedded qualities of rich information. Froehle & Roth (2004) recognised 'information richness' as important in determining customer beliefs on technology mediated services. The qualitative phase of this study evidenced that young people are capable to grab the richness of information/ instruction and use it effectively in their co-creation activities.

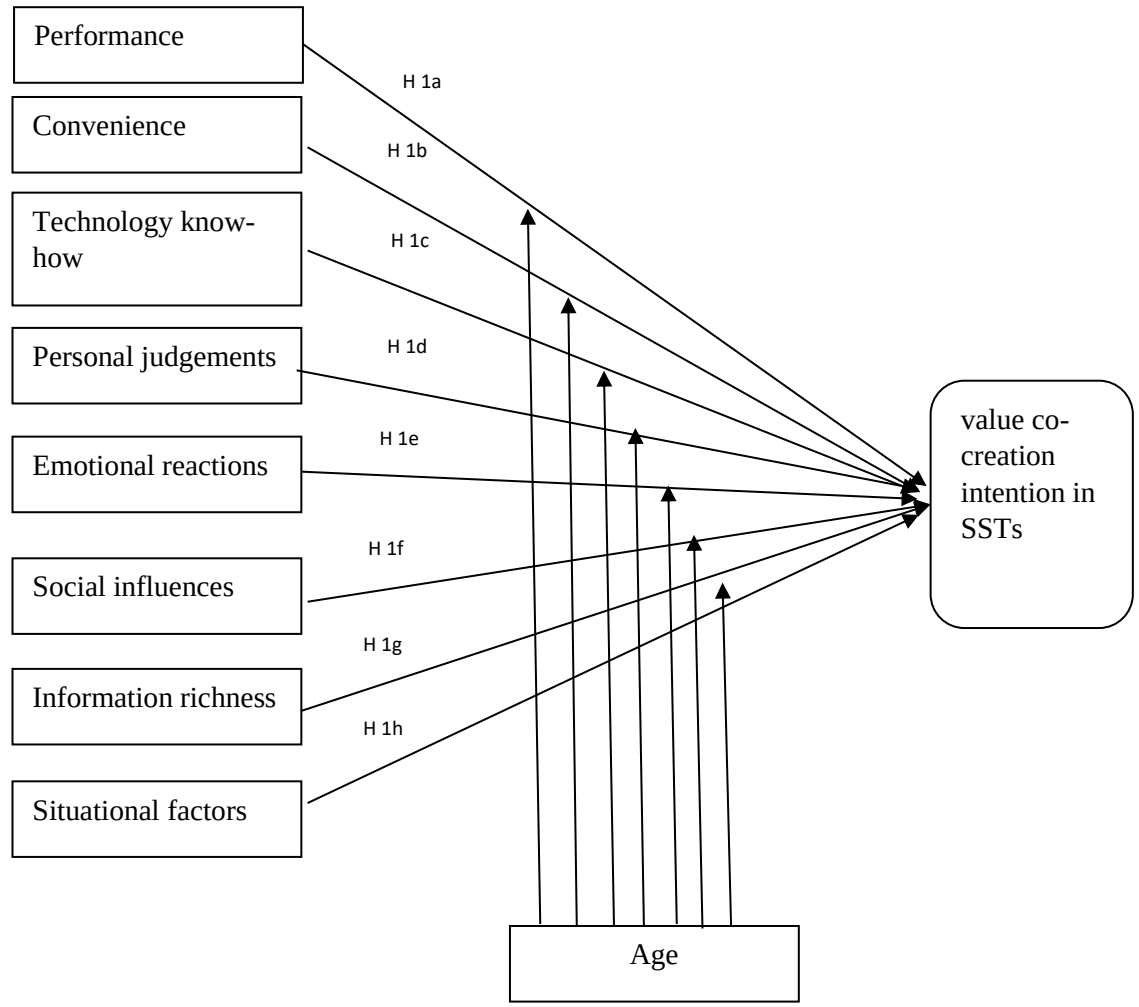
> **H1g:** The effect of 'information richness' on customer value co-creation intention in SSTs is moderated by age such that the effect is stronger for younger individuals.

Situational Factors: This study recognises a higher tendency to use SSTs when physical service encounters are crowded, the customer is in a hurry and the task is simple to perform. Further, it was found that use of self-service technologies especially, online and telephone SSTs is higher when people are alone (not in a group). Wang et al. (2012); Demoulin & Djelassi (2016) identify the importance of situational factors in SST adoption. The following hypothesis is developed to examine the effect of situational factors on customer value co-creation intention in SSTs.

> **H1h:** Situational factors have a significant influence on customer value co-creation intention in self-service technologies.

The following figure (figure 3.5) conceptualises the hypothesised effects on customer value co-creation intention in SSTs.

Figure 3. 5: Factors affecting customer value co-creation intention



3.5.1.4 Conceptualizing customer value co-creation practices in self-service technologies

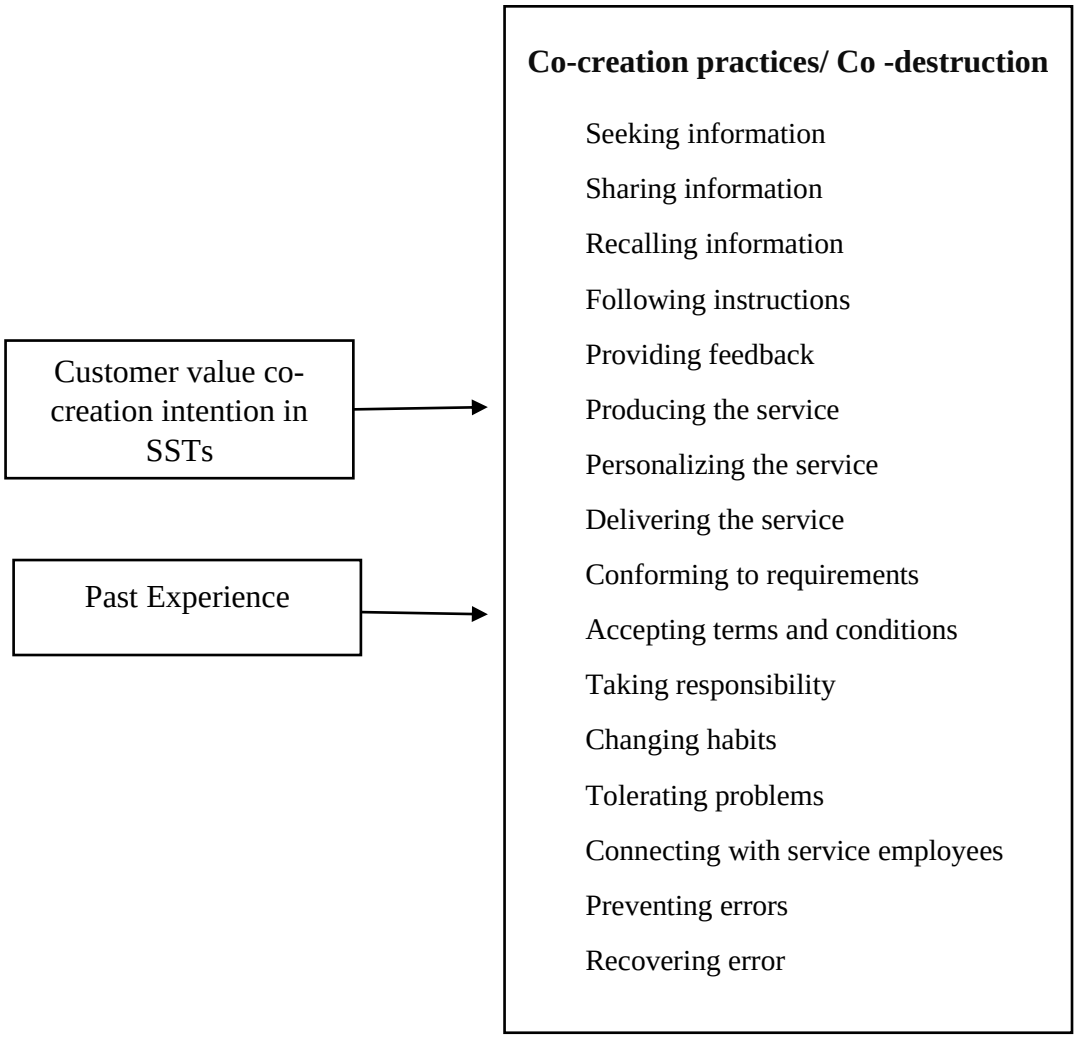
The qualitative study (study one) identified sixteen customer value co-creation practices in self-service technologies, namely, seeking information, sharing information, recalling information, following instructions, providing feedback, producing the service, personalizing the service, delivering the service, conforming to requirements, accepting terms and conditions, taking responsibility, changing habits, tolerating problems, connecting with the service provider, preventing errors and recovering errors (see section-3 of Chapter Three; qualitative research findings).

Although in the qualitative study, these sixteen practices were categorised into five main groups (5Cs) as co-learning, co-operation, co-production, connection and correction, in the quantitative study it was decided to consider all these practices under a single theme as 'value co-creation practices' for two main reasons. 1) recognising each five co-creation and co- destruction factors would increase the overall model complexity, when testing the full model recognising the sequential effects of customer value co-creation intention, practices and experiences in SSTs. 2) This five-factor model shows discriminant validity issues (discussed in the next chapter). However, as noted in the qualitative study findings and as the available literature suggests, these practices are interconnected (Stieler et al., 2014:72) such that success or failure in performing one practice connects with others and finally results in overall co-creation or co-destruction. Therefore, even though these practices are qualitatively categorised into different conceptual domains, the interconnectivity is acceptable.

Further, the qualitative study revealed that performing such practices may not result in equal success to every customer, every time. Some customers were found as not to have adequate abilities in performing these practices or to be unwilling to perform them, for several reasons. Situations where the customer cannot perform value co-creation practices successfully result in failures, which finally reduce the well-being of the customer which is known as value 'co-destructions' in this study. Consistent with Echeverri & Skalen (2011), this study also finds value co-creation and co-destruction as duality of same practices. However, this study does not use the word 'value co-destruction practices', since the qualitative study witnessed that these types of value co-destruction take place mainly due to inabilities or unexpected problems rather than purposefully practicing co-destruction.

Having identified these value co-creation practices and co-destructions in SSTs, the quantitative study aims to identify the effect of customer co-creation intention on practices. Similarly, the literature shows the effect of 'behavioural intention' on 'use-behaviour' in technologies (Venkatesh et al., 2003). As found in the practice theory, customer past experience is prominent in performing these routinised practices. Further, Zhang et al. (2017) identify positive relations between past experience and customer engagement. Therefore, it is proposed to test the effect of 'past experience' on customer co-creation practices and co-destructions.

Figure 3. 6: Effect of customer value co-creation intention on co-creation/co-destruction



Customer co-creation intention: The qualitative study found that customer co-creation intention in self-service technologies is important in determining their co-creation practices and co-destructions. As Venkatesh et al. (2003) note, 'behavioral intention' has a strong direct effect on 'use-behaviour' of technologies. Based on this, the hypothesis is developed as,

> **H2a**: Customer value co-creation intention has a significant positive effect on value co-creation practices and a significant negative effect on value co-destruction in SSTs.

Past-experience: This research found past-experience to be one of the most important factors which influence customer value co-creation practices in self-service technologies. As Warde (2005) suggest, 'past experience' is crucial as it make people more familiar in performing routinised practices. Therefore, following hypothesis is developed to test how past experience affects on both customer value co-creation and co-destruction in SSTs.

> **H2b**: Past-experience has a significant positive effect on customer value co-creation practices and a significant negative effect on value co-destruction in SSTs.

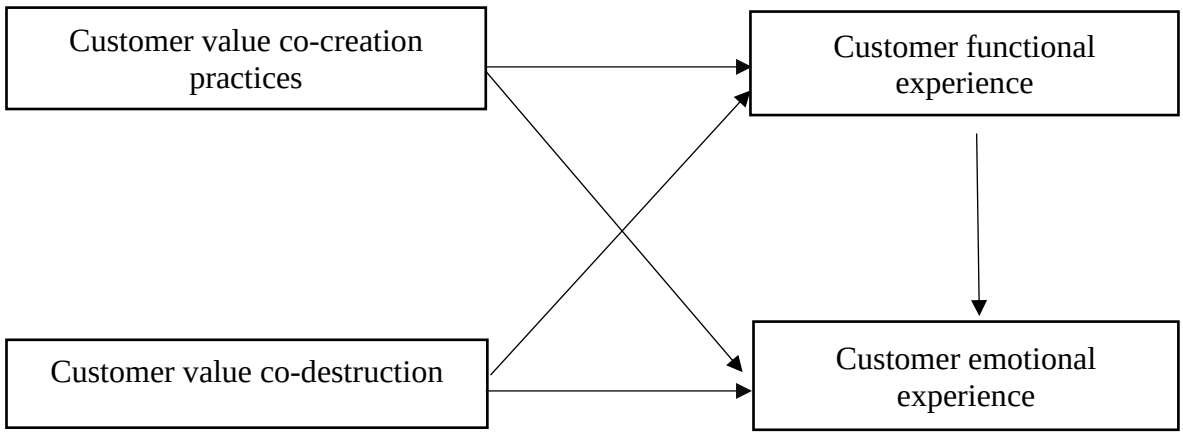
3.5.1.5 Conceptualizing customer experience

Following the literature (Berry et al., 2002b; Oswald et al., 2006; Sandström et al., 2008), the 'total customer experience' concept has been chosen to understand the customer value co-creation experience in self-service technologies. Accordingly, both functional and emotional elements of experiences are examined.

The study is intended to test the effects of customer value co-creation practices and value co-destruction on customer functional and emotional experiences. Providing backdrops, Füller & Matzler (2007) also note that customer value co-creation experience in self-service technologies is an outcome of his/her interaction with SSTs.

Additionally, the study examines the influence of customer functional experience on their emotional experiences. Similarly, the relationship between functional and emotional experience is found in the literature (Berry et al., 2002a; Oswald et al., 2006). The following conceptual framework illustrates the effect of customer value co-creation / co-destruction on customer functional and emotional experiences.

Figure 3. 7: The effect of customer value co-creation/ co-destruction on experience



Accordingly, following hypotheses are proposed.

H3a: Customer value co-creation practices in SSTs have a significant positive effect on customer functional experiences.

H3 b: Customer value co-creation practices at SSTs have significant positive effect on customer emotional experiences.

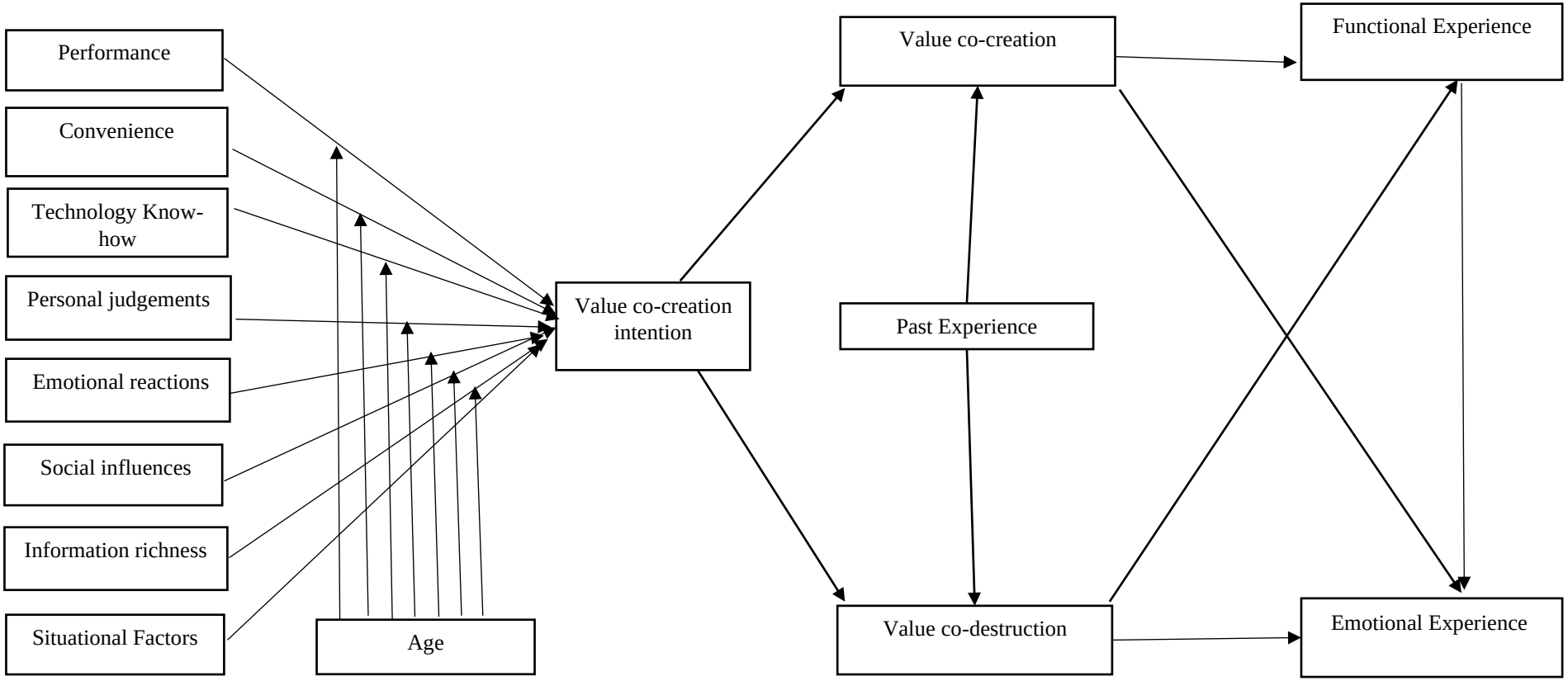
H3 c: Customer value co-destructions have a significant negative effect on customer functional experiences.

H3 d: Customer value co-destructions have a significant negative effect on customer emotional experiences.

H3 e: Customer functional experience has a significant positive effect on customer emotional experience.

The full conceptual framework, which explains customer value co-creation intention, practices and experiences in self-service technologies in a single platform, is shown in the following figure (3.8).

Figure 3. 8: Conceptual Framework



CHAPTER THREE - SECTION FIVE - PART TWO

OPERATIONAL DEFINITIONS AND ITEM GENERATION

3.5.2.1 Introduction

This section focuses on developing operational definitions for the constructs and generating items to measure them. The findings of the qualitative study compared with the available literature are used in achieving this purpose.

3.5.2.2 Operational definitions and item generation

Operational definitions are very important in measuring abstract concepts especially those are subjective (Sekaran & Bougie, 2016). Objective variables can be easily measured through straightforward questions (e.g. age) and therefore need not to be operationally defined. The concepts which have already been operationally defined in the literature, were carefully used /adapted to the current study. Apart from that, operationalising new constructs were carefully done by looking at the properties represented by the construct (Sekaran & Bougie, 2016).

After defining the constructs in this study, they were transformed into measurable elements (items). The generation of items went through considerable pilot work to refine wording and content. Further, items were evaluated by comparing with the associated literature and reviewed by experts in the field to assure the face or content validity (Rattray & Jones, 2007).

3.5.2.3 Operationalisation of the customer value co-creation intention in self-service technologies

The qualitative study found 45 items, later classified into eight groups as determinants of customer value co-creation intention in SSTs. The following table (Table 3.8) explains the operational definition, items and the statements used in the questionnaire to measure the customer value co-creation intention in self-service technologies. More details about the constructs and items have been given in the previous subsections of ‘qualitative study findings’ and ‘conceptual framework’.

Table 3. 8: Operational definitions and item generation to understand customer value co-creation intention in SSTs

Construct	Operational Definition	Items	Statements in the questionnaire
Performance	The degree to which using SSTs provide benefits to consumers in performing certain activities' (adapted from Venkatesh et al. (2012:159))	Usefulness	I find SSTs are useful in my daily life
		Speed	SSTs are quick in performing tasks
		Efficiency	Using SSTs increases efficiency
		Consistency	SSTs provide a consistent service
		Cost-effectiveness	Working with SSTs is economical
		User-friendliness	SSTs are user-friendly
		Trialability	I can use SSTs on a trial basis to see what I can do
		Reliability	SST transactions are reliable
Convenience	The degree of ease associated with the use of SSTs (adapted from Venkatesh et al. (2012:159))	Time convenience	I can use my own convenient time when I work with SSTs
		Less physical effort	Less physical effort is required in performing SST transactions
		locational convenience	SSTs allow me to work in a place convenient to me
Technology Know-how	General technical knowledge required to perform in SSTs and ease related to gathering and using that knowledge.	Knowledge of SSTs	I have the necessary knowledge of technologies to use SSTs
		Computer Knowledge	I have the necessary computer knowledge
		Knowledge on internet	I have the necessary knowledge of the internet
		Ease of learn	Learning to operate SSTs is easy for me
		Ease of use	I find SSTs are easy to use
Emotional reactions towards SSTs	Individuals' emotional responses towards self-service technologies	Love	I love SST transactions
		Enjoyment	I enjoy interacting with SSTs
		Fear	I am afraid of carrying out SST transactions
		Guilt	I feel guilty about using SSTs
		Isolation	Using SSTs makes me feel isolated

Personal judgements	Individuals' subjective evaluations of the elements of SSTs and their own personalities	Trust	I trust self-service technologies
		Risk	I feel performing SST transactions is a risk
		Privacy	My personal information is treated confidentially in SSTs
		Independence	Using SSTs gives me a sense of independence
		Self-control	I have self-control when working with SSTs
		External control	Some of the SST related factors are beyond my control
		Self-efficacy	I am confident of my ability to work with SSTs
		Voluntariness	I believe that SSTs are voluntary
		Resource availability	In my judgement, resources available for SST transactions are adequate
Social Influence	The extent to which individuals perceive the importance of influences of other people and the society. (adapted from Venkatesh et al. (2012:159)	Personal sources	People who are important to me think that I should use SSTs
		Organizational sources	Service employees support the use of SSTs
		Society	Using SSTs is considered as a social norm
Information richness	The degree of richness and quality of the given information/instructions in SSTs		Evaluate the following characteristics of information/instructions given by SSTs,
		Sufficiency	Sufficiency
		Relevance	Relevance
		Timeliness	Timeliness
		Accuracy	Accuracy
		Clarity	Clarity
		Consistency	Consistency
		Simplicity	Simplicity

Situational factors	External factors, outside the control of customers	Crowding	Crowding at physical interfaces influences me to use SSTs
		Urgency	If I am in a hurry, I usually use SSTs
		Group or alone	I usually use SSTs when I am alone (not in a group)
		Task complexity	If perceived task complexity is high, I will not use SSTs
Age	Age of the respondents	Age category	Age categories
Past experience	Previous use, handling and the familiarity with the SSTs	Past experience	How do you rate your level of experience with SSTs, (7-point Likert scale from Mostly inexperienced to Mostly experienced)?
Value co-creation intention	An indication of an individual's readiness to co-create value in self-service technologies	Intention	I intend to use SSTs in future
		Prediction	I predict I will use SSTs in future
		Plan	I plan to continue my SST transactions in future

3.5.2.4 Operationalisation of the customer value co-creation practices in self-service technologies

The qualitative study identified sixteen value practices in self-service technologies that determines both co-creation and co-destruction. The Table 3.9 shows construct definitions, items used in measuring the construct, and statements used in the questionnaire to measure both value co-creation and co-destruction. Additional details about these constructs and items were provided in the previous subsections of qualitative research findings and development of the conceptual framework.

Table 3. 9: Operational definitions and item generation to understand customer value co-creation practices and co-destruction in SSTs

Construct definition	Variables	Description	Statements in Co-Creation	Statements in Co- Destruction
Customer value co-creation practices in SSTs ‘Customer collaborative participation in integration of resources through activities and interactions mainly with self-service technologies and when needed with relevant service providers or other collaborators in the customer’s service network to realizing the benefits’	Seeking information	Searching required information for SST value co-creation from different sources	I am capable of gathering the required information for my SST transactions	I am not good at searching all relevant information on exactly what I want in SSTs
	Sharing information	Sharing SST-related information with other parties	I share information/experiences about SSTs, so then others can follow them for better decisions	Normally I do not share information/experiences with others unless it badly hurts me.
	Recalling information	Recalling frequently needed information to perform with SST.	I am good at recalling frequently needed information for SST transactions such as passwords, PIN numbers etc	I usually forget frequently needed information such as passwords, PIN numbers etc.
	Following instructions	Following the instructions given by the service provider to perform SST services	I am good at following instructions given by SSTs	Some of the SST instructions made me confused
	Providing feedback	Providing feedback to the service providers on SST performance.	I often provide feedback to the company, whenever I am asked to do so	I usually do not provide feedback

(adopted from McColl-Kennedy et al. (2012:6) ***Customer Value co-destruction*** *"an interactional process between the customer and the self-service technologies, and when needed with relevant service providers or other collaborators in the customer's service network that results in a decline in mainly the customer's well-being.'* *Adopted from Ple & Cáceres (2010:431)*	Producing the service	Producing the core service in SSTs.	I can perform my own SST transactions	Sometimes I find difficulties in performing SST transactions
	Personalizing the service	Personalizing the co-service based on individual preferences.	I can personalize my own service in SSTs from the available options	Personalizing services in SSTs is a complicated task for me
	Delivering the service	Delivering the service in SSTs	I can decide on the delivery options in SSTs based on my requirements	Delivery options given by the SSTs are not helpful to me
	Conforming to requirements	Fulfilling the basic requirements to perform with SSTs	I can fulfil the basic requirements to perform SST transactions (e.g., identity proofs, own emails/bank accounts/age requirements etc.)	I find it difficult to complete SST transactions due to not meeting basic requirements
	Accepting terms and conditions	Accepting terms and conditions given by the service provider	I usually accept terms and conditions in SST transactions	I am not always willing to accept terms and conditions in SST transactions
	Taking responsibility	Taking responsibility for their self-service behaviour	I am willing to take responsibility for my own SST transactions	I do not like to take responsibility for the unseen SST transactions
	Changing habits	Changing habits to move from interpersonal interaction to interactive practices in SSTs	I am willing to adapt myself to the developments/changes in SSTs	While SSTs continually change, I am not keen to accept change
	Tolerating failures	Tolerating failures in SSTs	I am good at tolerating SST failures	I can't tolerate delays, failures or technological errors in SST transactions

	Connecting with the service providers	Connecting with service employees when necessary	Although I deal with SSTs, I can still connect with the company employees when necessary	I have experienced many difficulties of connecting with the supportive staff in SST providers
			I can get the help of customer service employees when I am faced with SST transaction difficulties	Automated responses given by many SSTs irritate me when I really need human support
	Preventing errors	Preventing errors before they occur	I am aware of warning messages and respond to them in order to prevent errors in SST transactions	I usually experienced problems as I often do not pay adequate attention to warning messages of SSTs
	Recovering errors	Recovering the error after it occur	If something goes wrong with SST transactions, I can still correct it through different processes	I have experienced difficulties in correcting errors in SST transactions

3.5.2.5 Operationalisation of the customer value co-creation experience in SSTs

Customer experience is operationalised from the 'total customer experience perspective' (TCE) including both functional and emotional elements of the customer experience (Sandström et al., 2008). Berry et al. (2002b) identify the total customer experience as the experiences attached to both functional and emotional nature of the product/service. Oswald et al. (2006:399) define TCE as "a right blend of both physical and emotional elements along all the stages of the customer experience and value chain, that is, all moments of customer contact with the producer". The need to study the 'total customer experience' is identified as essential, especially in services marketing (Oswald et al., 2006; Verhoef et al., 2009). The following table explains the operational definitions of customer value co-creation experience in SSTs.

Table 3. 10: Operational definitions and item generation to understand customer value co-creation experience in SSTs

Concept and definition	Variables	Items
Total customer experience Right blend of both functional and emotional elements of customer experience (Oswald et al. (2006:399)	**Functional experience** Customer experience related to the utilitarian benefits of the service.	Through SSTs I accomplished just what I wanted to do (Babin et al., 1994)
		SSTs helped me to save my time (Sandström et al., 2008)
		SSTs is a good solution to my busy life
		Working with SSTs is cost-efficient (Sandström et al., 2008; Lee et al., 2011)
	Emotional Experiences Customer experience related to the hedonic benefits of the service.	I enjoy SST transactions (Babin et al., 1994; Verleye, 2015)
		I feel relaxed with SST transactions
		SST transactions make me excited (Babin et al., 1994; Richins, 1997)
		I feel a sense of adventure when working with SSTs (Hsieh,2015)
		SSTs are boring
		I am afraid to work with SST (Richins, 1997)
		Working with SSTs is lonely (Richins, 1997)

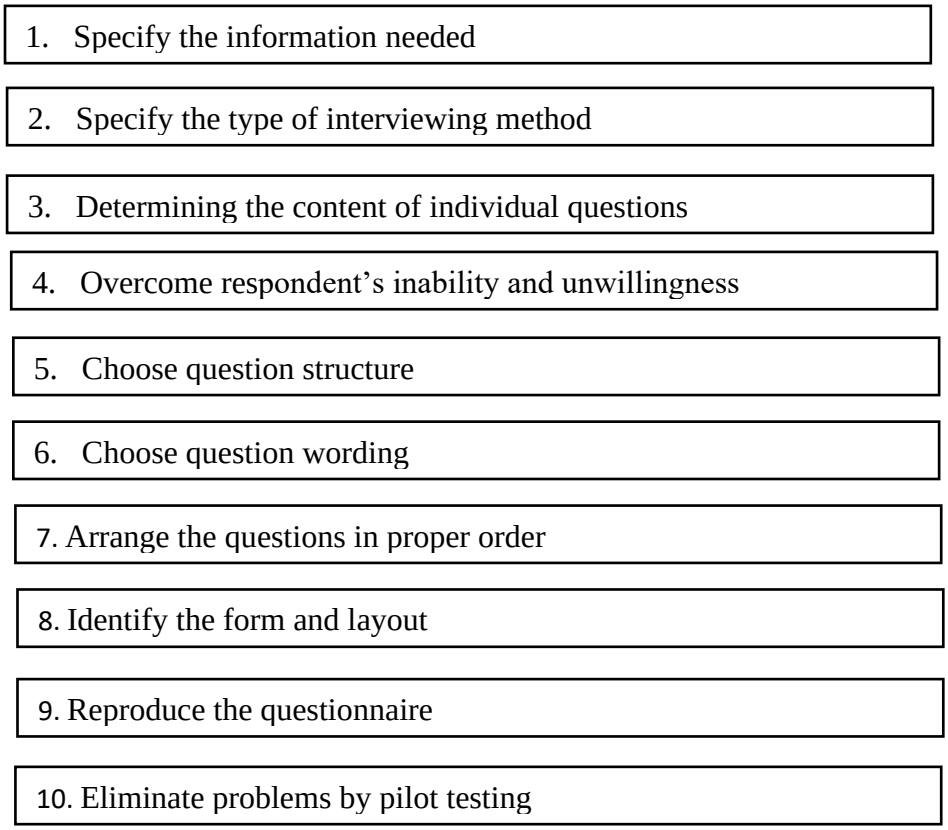
CHAPTER THREE - SECTION FIVE - PART THREE

QUESTIONAIRE DEVELOPMENT

3.5.3.1 Questionnaire development process

The questionnaire is defined as "a pre-formulated written set of questions to which respondents record their answers usually within rather closely defined alternatives" and works as an efficient data collection mechanism, especially when the researcher fully understands the exact information needed and the way of measuring variables (Sekaran & Bougie, 2016:142). Good questionnaire designing should focus on three main areas: principles of wording, principles of measurement and general getup (Sekaran & Bougie, 2016). This study went through the process proposed by Malhotra & Birks (2007) for developing the questionnaire. The following figure illustrates the questionnaire development process, which is followed by this study.

Figure 3. 9: Questionnaire development process



Source: Malhotra & Birks (2007:375)

3.5.3.1.1 Specify the information needed

After determining the research questions and objectives, it is necessary to see which kind of information to be gathered to address the research problem at hand. The findings of the qualitative study and a comprehensive review of the literature provided the foundations to understand the nature of the data to be collected in the quantitative survey. To ensure that all components of the problem are fully addressed, dummy tables were prepared. A screening question was recognised as needed at the beginning of the questionnaire, to understand the respondent's frequency of using the given types of self-service technologies.

The information requirement was based on achieving three main research objectives. First, to understand customer value co-creation intention in self-service technologies with the influencing factors; second, to understand customer value co-creation practices and co-destruction in self-service technologies and finally, to recognise their value co-creation experiences including both functional and emotional aspects. Apart from those, some socio-demographic information such as age, gender was required as classification questions and to measure moderating effects.

3.5.3.1.2 Specify the type of interviewing method

Determining the type of the survey and the questionnaire administration procedure is a prerequisite for developing a quality data collection tool (Sekaran & Bougie, 2016). This study used the field survey method with self-administered questionnaires as the quantitative data collection approach. A self- administered questionnaire is designed in a way that respondents should complete it without the intervention of the researcher (Lavrakas, 2008). Therefore, as suggested by Wolf (2008), special attention was given to avoiding measurement errors and to the format of the questionnaire.

3.5.3.1.3 Determining the content of individual questions

The questionnaire is presented in five main sections. 'Section A' focused on understanding how people use self-service technologies. Respondents were asked to circle the options which best explained their frequency of usage of the given SST options. At the end of the table, an additional space was given for 'other options', to allow

respondents state any alternatives which were not provided. Questions in 'section B' focused on understanding customer intention of accepting self-service technologies in general. Influencing factors which were recognised in the qualitative part of the study, refined through the literature review, were given as statements for respondents to indicate their level of agreement. 'Section C' was based on questions for measuring the customers' value co-creation practices and the possibilities of value co-destruction in performing such practices. Section D was dedicated to measuring the customer value co-creation experience in SSTs. Questions on customer sociodemographic information were included to the end of the questionnaire.

Expert reviews were used to determine the goodness of the content of the questionnaire, especially to make sure whether the content of the questions was necessary, whether several questions were needed instead of one, whether there were any double-barrelled questions etc. Based on the opinions of the experts, some questions were dropped, reworded, or combined (see sub section 3.5.3.1.10: Expert reviews in the methodology chapter).

3.5.3.1.4 Overcome inability and unwillingness to answer

To reduce the inability to answer, respondents were selected based on the criteria of being above eighteen years old and having had experienced self-service technologies. The first section of the questionnaire (list of common SST options to indicate respondent's frequency of usage) was implicitly intended to make the respondent familiar with the various types of SSTs available and further enhance their ability to respond to the next parts of the questionnaire. The questions on 'intention' were placed immediately after the first (filter) question, and middle sections of the questionnaire were organised sequentially, based on co-creation practices and experience.

Sensitive questions and questions that needed recalling were not included in the questionnaire. Further, a strategy of providing response categories rather than asking for specific information (closed-ended) was also used. Simple language, simple statements and clear instructions, were used to reduce unwillingness to respond.

3.5.3.1.5 Choose question structure

The questionnaire was 'structured' (closed-ended), and a few options were provided for respondents to indicate any other options if the given response categories did not correctly represent their true response. Hair et al. (2013) note that researchers must have a good understanding of suitable measurements scales for variables in structuring the questionnaire, since this choice is critical in selecting the most appropriate data analysis techniques. In this study, the main sections of the questionnaire were based on scales which show the degree of a particular attribute (Hair et al., 2013). The seven-point Likert scale was used, since it provides a more accurate measure of participants' true evaluation and especially more suitable for unsupervised usability questionnaires such as self-administered questionnaires (Finstad, 2010). However, the screening question in section A of the questionnaire; customer usage of different types of self-service technologies, was measured with a five-point Likert scale. The demographic questions were 'non- metric', representing discrete characteristics and based on nominal and ordinal scales.

3.5.3.1.6 Choose question wording

Sekaran & Bougie (2016:146) advise researchers to consider: 1. the appropriateness of the question content, 2. the wording and the level of sophistication of the language, 3. the type and form of the question, 4. the sequencing of the question, 5. personal data obtained from the respondent etc. in wording the questions.

The questionnaire was in English which is the national language of the United Kingdom and used simple terms (ordinary words) to aid understanding for ordinary people. The questionnaire comprised both positively and negatively worded questions. Negatively worded questions were used purposely to minimise the tendency to mechanically circle the responses in one end of the questionnaire and mixed with the positively worded questions to reduce bias in responding (Sekaran & Bougie, 2016).

The maximum effort was taken to avoid double-barrelled questions, social desirability questions and ambiguous questions (Sekaran & Bougie, 2016). Further, leading questions, sensitive questions and recall dependent questions also were not included in the questionnaire.

3.5.3.1.7 Arrange the questions order

The sequence of the questions helps respondents to move from general types of questions to more specific. The opening question is very important in gaining the confidence of the respondents (Malhotra & Birks, 2007). The opening question of this questionnaire was to make respondents familiar with the self-service technologies and understand their frequency of usage. A list of SST options was provided in the opening question, asking respondents to circle their frequency of usage of each of the relevant self-service technologies.

Following a logical order, the respondents' intention of using SSTs in general, was questioned in the next stage. Then, the respondents were asked to consider their frequently used specific self-service technologies when answering the rest of the questionnaire (co-creation practices and experiences). Classification questions (demographic details) were placed to the end of the questionnaire. The logical order of the questionnaire was also tested in the expert review and the pilot study.

3.5.3.1.8 Identify the form and layout

Format, spacing and the positioning of the questions have a significant influence on results, especially in self-administered questionnaires (Malhotra & Birks, 2007). In this study, the questionnaire was divided into five sections based on the nature of the questions and the logical order. Guidelines and information were provided at the beginning of every section in bold letters on a coloured background. The questions were pre-coded and numbered properly.

Section A: 'Section A' of the questionnaire focused on understanding customer usage of self-service technologies. The selected self-service technology options were provided, and the respondents were asked to indicate their frequency of usage.

Section B: The second section of the questionnaire concerned measuring the customer intention of accepting self-service technologies with antecedents.

Section C: This section was on customer value co-creation practices and co-destructions in self-service technologies.

Section D: Section D of the questionnaire was focused on understanding customer value co-creation experience, including both functional and emotional elements.

Section E: Section E was on the respondent's socio demographics details.

3.5.3.1.9 Reproduce the questionnaire

The questionnaire was finally checked for the use of appropriate introduction, instructions, well-arrayed questions and types of response categories etc. Instructions for different sections were provided with centred, bold black letters on an ash colour background, in a rectangular frame. All the statements were left aligned and numbered. Statements were separated one from the next by an ash colour shaded line. This would help the respondent to distinguish statements and provide responses on the allocated line without mistakenly moving into other spaces. The measurement scale was presented at the opening of each section and at the beginning of every new page, to remind respondents of the structure of the scale.

The questionnaire was printed on good-quality, white A3 papers in booklet format to ensure a professional appearance. Since the questionnaire was somewhat lengthy and ran into several pages, the booklet format provided ease of handling (Malhotra & Birks, 2007).

3.5.3.1.10 Eliminate problems by pilot testing

Expert reviews and a pilot study were conducted with the purpose of understanding problems in the questionnaire and eliminating them before moving to the final stage of data collection. The content of the questions, wording, difficulties in understanding questions, sequence, form and layout, clarity of instructions etc were tested in these stages.

1.5.3.1.10.1Expert reviews

Expert review is a vital process in item evaluation and questionnaire development and helps to establish the face and content validity of the measurement. Content validity concerns whether test items are representative of the domains they are supposed to measure (Kline, 2012) while face validity explains the degree to which experts judge that the items of an assessment instrument are suitable to the targeted construct and assessment objectives (Hardesty & Bearden, 2004).

The questionnaires, with operational definitions and codes, were sent to 12 experts in academic and service sectors to obtain their expertise. Their evaluations and opinions were used to improve the questionnaire for the pilot study. The following table summarises the expert opinions and adjustments/modifications made to the questionnaire based on their views.

Table 3. 11: Summary of the expert reviews and the steps taken to develop the questionnaire

Expert opinions	**Amendments**
Overall questionnaire	
Provide the approximate time taken to fill the questionnaire in the introduction.	Included the approximate time duration taken to fill the questionnaire in the introduction section.
Ask respondent to circle the responses, instead of ticking (√), with the purpose of increasing engagement.	Changed instructions to 'circle the response'.
Change the way of addressing the respondent as 'Dear Sir/ Madam' instead of 'Dear respondent.'	Changed the address into 'Dear Sir/Madam.'
Change the order of the sections and provide clear instructions on which section onwards should the respondents limit their responses to 'frequently used SSTs'.	Moved the section on 'customer intentions of accepting SSTs' to the beginning of the questionnaire since it requires the respondent's general view. The instruction was given to refer only to frequently used self-service technologies when responding to the latter part of the questionnaire.
Change the scale used to measure customer's 'past experience of SSTs (previous use)' since it can be confused with general customer experiences (evaluations). Convert the scale used to measure past experience into seven-point Likert scale.	Changed the scale from " very poor, poor, neutral, good, very good" to " mostly inexperienced, inexperienced, somewhat experienced, neutral, somewhat experienced, experienced and most experienced" with seven-point Likert scale.

Reduce the length of the questionnaire	Tried to address by adopting several alternative approaches without reducing the number of the questions.
Section A	
Provide the self-service technology options in a single list without categorisations.	Removed the coding of categorisation
Provide an option for 'other' for section A, so that the respondent can write any additional SST options.	Provided 'other' option to 'section A'.
Section B	
Remove codes to reduce common method bias	Removed codes from the final questionnaire
Mix up reverse order questions among other statements	Changed the order of statements to address this opinion
Section C	
Change the order of some statements	Done
Section E	
Mix up reverse order questions	Done
Demographic Questions	
Add another category for education as 'other qualification.'	Added the option, 'other qualifications.'
Add another classification question on how long respondents have been staying in the United Kingdom.	Added.

1.5.3.1.10.2 Pilot study

The pilot study was conducted with 45 respondents (SST users) around the Hull area in the United Kingdom. The representation of different demographics (mainly age, gender and education) was ensured to obtain a clear picture of the understanding of the questionnaire.

The questionnaires were provided to the respondents to complete by themselves (self-administered) in the presence of the researcher, with the purpose of understanding problems encountered by them. The respondents were requested to carefully read and complete the survey form and note all the issues they come across. A debriefing was given at the end of the completion of the questionnaire, declaring the true intention of conducting the pilot survey. Then the participants were encouraged to talk about problems they faced while responding to the questionnaire. Necessary improvements were made addressing the problems encountered in the pilot study. The following table illustrates the findings of the pilot study, with the improvements made to the questionnaire.

Table 3. 12: Summary of the pilot study and the steps taken to improve the questionnaire

Respondent's Feedback	**Adjustments to the questionnaire**
Change the word 'kiosk' to 'machines' in option 14 in section A	Changed the word
Provide a few examples to options 9,16 and 18	Provided prominent examples
Change the word 'cheap' in statement number 05	Changed into 'economical.'
Provide example for statement 21, since it was not clear to the respondent	Reworded the statement ensuring more clarity and provided examples
Develop an online version of the questionnaire, so the respondent can easily access in their free time.	Could not address it, since the researcher wanted to ensure the uniformity of the data.
Shorten the questionnaire	Tried to address as much as possible without any harm to the information needed.

3.5.3.2 Addressing common method bias

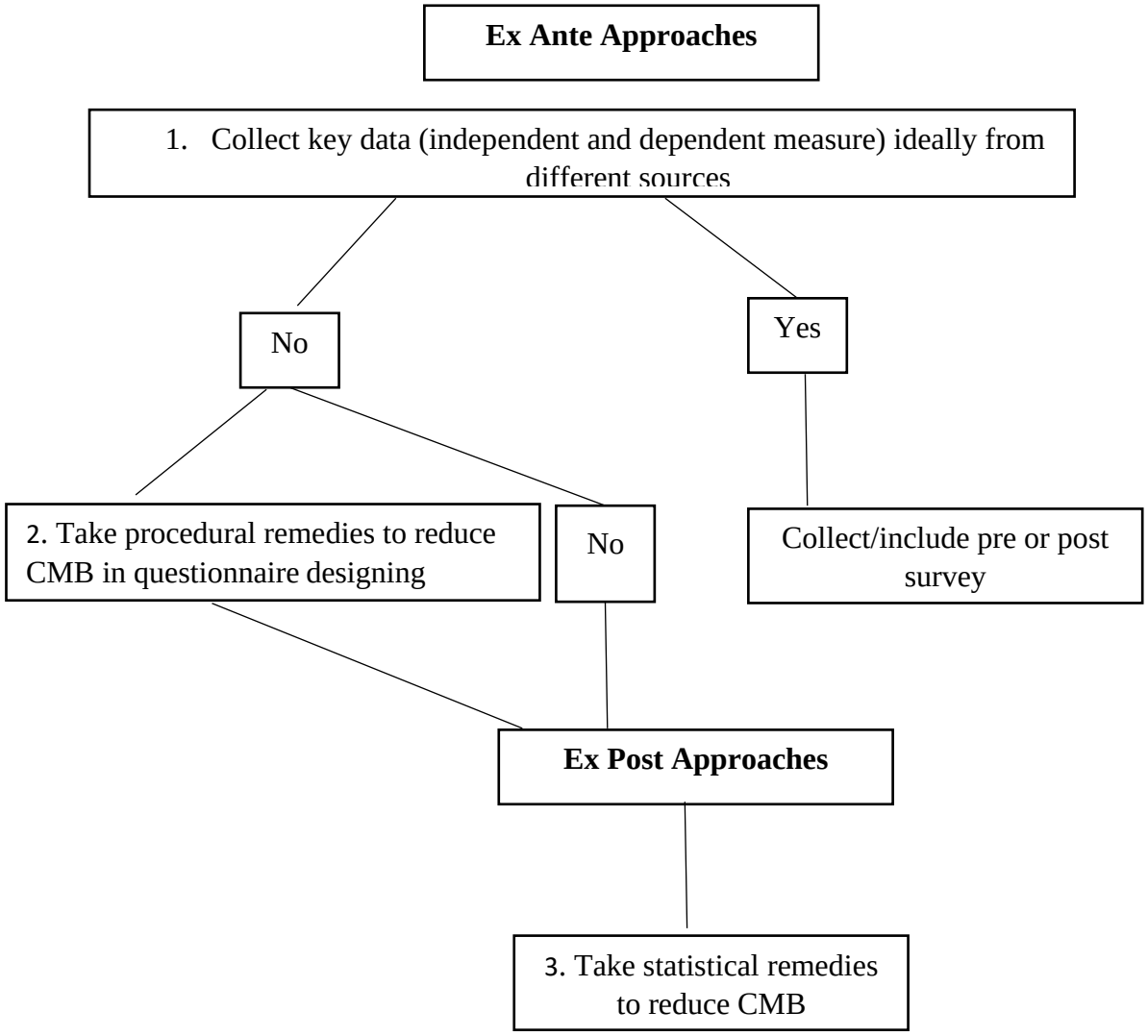
Common method bias (CMB) or common method variance has a long history in the scholarly work in behavioural sciences (Podsakoff et al., 2003). This occurs mainly in surveys (Craighead et al., 2011) when using self-report questionnaires as the data collection instrument (Chang et al., 2010; Conway & Lance, 2010) and especially when collecting data for both independent and dependent measures from the same respondent (Chang et al., 2010). In such situations, self-reported data might result in false correlations (Craighead et al., 2011) due to the fact that respondents have a propensity to answer consistently (Chang et al., 2010). Therefore, Common method bias/ variance is a potential threat for many of the behavioural studies including marketing (Viswanathan & Kayande, 2012) which can lead to measurement errors in results (Podsakoff et al., 2003).

MacKenzie & Podsakoff (2012) in their paper, "Common method bias in marketing, mechanics and procedural remedies" identify possible causes and effects of common method bias. Common method bias has two main bad effects; the first is, it can badly influence the construct validity and reliability (Conway & Lance, 2010; MacKenzie & Podsakoff, 2012) and create incorrect internal consistency (Chang et al., 2010). The reason for that is, the latent variable may contain systematic variance among its measures. The second effect is, it can bias "the parameter estimates of the relationship between two different constructs" (Podsakoff et al., 2012:542). This results in biased hypothesis testing and further causes type 1 or type 11 errors. Apart from those, it creates incorrect perceptions about the understanding on the percentage of variance explained by the construct and the discriminant validity of the scale. The improper use of response style, proximity and reverse items, the way of item wording, the item context and order of questions can cause this problem.

Two remedies for controlling common method bias are suggested by Podsakoff et al. (2012): 'procedural remedies' and 'statistical remedies'. The same are presented by Chang et al. (2010) as avoiding CMB in the research designing stage (ex-ante approaches) and dealing with the issue in the post statistical analysis stage (ex-post approaches). Procedural remedies are taken in the research designing stage and focus on obtaining measures of predictors and criterion variables from different sources, such as two different groups of respondents or obtaining one set of data from a secondary source etc. Further, separating predictors and criterion such as time gaps, the physical distance

between measures or cover stories are recognised as appropriate. Eliminating common scales, making the questionnaire short, improving scale items to eliminate ambiguity, reducing social desirability bias and balancing both positive and negative items were among other procedural remedies (Podsakoff et al., 2012). MacKenzie & Podsakoff (2012) point out that CMB is higher when respondents are unwilling or unable to provide accurate responses because in such cases, respondents try to be satisficing rather than providing the true response. They have further explained that CMB is higher when the researcher undermines the capabilities of the respondents and makes the task of responding accurately more difficult. The following figure (figure 3.10) illustrates approaches in handling common method bias.

Figure 3. 10: Approaches to handle Common Method Bias/Variance



Adapted from Chang et al. (2010:182)

This study could not collect data to measure independent and dependent variables separately from different sources, as Chang et al. (2010) suggest in ex-ante approaches, due to time and cost considerations. However, procedural remedies were taken in the questionnaire development stage to minimise common method bias. The following table explains the strategies implemented in this study, as procedural remedies to reduce common method bias.

Table 3. 13: Strategies to reduce common method bias

Potential sources of CMB	**Strategies Undertaken to reduce CMB in this study**
Researcher undermines the capabilities of the respondents (Lack of ability Lack of experience on the topic of questioning)	Designing the questionnaire in English, the national language of the United Kingdom. Before moving to the field survey, expert reviews and a pilot study were conducted, aiming to pre-test the questionnaire to ensure that it was written in a way the respondents could understand properly. The respondents were screened against age (above 18 years) and their experience (use) of self-service technologies to find who had experienced at least one of the self-service technology options.
When the task is more difficult to respond accurately (Complex or abstract questions, item ambiguity, double-barreled questions, questions that demand recalling)	Provided clear examples for some questions to increase understanding. The questionnaire was pretested further against language clarity, vocabulary and the appropriate use of syntax to improve the reading and comprehension capabilities of the respondents. Avoided vague, double-barreled, unfamiliar, and difficult to comprehend questions in the initial review process. All the questions were related to the current status of respondents and did not include any questions which needed effort in retrieving memory.

	The scale was provided at the beginning of every section and on every new page to remind respondents of the existing measurement.
Decrease the motivation of the respondent to respond accurately (Low personal relevance of the issue, low self-efficacy to provide right answer, less need for cognition, less need for self-expression, Repetitiveness of the items, Lengthy scales, Forced participation)	A 'cover story' with a brief introduction to the study and the purpose was provided at the very beginning of the questionnaire. The respondents were informed about why and how their responses were important in the study. Further, they were encouraged to provide true responses by informing them that there were no correct or wrong answers for the given statements. The responses were anonymous, and written assurance was provided to the respondents of the confidential use of their responses, only for the academic purpose. A statement was provided, indicating how the researcher valued their responses and an advance thanking note was included at the beginning. Clear instructions were provided at the beginning of every section. The measurement scale was given in bold letters at the beginning of each new page, aiding the respondents to evaluate carefully. An endorsement was provided by the principal supervisor, and contact details of both the student and the supervisor were provided to ensure credibility. The full questionnaire was divided into five sections and items on the questionnaire separated to minimise proximity effects. Three fake statements were included, asking the respondent to circle a given response (ex: could you please circle

	'strongly disagree' for this statement), to check whether they were filling the questionnaire mindfully. Reverse questions were used to minimise repetitions. Participation in the survey was voluntary.
Providing satisficing answers (Common scale attributes, Grouping similar items together)	It was explained to the respondent that 'though some questions seem similar, they are unique in survey purpose' and instructions were given encouraging them to read each statement carefully before responding. Dispersed similar items through the questionnaire without harming the flow of it.

Adapted by MacKenzie & Podsakoff (2012) and Podsakoff et al. (2012)

However, as Chang et al. (2010) noted, a perfect solution to Common Method Bias problem is out of reach. Even though the procedural remedies were taken to minimise common method bias, it might not be possible to eliminate it fully. Therefore, statistical remedies are also required in quantitative studies, which is discussed in detail in the data analysis chapter.

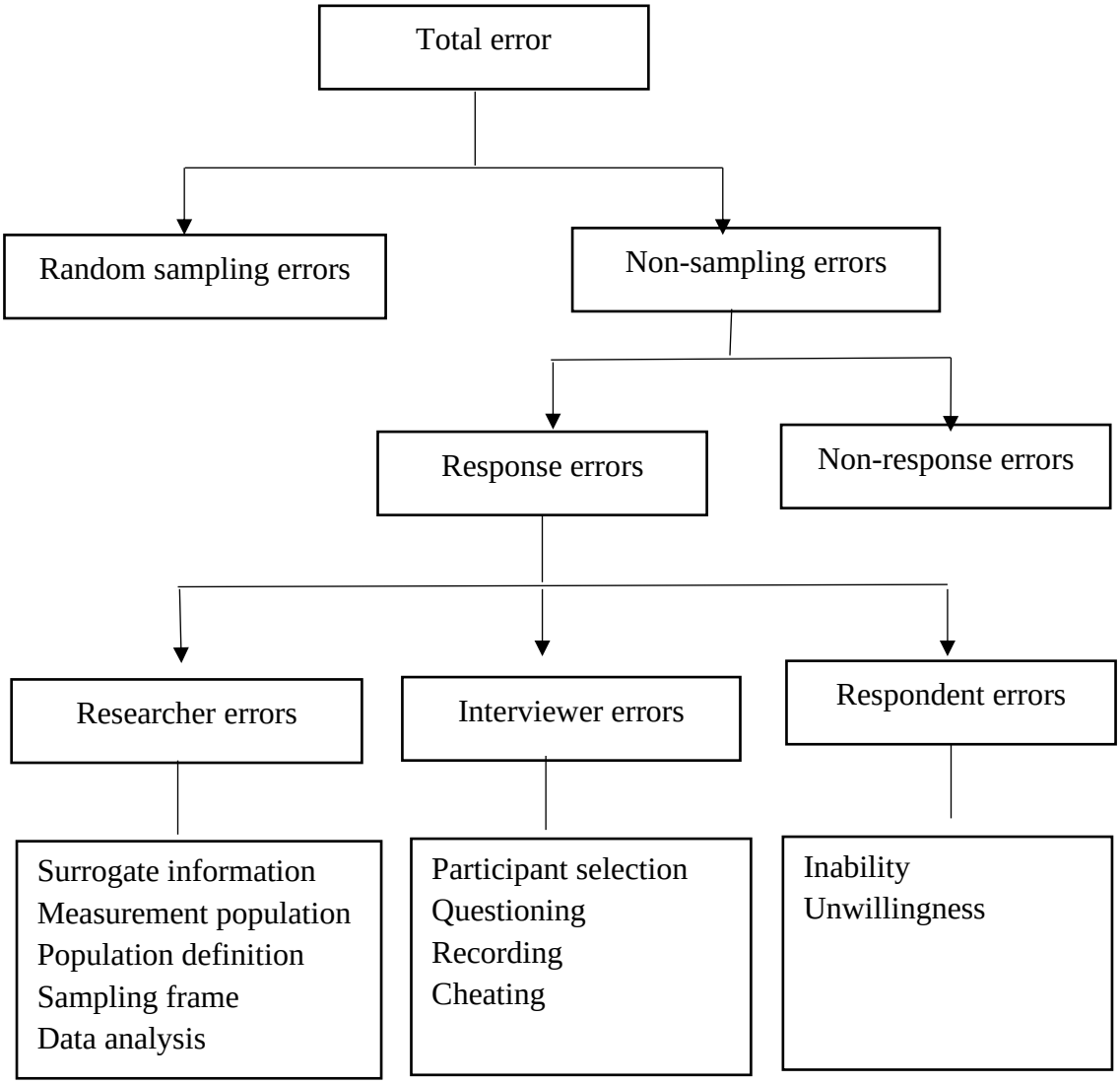
3.5.3.3 Response enhancement strategies in the survey

Achieving a good response rate is essential in designing a research, although non-responses cannot be eliminated in surveys (Saunders et al., 2009). However, the research designing process can be focused on obtaining suitable approaches to reduce the non-response rate. As pre-determined strategies in this research, first-class stamps were used for sending out the questionnaires, with self-addressed free-post return envelopes. The cover letter also emphasised the importance of the respondents' answers in making a difference between the success and failure of the study and also to the researcher's doctoral thesis. Further, a written assurance was provided to the respondents about the anonymity of their responses. No monetary incentives were offered to enhance the response rate.

3.5.3.4 Addressing the sources of errors /bias

Understanding the potential errors in a research and obtaining preventive actions to minimise them is essential in research (Malhotra & Birks, 2007). The following figure represents the sources of error.

Figure 3. 11: Sources of error



Source: Malhotra & Birks (2007:83)

Malhotra & Birks (2007) categorise total errors in research into two sets, as sampling errors and non-sampling errors. Sampling errors (random sampling errors) mainly occur because the chosen sample does not properly represent the target population. Adopting probability sampling techniques and selecting a large sample can be a solution to this type of error. Considering convenience and time, and consistent with some previous research

work in co-creation context, this study is based on a non-probability sampling technique. However, the study used a large sample in order reduce these sample errors. All other kinds of errors not attributed to sampling, are known as 'non-sampling errors' and identified under two major categories as 'response errors' and 'non-response errors'. Non-response errors occur when the respondent refuses to respond or stays without completing the questionnaire fully. As this study applied a snowball sampling technique with referrals, the non-response rate was kept to a low level. When designing the questionnaire, including a statement from the researcher emphasising the importance of the respondent's responses, promising their anonymity providing the full contact details of both the student and the supervisor, inserting the university logo, providing clear information and guidelines were taken as strategies to reduce non-response rate by enhancing the respondents' confidence.

Response error mainly stem from main three parties; respondents, researcher and the interviewer. The respondent may not provide accurate answers, mainly due to inability and unwillingness. As strategies in selecting respondents who can answer the questionnaire, they were screened for their previous use of self-service technologies. A list of SSTs was provided in Section A (beginning) of the questionnaire to make respondents familiar with the self-service technology options and their frequency of usage. Apart from that, even if they were low in their usage, multiple response options were provided for them which matched their likely responses. Questions that needed recall were not included in the questionnaire. Further, the examples were provided to ensure the understanding of some questions. To reduce unwillingness, every attempt was made to make the questionnaire simple. Most of the questions were closed-ended to reduce the effort needed in responding. There were no sensitive questions, and response options for demographic details were in categories, rather than questioning specific details. Use of simple language, clear instructions and guidance and clear separation of different sections were used as strategies.

Interviewer error was minimised in this study since the interviewers were not hired. The self-administered questionnaires were prepared, organised and produced in such a manner that the respondents could understand and fill them easily. Researcher error was controlled at every stage of sampling, questionnaire preparation, data collection and data analysis. The questionnaire of the quantitative study is provided in the annexure v.

CHAPTER THREE - SECTION FIVE - PART FOUR

QUANTITATIVE DATA ANALYSIS PROCEDURE

3.5.4.1 Introduction

This section begins by explaining the procedure for data cleaning with missing value analysis and recognising outliers. Next, the procedures for analysing normality, linearity, multicollinearity are explained. Exploratory Factor Analysis (EFA), Confirmatory Factor analysis (CFA) and Structural Equation Modelling (SEM) with AMOS are described as the data analysis techniques in this study. Finally, the approaches taken for examining the validity and reliability of the data and the model fit are explained. The findings of the study are presented in Chapter Four.

3.5.4.2 Data cleaning

Hair et al. (2013:68) state that the two main steps of data cleaning as 'missing data analysis' and 'outlier detection'. The following describes the preliminary data cleaning approaches.

Treatment for missing values: Missing data is a common problem for any empirical research (Altman & Bland, 2007). However, treatments for missing data have been overlooked in many study fields including marketing (Tsikriktsis, 2005). The interest of estimation of missing data was first introduced by Little & Rubin (1987) as a problem which can occur in any situation due to practical issues such as errors in data entry, disclosure restrictions, or failure to complete the entire questionnaire. (Tsikriktsis, 2005).

Hair et al. (2013) suggest to classify missing values according to their extent and patterns, as 'Missing At Random' (MAR), 'Missing Completely At Random (MCAR) and 'Not Missing At Random' (NMAR) (Tsikriktsis, 2005). MAR and MCAR represent cases with missing observations only by chance (for instance simply missing while completing the questionnaire), and therefore these missing values can be ignored and these types of data are generalizable (Tabachnick & Fidell, 2013). In NMAR, there is a relationship between variables with missing data and variables where values are present, mainly due

to the existence of poor wording or confusing items in the questionnaire, which the respondent purposely omitted (Parent, 2013). Therefore, with this type of missing data, the pattern needs to be investigated. Hair et al. (2013) advice to make sure that missing data are random (MAR or MCAR) and account for less than 10% of observations before selecting any of the missing data approaches.

Four methods are commonly used to treat missing data; a) the 'complete case approach' in which the cases with missing values are deleted, which is commonly known as list-wise deletion, b) the 'All available approach' known as pairwise deletion, c) impute missing data with estimated scores, and d) model-based approaches (Hair et al., 2013:571). Both list-wise and pair-wise deletion result in reducing the amount of data available for analysis. Therefore, unless the sample size is large enough and missing values are not MCAR, the list wise deletion will not become a fair strategy (Acock, 2005). In data imputation, the researcher can replace the missing value with a single (single imputation) or multiple estimations (multiple estimations) (Langkamp et al., 2010). A commonly used method in single imputation is mean substitution which would be a bad guess, since extreme cases are highly likely to refuse to answer some questions (for example: income level) (Acock, 2005). Imputation with the median is also a commonly practised missing value analysis technique. Further, these traditional methods (deletion, mean substitution) create type II errors and wrong interpretations (Langkamp et al., 2010).

Several new approaches have been introduced for dealing with missing values, to overcome the drawbacks of traditional methods. Expectation maximisation (EM) is implemented in SPSS, allowing missing data to be imputed with maximum likelihood values (Acock, 2005). Structural equation modelling and multilevel software packages have multiple ways of working with missing values. The 'full information maximum likelihood approaches' (FIML) is available in SEM software (AMOS, MPLUS) and does not impute missing values, but uses all available information to provide maximum likelihood estimate. Hair et al. (2013) note that FIML is appropriate if a researcher plans to adopt a model-based remedy.

This study employed several strategies to reduce missing values in the dataset and if they occurred, to handle them with proper care. These strategies are discussed in detail in the '4.2.1. Treatment of missing values' sub section in quantitative data analysis chapter.

Recognition of outliers and atypical cases: Outliers are identified as "observations with a unique combination of characteristics identifiable as distinctly different from the other observations" (Hair et al., 2013:62); specifically, "observations or measures that are suspicious because they are much smaller or much larger than the vast majority of the observations" (Cousineau & Chartier, 2010:58). Outliers are perceived as 'data problems' that must be addressed (Aguinis et al., 2013). Three types of reasons for outliers have been identified by Liu et al. (2010): errors during data collection/data preparation, unpredictable measurement-related errors from participants due to misunderstanding of instructions/fatigue and the inclusion of participants who do not belong to the target population. Outliers create problems in a data set by altering the mean values, with more variability and artificially inflating the coefficient alpha reliability estimates (Liu et al., 2010).

Therefore, initial scanning of data should be conducted to ensure the accuracy of data recording. This process starts with simply investigating each respondent or item (raw or column in a dataset) (Liu et al., 2010). Aguinis et al. (2013) and Hair et al. (2013:63) suggest that the data screening process should initially focus on identifying 'error outliers' (procedural errors) which can occur due to errors in observation, recording, preparing data, computation, coding, data manipulation etc.

Hair et al. (2013:63) explain three approaches of detecting outliers as 'univariate detection', bivariate detection' and multivariate detection'. Univariate detection involves a process of "examining the distribution of observations for each variable in the analysis and select as outliers those cases falling within the outer ranges (high or low) of the distribution". As suggested by Aguinis et al. (2013) visual single construct techniques such as box plots can be used to recognise the presence of such outliers and followed up with quantitative approaches such as standard deviation and percentage analysis where standard scores are greater than ±2.5 or in large samples 4 (Hair et al., 2013). However, taking the standard deviation around the mean is recognised as a disadvantage since both of them are very sensitive to outliers (Leys et al., 2013). 'Bivariate detection' of outliers assesses pairs of variables using scatter plots, especially for the relationships between independent and dependent variables. Multivariate detection is to recognise multivariate outliers, which is an unusual combination of values for more than two variables. Mahalanobis distances represents "the distance of the vector of an observation from the

vector of sample means for all variables" whereas the larger the distance indicates the departure from multivariate normality (Gao et al., 2008:347). Mahalanobis distance values (Mahalanobis D^2 measure) are used to identify this, and to be regarded as an outlier, the D^2 should be higher while the probability estimate should be $p < .001$ (Tabachnick & Fidell, 2013; Kline, 2015). As Kline (2015:73) note, "high D^2 with low p values (usually recommended for this test as 0.001) lead to reject the null hypotheses (assuming cases come from the same population as the rest)" proving the presence of multivariate outliers.

Hair et al. (2013) suggest first examining the univariate outliers and then moving to bi-variate outliers and finally to recognise multivariate outliers for all variables. However, after identifying potential outliers, root cause analysis should be conducted because values at the end of distribution typically seem to be outliers and just removing these data points without verification could result in unnecessary loss of data (Walfish, 2006). The same strategy is suggested by Hair et al. (2013) who argue that the researcher should compare outliers with the remainder of the population to see whether they are actual outliers or the respondent's true estimations. The researcher should not designate too many observations as outliers and should not eliminate them just because they are different, since deleting outliers increases the risk of limiting generalizability (Hair et al., 2013). The approaches taken in this study to recognise and treat outliers are explaining in the 4.2.2. subsection in the quantitative data analysis chapter.

3.5.4.3 Testing assumptions of multivariate analysis

Meeting the assumptions are critical in successful multivariate analysis, and they typically need to be tested twice, first for the separate variables, and second for the multivariate model (Hair et al., 2013).

Normality analysis: The very basic multivariate assumption is normality, which explains the shape of the data distribution for a metric variable which can be understood by examining two measures: kurtosis and skewness (Field, 2013; Hair et al., 2013). Kurtosis denotes the "peakedness" (height) of the distribution compared to the normal distribution, whereas 'leptokurtic' distributions are taller (peaked) and 'platykurtic' distributions are flatter. Skewness explains the 'balance of the distribution' which can be centred, known

as ‘symmetrical’, shifted to the left, ‘positively skewed’ or shifted to the right, ‘negatively skewed’ (Hair et al., 2013:69).

Normality can be statistically tested with the KS test, although it has its inherent limitation of being sensitive to large sample sizes (Field, 2013). In addition, normality can be graphically tested with histogram, pp plot etc. However, the sample size should be considered to determine whether these normality issues are large enough to be of concern. Hair et al. (2013) state that since increased sample size is tends to increase statistical power while reducing sampling errors, normality issues are negligible in sample sizes greater than 200. Field (2013) also states that the non-normality issues can be ignored when the sample size is large. The following chapter reports the normality issues with the data and approaches taken to solve them in 4.3.1: assessment of normality sub section.

Multicollinearity: Multivariate techniques assume a linear association between variables and exploring the scatterplots of the variables is the easiest way to identify nonlinear patterns in the data (Field, 2013). Both multicollinearity and singularity are the issues in a correlation matrix, whereas multicollinearity occurs when variables are too highly correlated, and singularity occurs due to perfect correlations (Tabachnick & Fidell, 2013:88). The presence of multicollinearity or singularity indicates the existence of redundant information and suggests that not all these variables are needed for the same analysis (Tabachnick & Fidell, 2013).

The structural models, involve problems of multicollinearity with other predictor variables/constructs, show extremely high correlations coefficients (over .90) between variables (Hair et al., 2013). The degree of multicollinearity can be identified by examining the R matrix, tolerance and Variance Inflation Factor (VIF) (Hair et al., 2013). For data to be considered as free from multicollinearity issues, tolerance should be less than 1, and the VIF should be less than 10 (Hair et al., 2013). The sub section 4.3.2. of the following chapter explains how this study fulfils the assumption of multicollinearity.

3.5.4.4 Data analysis techniques

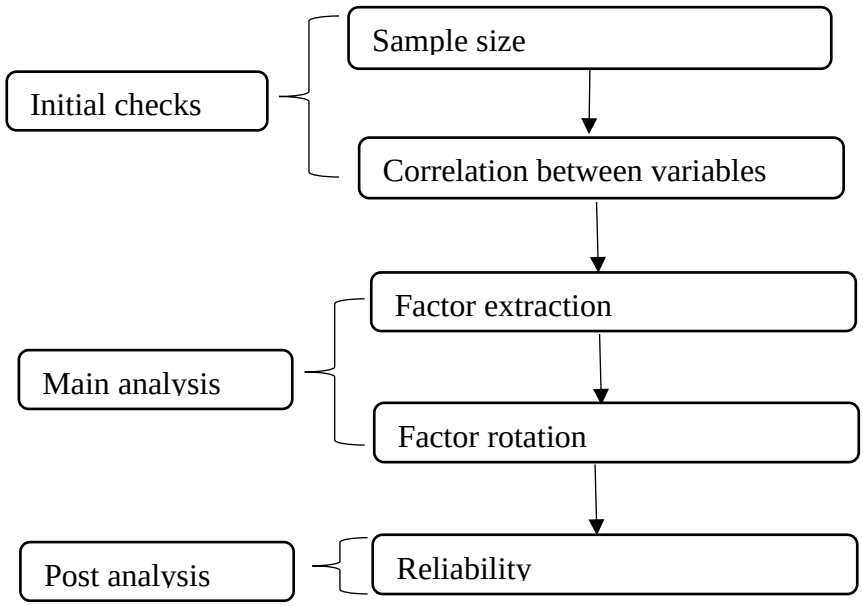
Apart from the descriptive statistics used in classifying the data, this study used Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) to analyse data.

3.5.4.4.1 Exploratory Factor Analysis

Exploratory factor analysis, explores the data and provides information about how many factors are needed to represent the data optimally. EFA is generally used for data reduction, to determine a smaller set of variables than those in the original set (Hair et al., 2013). It is typically used in theory building (Tabachnick & Fidell, 2013) when the factor structure of the data set is unknown, or the links between observed and latent variables are not very clear (Byrne, 2016). It is typically applied to a "single set of variables when the researcher is interested in discovering which variables in the set form coherent subsets that are relatively independent of one another" (Tabachnick & Fidell, 2013:612).

Since the variables in this study were developed mainly based on the findings of the qualitative study, in comparison with the available literature, it is reasonable to begin with EFA. Field (2013:684) explains the steps in exploratory factor analysis as follows.

Figure 3. 12: Steps in Exploratory Factor Analysis



Source: Field (2013:684)

Sample size: Before performing an exploratory factor analysis, there are some key issues to be considered at the initial stage. First, it is necessary to make sure whether the sample size is enough to perform an exploratory factor analysis. The optimum sample size depends upon the parameters of the phenomenon under study (Marshall, 1996). Tabachnick & Fidell (2013:613) suggest having over 300 while Hair et al. (2013) propose a 1:5 to 1: 10 item to response ratio. DeVellis (2003) suggests around 300 respondents and Hinkin (1998) proposes 200 respondents as appropriate. Field (2013) suggests over 300 cases as adequate. Hair et al. (2013) note that the sample should have more observations than variables and the minimum should be fifty observations. Quoting MacCallum et al. (1999), Tabachnick & Fidell (2013:618) note that "the impact of the sample size is reduced with consistently high commonalities (greater than 0.6) and well determined factors and in such cases, the sample size below 100 is also acceptable". The sample size mainly matters in EFA in interpreting the factor loadings and commonalities, as commonalities become lower when sample size increases and low factor loadings become statistically significant in big samples. Kaiser–Meyer–Olkin (KMO) measures of sampling adequacy represents the 'ratio of the squared correlation between variables to the squared partial correlation between variables', and supposed to be over 0.7. (Field, 2013:684). This study comprised with 493 usable cases, which is accepted as adequate to perform multivariate analysis. The findings of KMO tests are provided in the annexures.

Correlations between variables: Field (2013) suggests that looking at correlations between variables is the first thing to do when conducting factor analyses. Both very low correlations and very high correlations create potential problems and therefore it is necessary to remove such variables from the analysis. According to Field (2013), correlations below 0.3 and above 0.9 create such problems. However, he explains it as highly subjective with different data sets and therefore following such rules requires considerable skills. Further, Bartlett's test explains whether the correlation matrix is significantly different from the matrix which correlations are set as 0 (identity matrix). Therefore, the significance of Bartlett's test represents that the 'correlations between variables are significantly different from Zero'. Further multicollinearity (variables that are highly correlated) and singularity (variables which are perfectly correlated) will be potential problems in factor analysis. The related analyses are elaborated in the next chapter.

Factor extraction: Next, it is necessary to select basic extraction methods for EFA. Preliminary Component Analysis (PCA) assumes no measurement errors, and therefore it is not considered as a good factor analysis method (Field, 2013). Among others, principal axis factoring and the maximum likelihood method are recognised as appropriate. The maximum likelihood method "estimates factor loadings for population that maximises the likelihood of sampling the observed correlation matrix" and is especially useful when further performing confirmatory factor analysis (Tabachnick & Fidell, 2013:638).

Eigenvalues indicate the substantive importance of a given factor, and it is reasonable to keep only factors with large eigenvalues (Hair et al., 2013). Field (2013) focusing the Kaiser criterion, (Kaiser, 1970), suggests to retain factors with Eigenvalues greater than one (>1). The scree plots are used to plot the Eigenvalues of each factor (Eigenvalue in Y-axis and factors in X-axis) and helps to understand the relative importance of each factor. However, the results of extraction are similar regardless of the different methods used and further, if differences occur, they tend to disappear after rotation (Tabachnick & Fidell, 2013).

Factor rotation method*:* "Rotation is ordinarily used after extraction to maximise high correlations between factors and variables and minimise low ones" (Tabachnick & Fidell, 2013:625). There are two kinds of factor rotation methods: orthogonal rotation and oblique rotations. Orthogonal rotation assumes that factors are independent or uncorrelated with each other and therefore does not represent the reality (Tabachnick & Fidell, 2013). If the researcher believes that the research process is practically independent and therefore factor co-relations are minimal, it is appropriate to proceed with the orthogonal (uncorrelated) method.

Oblique rotations allow correlations between factors and provide a realistic view of the data (Field, 2013). Tabachnick & Fidell (2013:651) suggest observing the correlations among factors in order to select between orthogonal and oblique rotations. If factor correlations are around 0.32 or above, it suggests that there is 10% or more overlap in variance among factors and therefore, oblique (correlated) method is appropriate. Among the oblique rotations (direct oblimin and promax), direct oblimin is suggested as appropriate (Brown, 2009). This study used oblique rotations with direct oblimin as further explained in the findings chapter.

Factor loadings: Stevens (2002) states that the significance of factor loadings depends on the sample size, as small loadings could be statistically significant in very large samples. According to him, if the sample size is around 50, a loading of 0.722 can be considered significant, while for a sample of 100, the loading should be greater than 0.512, for 200, greater than .364, for 300, greater than 0.298, for 600, greater than 0.21, and for sample size of 1000 it should be greater than 0.162, to be statistically significant. However, he recommends factor loadings greater than 0.4 as appropriate.

3.5.4.4.2 Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) is a confirmatory approach, use to test 'how well the measured variables represent smaller number of constructs' (Hair et al., 2013:602). CFA is appropriate to situations where the researcher has some understanding of the latent variable structure (Byrne, 2016). In SEM, the CFA model is known as the 'measurement model' which assigns indicator variables into constructs. A proper understanding of the quality of the measures can be obtained when the findings of CFA are amalgamated with the construct validity (Hair et al., 2013). Among the estimation techniques, maximum likelihood estimation is recognised as efficient and flexible in producing the "most likely parameter values to achieve the best model fit" (Hair et al., 2013:575).

EFA results can be useful in developing theory and propose a measurement model and later tested through CFA. CFA provides information on whether the theoretical specification of the factors matches reality, enabling the researcher to either confirm or reject the pre-determined hypotheses (Hair et al., 2013). After the measurement model is correctly specified, the model should be tested for the model fit, validity and reliability to verify the extent to which the model/research is accurate.

1.5.4.4.2.1 Assessing the measurement model

The measurement model is developed by allocating indicator variables to the constructs that they represent and can be considered as a key activity in performing structural equation modelling. The goodness of fit indicates the similarity between the observed covariance matrix (reality) and the estimated covariance matrix (theory) and is measured through three main types of fit indices: absolute fit indices, incremental fit indices and parsimony fit indices (Hair et al., 2013). If the values of these two models are close, the

model is recognised as having a good fit. The validity of the model is determined by the goodness of fit measurements and the evidence of construct validity (Hair et al., 2013).

Absolute fit indices: Absolute fit indices provide direct measures to indicate that the extent to which the model presented by the researcher reproduces the observed data (Hair et al., 2013). Techniques used within this category include:

Chi-Square test: Chi-Square represents the difference between observed and estimated covariance matrices (Hair et al., 2013). This value is influenced by the sample size and the number of observed variables, when the sample size and /or number of observed variables increase, the chi value also increases. Therefore, chi square value is not identified as a sole Goodness of Fit measurement. SEM prefers small chi values (fewer differences in between observed and estimated matrices) with large p values (insignificant, above 0.05). However, these values will be less meaningful to large samples, and therefore some alternative model fit indices are used (Hair et al., 2013).

The Goodness of Fit Index (GFI): GFI is also recognised as sensitive to sample size and therefore its usage has declined in contemporary studies (Hair et al., 2013). It ranges between 0-1 where higher values closer to 1 are recognised as a good fit (Byrne, 2016). In the past GFI over 0.90 was identified as good, whereas now, scholars consider values over 0.95 as appropriate (Hair et al., 2013).

Root Mean Square Error of Approximation (RMSEA): This is a very good alternative for large samples or datasets with a lot of variables, which are rejected by the chi-square GOF test (Hair et al., 2013). Values less than 0.05 show a good fit whereas 0.08 - 0.10 indicates a mediocre fit and over 0.1 represents a poor fit (MacCallum et al., 1996). RMSEA has the advantage to construct the confidence intervals when it is in between 0.03 and 0.08 (Hair et al., 2013).

Root Mean Square Residual (RMR) and Standardized Root Mean Square Residual (SRMR): RMR is the ‘ average residual value derived from the fitting of the variance-covariance of the sample data’, and SRMR represents the ‘average value of all standardised residuals’ (Byrne, 2016:94). SRMR ranges from 0 to 1 and lower values (0.05 or less) indicate better fit of the model (Byrne, 2016) while values over .1 indicate a problem in model fit (Hair et al.,2007). RMR, SRMR and

RMSEA are known as ‘badness of -fit indices’ since high values of these indices represent a bad fit (Hair et al., 2013).

Incremental fit indices: Incremental fit indices assess the extent to which the estimated model fits compared to some alternative baseline model, mainly the ‘null model’, which assumes that all observed variables are un-correlated (Hair et al., 2013). Among the many, following incremental fit indices, TLI and CFI are widely reported (Hair et al., 2013).

Normed Fit Index (NFI): NFI is the ‘ratio of the differences in the χ^2 value for the fitted model and null model divided by the χ^2 value for the null model’ (Hair et al., 2013:580). The value ranges from 0-1, and perfect model fit is represented by 1. As drawbacks, this index may be artificially inflated by complex models.

Tucker Lewis Index (TLI): This index takes the model complexity into consideration and compares normed chi-square values of the both null and specified models (Hair et al., 2013). TLI values can be below 0, and above 1. A value good fit indicates near 1 indicates a good fit.

Comparative Fit Index (CFI): CFI is an improved version of NFI. This value lie between 0-1, with higher values, over 0.90 indicating a good fit (Hair et al., 2013).

Parsimony fit indices: Parsimony Fit Indices show the best model among competing models considering fit and complexity (Hair et al., 2013). Therefore, these fit indices are more suited to compare two models, in which one is complex and the other is simple, than assessing a single model. These indices include:

Parsimony Goodness of Fit Index (PGFI): It takes the model complexity into account, and these values generally should be lower than the GFI values to be acceptable (Byrne, 2016).

Parsimony Normed Fit Index (PNFI): This is used to compare two models in which the highest PNFI represents the better fit.

Hair et al. (2013) report three main types of bad practices (compromises) that researchers do to improve model fit: 1) reducing the items in a construct, 2.) conducting separate analysis for each construct instead of performing one analysis for the entire model, 3) reducing the sample size.

The following table describes cut-offs for different fit indices based on the sample size and the number of variables as suggested by Hair et al. (2013). According to that, this study belongs to the category where the sample size is above 250 (N>250) and the number of variables is more than 30 (M≥30), and therefore, a significant χ^2 value is expected. For the model to be accepted, CFI should be above 0.90, RNI should be above 0.90, SRMR should be 0.08 or less, and RMSEA should be less than 0.07.

Table 3. 14: Cut-offs for different fit indices

	If Sample size is less than 250			**If Sample size is more than 250**		
Number of Variables	**m≤12**	**12<m<30**	**m≥30**	**m≤12**	**12<m<30**	**m≥30**
X^2	Insignificant P values are expected	Significant P values even with good fit are expected	Significant P values are expected	Insignificant P values even with good fit are expected	Significant P values are expected	Significant P values are expected
CFI or TLI	.97 or higher	.95 or higher	Above .92	.95 or higher	Above .92	Above .90
RNI	May not diagnose Misspecification well	.95 or better	Above .92	.95 or better, not used with N > 1,000	Above .92, Not used with N > 1,000	Above .90, not used with N > 1,000
SRMR	Biased upward, use other indices	.08 or less (with CFI of .95 or higher)	Less than .09 (with CFI above .92)	Biased upward; use Other indices	.08 or less (with CFI above .92)	.08 or less (with CFI above .92)
RMSEA	Values < .08 with CFI = .97 or higher	Values < .08 with CFI of .95 or higher	Values < .08 with CFI above .92	Values < .07 with CFI of .97 or higher	Values < .07 with CFI of .92 or higher	Values < .07 with CFI of .90 or higher

Source: Hair et al. (2013:584)

3.5.4.4.3 Structural Equation Modelling

The research aims, objectives and the nature of the data in this study require an analysis technique which allows simultaneous analysis of multiple measurements. 'Multivariate analysis' techniques permit such practices. However, many traditional multivariate analysis techniques have a common drawback of allowing examination of only a single relationship at a time (Hair et al., 2013). Therefore, in a situation where the researcher wants to solve some interrelated problems, traditional multivariate analysis methods may not a perfect choice. 'Structural Equation Modelling' (SEM) can provide a solution to this problem by simultaneously investigating a series of dependence relationships (Hair et al., 2013).

SEM takes a confirmatory approach to analyse hypotheses and structural theories (Byrne, 2016). Further, traditional multivariate procedures are not good for assessing or correcting measurement error like SEM. Whereas traditional methods are based on only observed measurements (manifest variables, indicators), SEM can incorporate 'latent variables' (unobserved factors) which are hypothesised concepts measured indirectly by using some other representative observable variables (Hair et al., 2013). SEM can be viewed as a family of statistical models (Hair et al., 2013) and especially as a distinct mixture of two multivariate analysis techniques: factor analysis and multiple regression (Hair et al., 2013). This model determines the goodness of fit between the hypothesised model and the sample data, although a perfect fit is highly unlikely.

SEM consists of two basic models: the measurement model and the structural model. The measurement model represents the connection between observed (items) and latent (constructs) variables (Hair et al., 2013). After completing the measurement model, tests for measurement errors (validity and reliability) should be conducted. After developing a valid measurement model, the researcher can specify the structural model: the path model which represents the structural relationships between latent constructs or independent and dependent variables. Validating the structural model is also essential, and the researcher must check the model fit before testing any relationships. Model fit is decided by "the correspondence between the observed covariance matrix and the estimated covariance matrix that results from the proposed model" (Hair et al., 2013:552). SEM is a popular methodology among non-experimental researchers where theories are not well developed in testing (Byrne, 2016).

This research investigates to examine some interrelated issues, namely, how customer value co-creation intention in self-service technologies leads to their co-creation practices and destructions, and finally to their experiences. Therefore, among the multivariate techniques, this study selected SEM as appropriate. As Hair et al. (2013) suggest, initially, the measurement model was developed and checked for validity, reliability and model fit. Then the structural model was developed, and hypotheses were checked after confirming the validity and reliability of the structural model. The information about measurement and structural models are discussed in detail in the data analysis chapter.

3.5.4.5 The software for data analysis

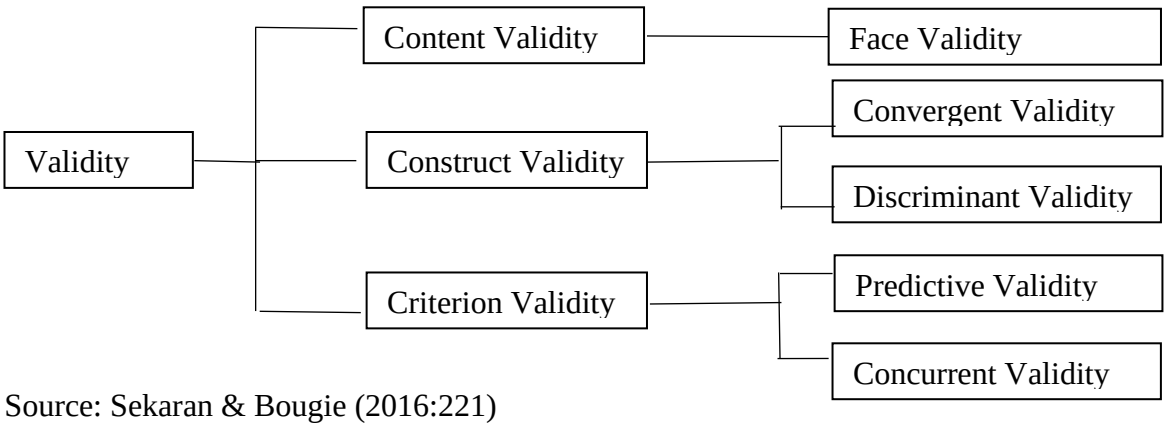
Programs such as LISREL (LInear Structural RELations), AMOS (Analysis of Moment structures), EQS, Mplus and CALIS are the most common software programs which allow structural equation modelling, with a few differences in selection, applications and results. Ultimately, selection of the software depends upon the researcher's preference and availability (Hair et al., 2013).

AMOS is an extension of SPSS and provides co-variance based analysis in SEM with easy to handle programs with visual elements (Arbuckle, 2016). It allows modifications, assessing model fit, and obtaining graphical and tabular results. Hair et al. (2013:570) recommend using co-variance-based SEM whenever possible, since covariance matrices provide more flexibility in analysis. Since AMOS is the licenced version used in the Hull University Business School, this study used this software in the main data analysis.

3.5.4.6 Validity of the measure

It is essential to establish the 'goodness' of the measure, ensuring that the research instrument accurately measures all the variables that it is supposed to do. Validity and reliability can be used to ensure that the measures developed are reasonably good (Sekaran & Bougie, 2016). Validity is the "degree to which a measure accurately represents what it is supposed to" (Hair et al., 2013:7) and it ensures the accuracy of the measurement. Sekaran & Bougie (2016) classify validity into three main categories, as illustrated in the following figure.

Figure 3. 13: Types of validity



Source: Sekaran & Bougie (2016:221)

Content validity: Content validity needs to be ensured before testing the model and the theory, to understand items' content or meaning (Hair et al., 2013). It is a subjective as well as a systematic evaluation of the content of the instrument (Shukla, 2008) and checks whether it includes a sufficient and representative set of items to measure the concept. Face validity shows that "the items that are intended to measure a concept do , on the face of it, look like they measure the concept". A panel of judges (experts) can verify the content validity (Sekaran & Bougie, 2016:221).

Construct validity: Construct validity connects the theory and the measurement instrument (Shukla, 2008). Hair et al. (2013:618) define construct validity as "the extent to which a set of measured items actually reflects the latent theoretical construct those items are designed to measure". Sekaran & Bougie (2016:222) note that construct validity is used to measure "how well the results obtained from the use of the measure fit the theories around which the test is designed". Construct validity is composed of four components: convergent validity, discriminant validity, nomological validity and face validity (Hair et al., 2013).

Convergent Validity: Convergent validity is the principle that "the items that are indicators of a specific construct should converge or share a high proportion of variance in common" (Hair et al., 2013:618). Sekaran & Bougie (2016:222) note that convergent validity is established "when the scores obtained with two different instruments measuring the same concept are highly correlated". It can be ensured by checking factor loadings, items' commonality, average variance

extracted, reliability etc. (Hair et al., 2013). Generally, all the factor loadings should be higher than 0.05 or even better over 0.07, and statistically significant preferably at the 0.01 level or at least at 0.05 level (Hair et al., 2013). Commonality (Variance extracted) is the "square of the standardised factor loadings", and Average Variance Extracted (AVE) is the "mean-variance extracted for the items loading on a construct" (Hair et al., 2013:619). AVE should be greater than 0.5, and if not, it indicates that "more error remains in the items than variance explained by the latent factor" on average. Construct reliability (CR) is also an indicator of convergent validity. It is calculated using the "squared sum of factor loadings for each construct and the sum of the error variance terms for a construct" and the value should be greater than 0.7, although in-between 0.6 and 0.7 are also accepted (Hair et al., 2013:619)

Discriminant Validity: Discriminant validity represents the "extent to which a construct is truly distinct from other constructs", and therefore higher values indicate that the constructs are distinct. The most common way of evaluating discriminant validity in CFA is to "compare the average variance-extracted values for any two constructs with the square of the correlation estimate between these two constructs and the variance extracted estimates should be greater than the squared correlation estimate", indicating that the particular latent construct explains more of the variance than that it shares with another construct (Hair et al., 2013:620).

Criterion-related validity: Criterion-related validity is recognised "when the measure differentiates individuals on a criterion it is expected to predict". Concurrent validity is established "when the scale discriminates individuals who are known to be different that is they should score differently on the instrument". Predictive validity shows the "ability of measuring instrument to differentiate among individuals with reference to a future criterion" (Sekaran & Bougie, 2016:221).

Sekaran & Bougie (2016) discuss different types of validities that determine the 'goodness of measures'.

Table 3. 15: Types of validity

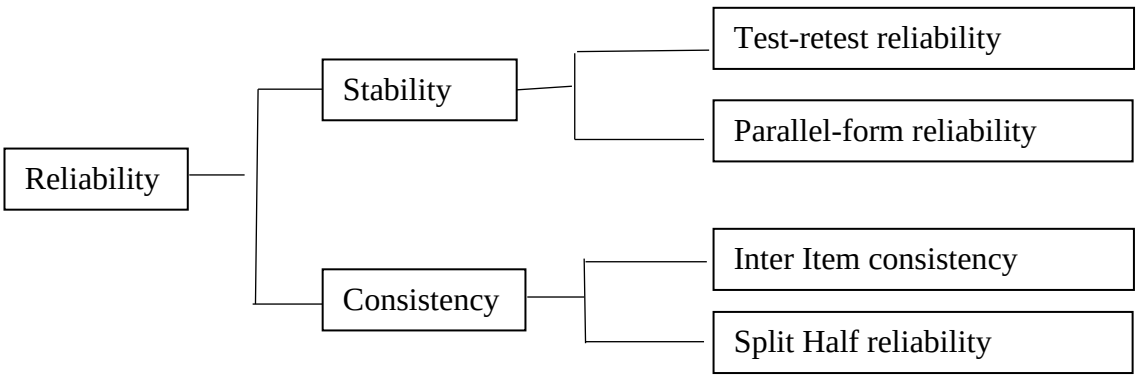
Validity	Description
Content validity	Does the measure adequately measure the concept?
Face Validity	Do 'experts' validate that the instrument measures what its name suggests it measures?
Criteria/related validity	Does the measure differentiate in a manner that helps to predict a criterion variable?
Concurrent validity	Does the measure differentiate in a manner that helps to predict a future criterion?
Construct validity	Does the instrument tap the concept as theorised?
Convergent validity	Do two instruments measuring the concept correlate highly?
Discriminant validity	Does the measure have a low correlation with a variable that is supposed to be unrelated to this variable?

Source: Sekaran & Bougie (2016:223)

3.5.4.7 Reliability of the measure

Reliability states that "a measure (or in this case questionnaire) should consistently reflect the construct that it is measuring" (Field, 2013:706). It indicates "the extent to which it is without bias" and ensures the consistency across time and across the various items in the instrument' (Sekaran & Bougie, 2016:223). Reliability measures mainly the 'stability' and 'consistency' of an instrument.

Figure 3. 14: Types of reliability



Adapted from (Sekaran & Bougie, 2016:221)

Stability measures ensure the capability of a measure to stay constant over time, being less vulnerable to changing situations. The stability of a measure can be assessed through test-retest reliability and parallel forms reliability. Test-retest reliability checks the correlation between the scores if the questionnaire is distributed to the same respondents at two different times. Parallel form reliability occurs when responses on two comparable sets of measures used to measure the same construct are highly correlated.

Internal consistency indicates "the homogeneity of the items in the measure that taps the construct". Cronbach's alpha is commonly used to measure inter-item consistency reliability. Split half reliability reflects the "correlation between the two halves of the questionnaire" (Sekaran & Bougie, 2016:224). The results of the validity and reliability tests used in this study are described in detail in the data analysis chapter.

3.6 Demographic profile of the respondents

This section explains the sample profile, focusing mainly on their socio-demographic factors such as gender, age, employment, education level and the duration of staying in the United Kingdom. The sample consisted of 493 respondents, were classified on these bases, and the information is provided in the following tables.

Table 3. 16: Sample profile: Gender

Gender	Frequency	Valid Percent
Male	265	53.8
Female	228	46.2
Total	493	100

The sample is fairly equally distributed between females and males, although the male population is slightly higher (53.8%) than the females (46.2%).

Table 3. 17: Sample profile: Age group

Age Group	Frequency	Valid Percent
18-24 Years	66	13.4
25-34 Years	132	26.8
35-44 Years	103	20.9
45-54 Years	115	23.3
55-64 Years	64	13.0
65 or older	13	2.6
Total	493	100

The study is interested to see the difference between younger and older generations in their intentions, practices and experiences of self-service technologies. Therefore, an attempt was made to include a mix of age categories in the sample. However, older people were reluctant to fill in the questionnaire and many refused to do so. In these circumstances, the majority of the sample were represented by 25-35 age group (26.8%) while above 65 age group was limited to 2.6%.

Table 3. 18: Sample profile: Employment

Employment	Frequency	Valid Percent
Full time employed	277	56.2
Part-time employed	90	18.3
Self employed	31	6.3
Unemployed	83	16.8
Retired	12	2.4
Total	493	100

The majority of the sample were full time employees (56.2%). The retired category represented the least, 2.4% while 16.8% of respondents described themselves as unemployed.

Table 3. 19: Sample profile: Education level

Education level	Frequency	Valid Percent
GCSE level	35	7.1
GCE A/L	95	19.3
University Degree or equivalent	139	28.2
Postgraduate level	148	30.0
Other qualifications	76	15.4
Total	493	100

Most of the respondents (58.2%) were qualified with a university degree/ equivalent or postgraduate level studies. 22.5% of people had GSCE or other kinds of qualification.

Table 3. 20: Sample profile: Duration of staying in UK

Duration of staying in UK	Frequency	Valid Percent
Less than 1 year	7	1.4
1-5 years	75	15.2
6-10 years	125	25.4
More than 10 years	140	28.4
Since birth	146	29.6
Total	493	100

58% of respondents had lived in the UK for more than ten years, while 29.6% among them had lived in the UK since birth. Very few respondents (1.4%) had lived in the UK for less than one year.

3.7 Individuals' usage of self-service technologies

Apart from the above socio-demographic information about respondents, the researcher wanted to understand individuals' frequency of usage of different types of self-service technologies. In line with Meuter et al. (2000:52) classification of self-service technologies, customer usage was analysed for main four SST types: telephone-based SSTs, internet based SSTs, interactive kiosks and CD/DVD based SSTs. the response frequencies and percentages are shown in the table 3.21.

According to the responses, the most highly used self-service technology option was Automated Teller Machines (ATMs), a type of interactive kiosks, 85.3% of the respondents reported using 'often' or 'always'. Other interactive kiosks such as self-service fuel pumps, car parking payment machines and self-service checkouts at supermarkets were each used by more than 50% of the respondents on a frequent basis (often or always).

Internet based self-service technologies were also a highly used type of SSTs; people indicated that they often or always engaged with online information search (75.3%), online banking (73.2%) and online shopping (65.1%). Apart from distance learning, all the other internet-based SSTs options in the list were used by more than 50% of the people on a frequent basis. People who never used internet-based technologies were very few, such as online banking (6.9%), online shopping (4.3%) and online information search (1%).

Compared to the internet-based SSTs and interactive kiosks, customer usage of telephone-based SSTs and CD/DVD based SSTs was reported as low, with the following reported frequent usage of telephone banking (18.3%), order status checking via telephone (12.2%), customer service call centres (17.1%) and information (self-help) telephone lines (13.6%). Around 25% of the respondents had never used telephone banking, while that percentage was respectively 27.8%, 10.8% and 35.1% in the usage of order status checking via telephone, customer service call centres and self-help telephone lines.

The study found that usage of CD/DVD based self-service technologies was comparatively rare with the responses in the never used category ranging from 23%-27%. Only 12-18% of people reported that they frequently used these types of SSTs.

Table 3. 21: Customer usage of different types of SSTs

	SST Type	Customer Usage				
		Never (%)	Rarely	Sometimes	Often	Always
Telephone Based SSTs	Telephone Banking	121 (24.5)	161 (32.7)	121 (24.5)	57 (11.6)	33 (6.7)
	Order status checking via telephone	137 (27.8)	166 (33.7)	130 (26.4)	37 (7.5)	23 (4.7)
	Customer service call centers	53 (10.8)	163 (33.1)	193 (39.1)	66 (13.4)	18 (3.7)
	Information (self-help) telephone lines	173 (35.1)	173 (35.1)	80 (16.2)	47 (9.5)	20 (4.1)
Internet based SSTs	Online banking (financial transactions)	34 (6.9)	32 (6.5)	66 (13.4)	155 (31.4)	206 (41.8)
	Online shopping	21 (4.3)	33 (6.7)	118 (23.9)	211 (42.8)	110 (22.3)
	Package tracking	20 (4.1)	56 (11.4)	165 (33.5)	178 (36.1)	74 (15)
	Online information search	5 (1)	28 (5.7)	64 (13)	174 (35.3)	222 (45)
	Self-management of utility bills (Gas/water/electricity)	74 (15)	68 (13.8)	72 (14.6)	122 (24.7)	157 (31.8)
	Distance learning	226 (45.8)	122 (24.7)	84 (17)	42 (8.5)	19 (3.9)
Interactive Kiosks	Automated Teller Machines (ATMs)	12 (2.4)	18 (3.7)	42 (8.5)	122 (24.7)	299 (60.6)
	Automated check ins/checkouts at air ports/ hotels	99 (20.7)	108 (21.9)	111 (22.5)	109 (22.1)	66 (13.4)
	Self-service fuel pumps	102 (20.7)	42 (8.5)	64 (13)	124 (25.2)	161 (32.7)
	Car parking payment machines	78 (15.8)	43 (8.7)	65 (13.2)	165 (33.5)	142 (28.8)
	Self-checkouts at supermarkets	13 (2.6)	37 (10.1)	121 (24.5)	218 (44.2)	104 (21.1)
	Vending machines (products/ tickets etc)	38 (7.7)	102 (20.7)	174 (35.3)	141 (28.6)	38 (7.7)
	Blood pressure monitors	235 (47.7)	143 (29.0)	69 (14.0)	36 (7.3)	10 (2)
CD/DVD	Software or calculators on tax, mortgage, BMI	114 (23.1)	158 (32.0)	131 (26.6)	61 (12.4)	29 (5.9)
	CD/DVD/TV based self-learning	132 (26.8)	194 (39.4)	105 (21.3)	47 (9.5)	15 (3.0)

3.8 Chapter summary

This chapter has explained the strategies and methods employed in order to address the research questions empirically. The chapter commenced with section-1, recognising the suitable philosophical foundation for the study, comparing and justifying 'critical realism' as the underpinning theoretical foundation.

Section-2 of the chapter focused on discussing the research methodology used to achieve the research aims and objectives. The mixed methodology was used with a sequential exploratory design, in which the qualitative study followed by the quantitative study, using the findings of the qualitative study in developing the framework, hypotheses and research instrument for the quantitative study.

Section-3 explained the design of the qualitative study (study part one). Non-probabilistic purposeful sampling was used in selecting respondents for the qualitative study, and semi-structured interviews were conducted until data saturation was achieved. The analysis was made by a conventional content analysis procedure, and thematic analysis approach was used to identify initial themes.

The qualitative research findings were reported in section-4. The study identified eight factors as key influences on customer value co-creation intention in self-service technologies. Further, sixteen value co-creation practices were found, which were later categorised into five main themes.

Section-5 focused on describing the quantitative study design. A field survey was conducted to collect data for the quantitative study, with a sample chosen by a snowball technique. A pre-determined self-administered questionnaire was used as the data collection instrument. The data were mainly analysed with Structural Equation Modelling (SEM) with AMOS. The details of the analysis process and its outcomes are reported in the next chapter.

CHAPTER FOUR

QUANTITATIVE DATA ANALYSIS

CHAPTER FOUR

QUANTITATIVE DATA ANALYSIS

4.1 Introduction

The previous chapter reported the choice of an appropriate methodology for this research, with justifications. This chapter further explains the data analysis and reports the findings of the quantitative study (study 2). It begins by describing the practical approaches for data cleaning and testing multivariate assumptions.

The data analysis was conducted in three stages aiming at understanding, 1) customer value co-creation intention 2) customer value co-creation practices including the co-destructions, and 3) customer value co-creation experience in SSTs. Exploratory factor analysis (EFA), Confirmatory factor analysis (CFA), validity /reliability tests and model fit recognition were conducted separately for each of these stages. Finally, all these CFA models were combined and developed into the final measurement model and again examined for validity, reliability and model fit. The structural model that explains the sequential effect of customer value co-creation intention, practices and experience in self-service technologies was developed from this measurement model and used to test hypotheses, after confirming the model validity.

The findings of the study are presented in accordance with the guidelines and recommendations given by Schreiber et al. (2006) particularly for scholarly work based on CFA and Structural Equation Modelling (SEM) as primary statistical analysis techniques. The following table outlines the arrangement of presenting study findings.

Table 4. 1: Arrangement of presenting study findings

Pre-analysis	Data cleaning	Missing values, Outliers
	Multivariate assumptions	Normality, Linearity, Multicollinearity
Main analysis	Exploratory Factor Analysis	EFA findings
	Confirmatory Factor Analysis Measurement model Structural model	Model chi-square, Multiple fit indices
		Parameter estimates and significance tests
		Model respecifications
		Validity and reliability tests

Adapted from Schreiber et al. (2006)

4.2 Data cleaning

As Hair et al. (2013) suggest, this study performs two types of data cleaning methods: missing data analysis and outlier detection. The following describes the approaches followed in cleaning the data and the outcomes.

4.2.1 Treatment of missing values

This study employed several strategies to reduce missing values in the data and if they occurred to handle them with proper care. After receiving the questionnaires back from the respondents, they were screened to recognise partly filled questionnaires and these were eliminated in the first instance without being entered into the software (SPSS). Thereafter, questionnaires where participants responded as patterns or provided the same answer throughout a considerable length were omitted, assuming that they were filled in a careless, irresponsive or unthinking manner. After these two stages, 521 questionnaires were found to be suitable and entered into SPSS. As the next step, the data were checked against the answers given to the three fake questions that the researcher purposely included in the questionnaire, asking the respondent to circle the requested option (eg: Could you please circle 'Strongly Disagree' with this statement). The main purpose of these questions was to recognise respondents' level of concentration and reduce common method bias. Out of 521 completed questionnaires, none of the cases were identified as having irrelevantly marked answers to all three questions, only four provided irrelevant answers to two out of the three questions and 24 provided only one wrong answer. It was decided to eliminate these questionnaires from the data set resulting in 493 cases for further analysis. As Hair et al. (2013) suggest, this study eliminated questionnaires with data 'not missing at random (NMAR), by removing questionnaires that partly filled/ filled with patterned answers with less care (Parent, 2013).

After entering the data into the system, each item in the data set was checked for missing values (Column-wise) and if any values found were re-checked with the respective data form (questionnaire) to ensure whether it was actually missed by the respondent or missed in the data entering process. If errors were found in the data entering process, they were corrected at that level.

Missing value analysis (MVA) was conducted in SPSS v. 24.0 and it was found the presence of missing data in the study ranged from 0.0% to 0.8% at individual item-level

(below 10%) which is ignorable (Hair et al., 2013) (Annexure vi). The prior screening of questionnaires for missing values helped to retain missing data at such a minimum level. The results of Little's MCAR (Missing completely at random) test in the expectation maximisation (EM) technique revealed that the missing values were insignificant at each item level (i.e. Chi-Square = 9244.025, df = 9328, Sig. = .730) indicating that the patterns of missing values were completely at random.

Table 4. 2: Little's MCAR test

Chi-Square (χ^2)	DF	Sig
9244.025	9328	.730

AMOS, as the main software used in data analysis, does not allow any of the traditional methods (list wise deletion, pairwise deletion or single imputation) of handling missing values. The method used in AMOS is "Full Information Maximum Likelihood" (FIML) approach, which reduces the bias even though the MAR condition is not fully satisfied (Byrne, 2016). This study used the FIML approach in addressing missing data.

4.2.2 Recognition of outliers and atypical cases

Identification of 'error outliers' was initiated by locating outlying observations and separately investigating them to assess whether those outlying data were caused by any errors (actual error outliers) (Aguinis et al., 2013). Initial scanning of data was conducted to ensure the accuracy of recording by simply investigating each responses (row in a data set) (Liu et al., 2010), and it was found there few out-of-range data were due to typological errors (e.g. 6 was inaccurately typed as 66). They were treated by substituting the correct data points after re-checking with the respective questionnaire.

As suggested by Aguinis et al. (2013), visual single construct techniques such as box plots were used to recognise the presence of outliers and followed up with quantitative approaches such as standard deviation and percentage analysis. The box plots indicated some data points as outliers. However, standard deviations confirmed that they were within the limits of ± 2.24. Hair et al. (2013:65) suggest that standard scores can be even ± 4 in large samples and advise researchers not to designate too many observations as outliers and eliminate them, but instead carefully examine them to recognise whether they are true outliers or different evaluations of respondents. However, the presence of

univariate outliers in this study was not considered as a detrimental issue, since the study utilised a Likert scale with 7 points ranging from 1 - strongly disagree to 7 - strongly agree. If respondents answered strongly disagree or strongly agree, these responses might have become outliers, as they are the extreme points of the scale. Therefore, after carefully examining the univariate outliers, it was decided to keep them, since they represented respondents' true perception rather than being outliers.

Scatter diagrams were used as visual multiple construct tools to understand multivariate outliers, and followed up with a quantitative approach with Mardia's multivariate kurtosis which is used in AMOS by examining Mahalanobis distance. According to the test, 82 cases were recognised as multivariate outliers (Annexure vii), and since this study comprised 493 usable cases, it was decided to remove the multivariate outliers from the data set. After removing them, the data set was reduced to 411 cases, which is a 16.63% reduction from the original usable data.

4.3 Testing multivariate assumptions in analysis

Testing multivariate assumptions is a prerequisite in performing multivariate analysis. Normality, linearity, multicollinearity are considered as fundamental assumptions in multivariate analysis.

4.3.1 Assessment of normality

Normality was first assessed by examining skewness and kurtosis with related critical ratios. Hair et al. (2013) and Curran et al. (1996) suggest univariate skewness and kurtosis respectively ±2.00 and ± 7.00 as appropriate while Kline (2015) suggests they should be within ±3.00 and ±10.00. As shown in annexure viii, positive kurtosis values ranged from 0.050 to 4.3 while negative values ranged from -0.26 to -0.849 yielding an overall mean univariate kurtosis value of 2.02. When checking the skewness of the data, positive skewness values ranged from 0.116 to 0.956 while the negative values ranged from -0.095 to -1.474. These univariate skewness and kurtoses values show that the data were normally distributed. Standardised skewness values >3.0 is recognised as severely skewed while standardised kurtosis >10 suggests problems and >20 shows serious non-normality of the data (Kline, 2015:76). According to these criteria, a few variables indicated skewed characteristics.

The normality was further checked graphically using histograms (Hair et al., 2013) and statistically with K-S test (Field, 2013). Both graphical presentations (Histogram) and the mathematical analysis (KS test) indicate that the data are non-normal in this study. However, Field (2009) states that sensitivity to large sample sizes is a limitation of the KS test. Mardia's coefficient was used to test multivariate normality using AMOS (annexure: vix) and it was found that the multivariate normality assumption was not tenable (Mardia's coefficient = 535.823, CR = 73.871).

However, Tabachnick & Fidell (2013:78) note that "Central Limit Theorem reassures that, with sufficiently large sample sizes, sampling distributions of means are normally distributed regardless of the distributions of variables" and therefore it is possible to ignore the non-normality issues when the sample size is large. Similarly, Hair et al. (2013) note that, normality issues are negligible in the sample sizes greater than 200, because larger sample size decreases the negative effects of non-normality by increasing the statistical power and reducing the sampling errors. Therefore, the non-normality of the data can be ignored, given to the over 400 sample size in this study. Even though generally data transformations are used to correct the non-normality problems, Hair et al. (2013:75) suggest "remedying normality may not be needed due to sample size" especially when it exceeds 200. Additionally, Gao et al. (2008) suggest bringing the sample closer to normality by deleting outliers, which the study addressed as noted in the previous section.

Byrne (2016) notes that instead of the Maximum likelihood (ML) estimation which is default in AMOS, Asymptotic Distribution Free (ADF) estimation is an appropriate approach to analyse non-normal data. However, this approach is recognised as not producing rich results, unless the sample size is extremely large (1000-5000) (West et al., 1995). Rather than that approach, Kline (2015) suggests the practical value of 'bootstrapping', and this was used as the strategy for handling the non-normality of data in this study.

As Kline (2015:239) suggests, using the maximum likelihood approach, with non-parametric bootstrapping assumes that the "population and the sample distribution have the same shape". Further, as Arbuckle (2016) explains, apart from using bootstrapping to overcome multivariate assumption of non-normality of the data, it can be used to obtain standard errors (SEs) for every estimate and bias corrected confidence intervals for each

parameter. This study continues with bootstrapping on 1000 sample, using ML estimator as a solution to data non-normality.

4.3.2 Linearity, multicollinearity and singularity

All the multivariate techniques, including SEM, implicitly assume data linearity. 'Linearity' presumes a straight-line relationship between two variables and it is important to understand the nature of relationships, since Pearson's r only recognises linear relationships (Tabachnick & Fidell, 2013). Examining scatterplots is the widely used approach to assess linearity (Hair et al., 2013), and all the scatter plots graphed for this study show linear relationships among the variables.

Both multicollinearity and singularity are the issues in a correlation matrix, and therefore can be detected by simply scanning the correlation matrix of the predictor variables (Field, 2013). All the correlation coefficients were below 0.9, indicating that data are free from multicollinearity issues. Additionally, the degree of multicollinearity was assessed by examining the R matrix of predictor variables with tolerance and Variance Inflation Factor (VIF) (Hair et al., 2013). The VIF denotes whether the predictor variables in the model show any strong linear relationships with other predictors. VIF is greater than 10 and Tolerance values (1/VIF) below 0.1 signpost extreme multivariate collinearity (Kline, 2015). In this data set, the tolerance values ranged from 0.33 to 0.82 and the VIF between 1.2 to 2.9, staying within the accepted range (annexure x). Therefore, this data can be recognised as free from multicollinearity issues.

4.4 Data analysis procedure

Following data cleaning and checking for multivariate assumptions, the data analysis was conducted in three stages to understand customer 1) value co-creation intention, 2) value co-creation practices including co-destructions and 3) value co-creation experiences in self-service technologies as depicted in following figure.

The following analyses were conducted in achieving these aims.

- Exploratory Factor Analysis to understand factors in each research concept (value co-creation intention, practices and experiences in SSTs).
- Confirmatory Factor Analysis including developing measurement models for each stage and testing for model fit, validity and reliability.

- Developing the final overall measurement model, by combining the separate measurement models developed in previous stages, and testing for model fit, validity and reliability.
- Developing the structural model, which explains the sequential effects of customer value co-creation intention, practices and experiences in self-service technologies, testing for model fit and using in testing hypotheses.

4.4.1 Exploratory Factor Analysis

Exploratory factor analyses were conducted to examine the measurement structures and to understand how items correspond to different variables. This section explains the procedure for EFA in this study, including the statistical software, factor extraction method, factor rotation method and the process for checking the factorability of the data and item evaluation.

Statistical software: IBM SPSS 24 statistical software was used to conduct this analysis. After assessing the factorability of the data, the exploratory factor analysis was conducted.

Factor extraction method: As Field (2013) suggests, the Maximum Likelihood (ML) method was used in factor extraction. Tabachnick & Fidell (2013:638) note that the goal of maximum likelihood factor extraction method is to "estimate factor loadings for population that maximise the likelihood of sampling the observed correlation matrix" and is especially useful when further performing confirmatory factor analysis.

Factor rotation method: Between the two main rotation methods; orthogonal and oblique rotation, oblique rotation was selected, since it allows correlations between factors and provide a realistic view of the data (Field, 2013; Tabachnick & Fidell, 2013). Field (2013) explains that orthogonal rotations as inappropriate for any research in social science that involves humans. Among the different types of oblique rotation, Direct Oblimin was selected, as Brown (2009) suggests it is the most appropriate.

Checking the factorability of the data: The suitability of the data for factor analysis was tested by measuring inter-item correlations ensuring that they

exceeded 0.30 (Tabachnick & Fidell, 2013). The corrected item-to-total correlations were also checked to ensure they exceeded the 0.5 accepted level. Further, Bartlett test of sphericity was also conducted to test whether the correlations among variable in the data were different from or equal to zero. "A statistically significant Bartlett's test of sphericity (sig. < .05) indicates that sufficient correlations exist among the variables to proceed" (Hair et al., 2013:103). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO, MSA) was checked to ensure it was greater than 0.5, otherwise it indicates errors in the pattern of correlations and therefore factor analysis is likely to be inappropriate (Hair et al., 2013).

Item evaluation: Factor loadings above 0.4 were initially considered at the EFA level (Stevens, 2002). Item loadings above 0.4, are preferred because loadings lower than that are recognised as very rarely contributing to the significance of any factor (Hair et al., 2013). However, Stevens (2002) states that significance of factor loadings depends on the sample size, and therefore samples over 300 can consider factor loadings over 0.298 as significant.

Eigenvalues indicate the substantive importance of a given factor, and it is reasonable to keep only factors with large eigenvalues (Hair et al., 2013). As Field (2013) suggest, this study allowed extraction of unlimited factors based on eigenvalues greater than 1, without forcing to extract a fixed number of factors.

Item cross loading indicates that some items have correlations with other factors and therefore it was made sure that good factor solutions were provided by EFA with 'pure' variables which indicate high correlations with only one factor (Tabachnick & Fidell, 2013). Higher communalities were ensured because they indicate that a "large amount of the variance in a variable has been extracted by the factor solution" (Hair et al., 2013:134). However, there are no statistical guidelines to determine the cut-offs for communalities, and 0.5 was recognised as a suitable lower level (Hair et al., 2013). Reliability at the EFA level was checked using Cronbach's alpha, ensuring above 0.7 or even 0.6 for exploratory research (Hair et al., 2013).

4.4.2 Confirmatory Factor Analysis

Using the EFA findings in each stage, CFA models were developed separately, and each examined for validity, reliability, and model fit.

Statistical software: This study used AMOS version 24 which is an extension of SPSS that provides co-variance based analysis in SEM (Arbuckle, 2016). Hair et al. (2013:570) recommend using 'co-variance-based SEM' whenever possible since covariance matrices provide more flexibility in analysis. Since AMOS is the licenced version used in the Hull University Business School, and further the researcher is familiar with it, this study used it in the main data analysis.

Estimation method: Maximum likelihood estimation (MLE) is the most frequently used estimation technique and the default in AMOS. However, addressing the multivariate nonnormality of data, this study continued with bootstrap ML estimation for 1000 sample size. Hair et al. (2013) note that MLE is a robust approach to conditions that violate the normality assumptions.

Model evaluation with fit indices: After specifying the model, model fit indices were used to compare the theory with reality. Hair et al. (2013) note that index cut-off values should be adjusted to model characteristics since many of the fit indices can be achieved by compromising the sample size. They proposed different sets of cut-offs based on the sample size and model complexity. This study uses the values suggested by Hair et al. (2013), especially for studies with a sample size more than 250 and more than 30 variables , both of which apply to this study (see table 3.14, methodology chapter).

Table 4. 3: Cut-off values for model fit indices considered for this study

Model fit indices	**Cut-off Value**
Chi- Square (χ^2)	Significant p values are expected.
Root mean square error of approximation (RMSEA)	<.07 with CFI of .90 or higher
Standardized root mean residual (SRMR)	0.8 or less (with CFI above .92)
Comparative fit index (CFI) or/ Tucker Lewis Index (TLI)	Above .90

Source: Hair et al. (2013:584)

Model diagnostics for modifications: Possible modifications were mainly detected by investigating parameter estimates, modification indices and standardised residuals (Byrne, 2016). Tabachnick & Fidell (2013) note that modifications are essential to improve the model fit, especially in exploratory work. As Byrne (2016:84) explains, the "initial step in the assessing the individual parameters in the model is the viability of their estimated values". As Hair et al. (2013) suggest, all the parameter estimates were checked for correct size, ensuring the majority is over 0.7 or few over 0.5. Further, the Critical Ratios (CR) were checked whether more than ± 1.96 and significant at the 0.001 level. The error variances were checked to recognise whether there were any negative values (negative error variance), resulting in Heywood cases.

As Hair et al. (2013) suggest, the standardised residuals were checked to identify any value exceeds 4.0 or above 2.5. The actions were taken to remove the items if standardised residuals exceeded 4.0 and when the values exceeded 2.5, a special attention was given to making sure that they were not associated with any other concurrent problems. If they were associated with any other problems, those items also were removed from the model. Modification indices (MI) reflects 'the extent to which the hypothesised model is appropriately described', and typically MI values less than 10.00 will not make any significant improvement to the overall model fit (Byrne, 2016:103). Modifications were carried out on an iterative basis, where very poor items were addressed as the top priority, without making any harm to the theory (Hair et al., 2013).

Assessing the measurement model validity: Hair et al. (2013) note that measurement model validity is mainly ensured by maintaining an acceptable level of Goodness of Fit (GOF) and confirming the construct validity. Construct validity is mainly ensured by convergent validity and discriminant validity. As Hair et al. (2013) suggest, the convergent validity of this study was guaranteed by ensuring, factor loadings over .5 or better .7, with no standardised estimates over ± 1.0, item commonality >.5, average variance extracted >.5, construct reliability >.7 and cronbach alpha values >.7. Discriminant validity was measured by comparing the Average Variance Extracted (AVE) values for any two constructs with the square of the correlation estimate between these two constructs and ensured that AVEs are greater than the squared correlation estimate (Hair et al., 2013). Further item cross-loadings and inter-construct error covariances were not allowed, to ensure the discriminant validity.

Finally, all validated measurement models were combined to develop the final overall measurement model. This model was also tested for validity, reliability and model fits. The necessary improvements were made to the final model to ensure the appropriate model fit.

4.4.3 Developing the structural model

After satisfying all the conditions in the measurement model, the structural model was developed specifying the relationships among the constructs under investigation. The structural model was also tested for model fit, validity and assessment of structural relationship parameters. As Hair et al. (2013) note, χ^2 GOF for structural model is typically higher than the measurement model since relationships between some constructs are assumed to be 0. The model fit of the structural model was ensured with χ^2 value and some absolute and incremental fit indices. Further, standardised residuals, parameter estimates, and modification indices were checked to recognise possible problems and further improvements to the model. Finally, the hypotheses were tested and conclusions were obtained based on the final structural model.

4.5 Understanding the customer value co-creation intention in self-service technologies

After cleaning the data and checking for multivariate assumptions, the first Exploratory Factor Analysis was conducted to understand the factors that influence customer value co-creation intention in self-service technologies. 45 items which emerged from the qualitative interviews were re-investigated in the quantitative stage of data collection and examined in EFA.

4.5.1 Exploratory Factor Analysis of co-creation intention

As Tabachnick & Fidell (2013) suggest, the factorability of the data was initially tested by evaluating inter item-correlations, which confirmed that most of the correlations exceeded 0.3 and all less than 0.8 (annexure xi). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) value of 0.935 indicated that factor analysis is appropriate for these data, and the sample size (411) in this study satisfied the requirement of EFA (Hinkin, 1998; DeVellis, 2003; Field, 2013; Tabachnick & Fidell, 2013). Bartlett's test of sphericity was significant at the 0.001 level with Chi-Square = 14088.176 and *df* =990. (Hair et al., 2013:102).

Table 4. 4: KMO statistics and Bartlett's test of sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.935
Bartlett's Test of Sphericity	Approx. Chi-Square	14088.176
	df	990
	Sig.	.000

After checking the factorability of the data with above steps, EFA was conducted. Nine factors with eigenvalues >1 were extracted by the EFA, which cumulatively explain 65.23% of the total variance. The factor loadings showed the existence of salient factors without any cross loadings, confirming the unidimensionality of the scales. The rotated factor solution provided a simplified structure with all significant factor loadings over 0.4 while the majority were 0.7. Fifteen items were excluded by the analysis since their loadings were less than 0.40. All the communalities were higher than 0.5, showing that a "large amount of the variance in a variable has been extracted by the factor solution" except in two items (SIFA4, PERJ4) (Hair et al., 2013:134). The reliability and internal consistency

of the findings were checked with item to total correlations and Cronbach's alpha values. All the item to total correlations were greater than 0.5. All the Cronbach alpha values were above the accepted range (0.7 and 0.6 can be used in exploratory research) (Hair et al., 2013:125) (Annexure xii). A summary of exploratory factor analysis is provided in annexure xiii.

Although the qualitative research findings suggested on eight-factor solution, EFA suggested nine factors, which were similar to the themes identified in the qualitative study. Factors one to seven contained items which were logically related to the findings of the categorisation in the qualitative study and the related literature. However, the eighth and ninth factors contained a mix of items and it was decided to further consider in the confirmatory factor analysis. Factors 1,2,3,4,6 and 7 exactly represented the qualitative research findings, and therefore these factors were named as in the qualitative study, as performance, technology know-how, social influence, information richness, situation factors and convenience. Two items which were recognised under the factor 2 in the qualitative study were detached from it and located as a separate factor in factor 5. Factors 8 and 9 were a mix of items mainly from 'personal judgements' and 'emotional reactions' while still these themes were represented by the majority of the items. The findings of the exploratory factor analysis were used to build the measurement model in confirmatory factor analysis.

4.5.2 Confirmatory Factor Analysis of co-creation intention

As Byrne (2016) notes, one of the preliminary objectives of CFA is to refine the model developed with EFA. Therefore, after specifying the latent structure with relationships between observed and latent variables through the EFA, a CFA was conducted.

There were 595 distinct sample movements and 113 distinct parameters to be estimated, leaving 482 degrees of freedom based on an over identified model. Cut off values for model fit indices were taken from Hair et al. (2013:584), those were particularly applicable to this study (the sample size over 250 and 30 variables). The χ^2 (482) = 1397.875 $p<0.001$ indicated a problem in model fit, which is to be expected with large samples. GFI= 0.820, RMSEA=0.068 (90% confidence intervals of 0.064 and 0.072). RMR and SRMR were respectively 0.063 and 0.060 while CFI =.908 and TLI=.893. Fit indices in the initial model indicated room for improvement.

Assessing the measurement model validity: Hair et al. (2013) note that the validity of the measurement model mainly depends on maintaining acceptable level of Goodness of Fit (GOF) and ensuring the construct validity. The convergent validity was ensured by checking factor loadings, squared multiple correlations, average variance extracted, reliability etc.

Byrne (2016:84) notes that "an initial step in the assessing the individual parameters in the model is the viability of their estimated values". All the parameter estimates in this model displayed the correct size and the sign. Most of the items had standardised regression weights over 0.7, except only in four items (annexure xiv). Parameter estimates below 0.7 represented by 'simplicity' (0.69) 'PERJ4' (0.620), 'SOIN3' (0.54) and 'SIFA4' (0.40). All the Critical Ratios (CR) were > ± 1.96 and significant at the 0.001 level. Further, there were no negative error variances or standardised estimates over ±1. Most of the squared multiple correlations were also over the 0.5 cut-off value except in the above identified four variables. These factors were further cross-checked with other validity measures.

Convergent validity was further ensured through maintaining above 0.05 Average Variance Extracted (AVE) and greater than 0.07 Construct Reliabilities (Hair et al., 2013). There were no factor cross loadings or between construct error co-variance in the model. However, a convergent validity issue was found in factor six (situational factors) (AVE=.482). Therefore, the item with the lowest regression weight (SIFA 4=0.402) was decided to eliminate, which caused to improve the AVE to .632

Issues of discriminant validity were found between factor two and factor five, and further, they were highly correlated with each other (co-variance 0.81). Apart from that, factor five consisted of only two items, and in line with the qualitative research findings, some conceptual similarities with factor two were detected. Therefore, it was decided to combine these two factors to solve the problem. Another discriminant validity issue was found between factor eight (emotional reactions) (AVE=.555 < MSV=.590) and factor nine (personal judgements) (AVE.502 < MSV=.590). After carefully evaluating each item in these factors, it was decided to combine them, considering their conceptual similarities. After that, a convergent validity issue arose in the newly combined factor and therefore two items (PERJ4 and PERF7) with lower regression weights (0.51 and 0.64) were deleted. After addressing these issues, the model's construct validity was ensured

by achieving above 0.7 construct reliabilities and greater than 0.5 AVEs. Ensuring the fullfilment of discriminant validity, all the average variance extracted estimates were greater than the squared correlation estimate, indicating that the particular latent construct explained more of the variance than that it shared with another construct. The following table summarises the model validity.

Table 4. 5: Validity measures of the model

	CR	AVE	MSV	MaxR(H)	Emo	Perf	Teck	Soin	info	Situ	conv	Inte
Emo	0.828	0.548	0.494	0.837	**0.740**							
Perf	0.897	0.743	0.624	0.937	0.668	**0.862**						
Teck	0.912	0.634	0.569	0.962	0.703	0.432	**0.796**					
Soin	0.792	0.579	0.182	0.974	0.427	0.284	0.240	**0.760**				
Info	0.907	0.623	0.432	0.980	0.609	0.657	0.458	0.283	**0.789**			
Situ	0.774	0.632	0.469	0.982	0.676	0.629	0.589	0.350	0.504	**0.794**		
Conv	0.844	0.644	0.624	0.983	0.702	0.790	0.677	0.297	0.621	0.685	**0.802**	
Inte	0.926	0.807	0.569	0.986	0.676	0.608	0.754	0.300	0.508	0.647	0.610	**0.898**

N.B- Emo-Emotional reactions, Perf-Performance, Teck- technology-know-how, Soin-Social influence, Situ-Situational factors, Conv-Convenience, Inte-co-creation intention

Nomological validity was ensured by checking the Pearson correlations among the constructs. All the correlations indicated the presence of the expected sizes and directions, confirming the nomological validity (annexure xi).

After meeting these all conditions, it was decided to keep this model at this stage, since it would be tested again when developing the final overall measurement model and the structural model for hypothesis testing.

Model respecifications (modifications): Although some of the fit indices of the initial model were in the accepted range, room for improvement was recognised. These possible modifications were mainly detected by investigating parameter estimates, modification indices and standardised residuals (Byrne, 2016).

Parameter estimates: As noted in the above section, there were four items found in the initial model with low parameter estimates, (simplicity, PERJ4, SOIN3 and SIFA4). Among them, SIFA4 and PERJ4 were eliminated since these items were incorporated with another convergent validity issue (see above section). However, still SOIN3's contribution stayed below 0.7, and if SOIN3 had been removed from the model, it would

have reduced the 'social influence' factor to two items, and at the same time caused a Heywood case (over 1.0 parameter estimate for SOIN2). Therefore, it was decided to keep SOIN 3 in the model.

Standardized residuals**:** As Hair et al. (2013) describe, no any standardised residuals should exceed 4.0 and standardised residuals above 2.5 need attention to make sure that they are not associated with any other problems. In this model, there were two standardised residuals greater than 4 in covariance between 'simplicity and clarity' (4.523) and 'simplicity and sufficiency' (4.631). Therefore, 'simplicity' was eliminated in this stage, since it was linked with low parameter estimates. After addressing that, all the standardised parameter estimates appeared to be in the acceptable range and the largest standardised residual was found for the covariance between SOIN3 and BEIN1 at 3.879, which was still below 4. When these items were crosschecked with the loading estimates, it was found that SOIN3 is having a lower loading (0.547). As Hair et al. (2013:635) suggest, since the residual did not exceed 4.00 and eliminating that item would have created another issue (reducing the factor to two items and creating a Heywood case), no action was taken at this level.

Modification indices**:** Modification indices reflect "the extent to which the hypothesised model is appropriately described", and typically MI values less than 10.00 will not make any significant improvement to the overall model fit (Byrne, 2016:103). The following modifications were made on an iterative basis where very poor items were addressed as the top priority (Hair et al., 2013). According to that, the error covariances between the following items were connected sequentially to improve the model fit. Linking the covariance between e10< - > e11= (MI 106.161, PCS 0.206) reduced χ^2 from 1124.312 (349) to 1000.851 (348). Similarly e18 <- -> e19 = (MI=58.461 PCS=0.146) reduced χ^2 to 937.410, e7 <- -> e6 = (MI 32.494, PCS 0.143) reduced χ^2 to 840.917, e17 <- -> e18= MI 19.483, PCS 0.059) reduced χ^2 into 818.485 and finally, e5 <- ->e6 = (MI 18.078, PCS 0.049) reduced the χ^2 to 797.292. All the modifications were made connecting error covariances within the same construct, without causing any harm to the theory.

Model fit indices in the final co-creation intention model: The following table summarises the fit indices related to the customer value co-creation intention model. The

χ^2 (344) = 797.292 at p< 0.001 and normed chi-square is 2.318 which is below 3, the accepted value. The RMSEA=0.057, RMR=0.049 and SRMR =0.049 also in the acceptable range. Referring to the incremental fit indices, the NFI=.914, TLI =.940, CFI =.949 and IFI is .950 also evidenced the model validity.

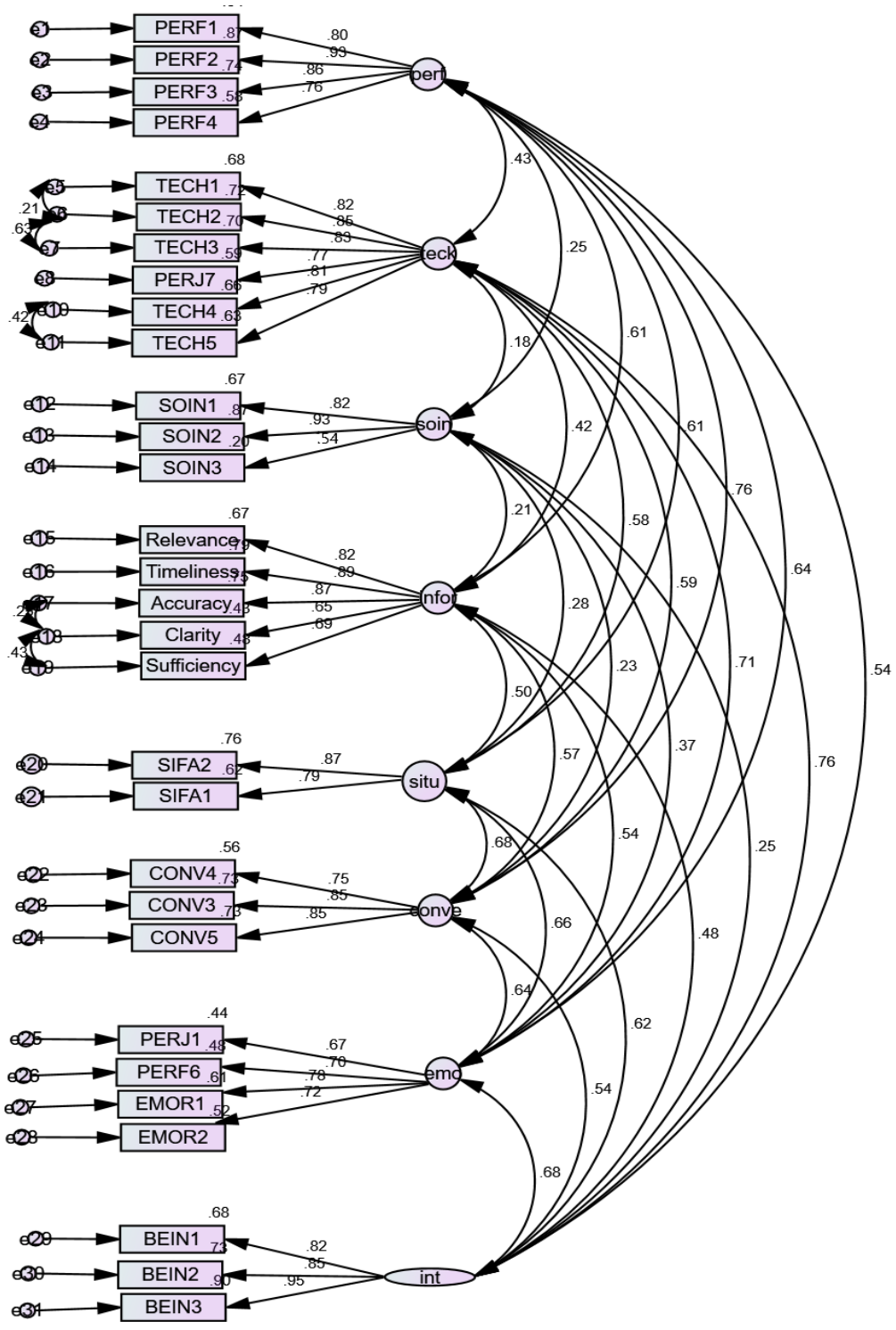
Table 4. 6: Fit indices in the customer value co-creation intention model

Model fit Indices	**Cut-off Value**	**Fit Indices**
Chi- Square (x^2)		
Chi- Square (x^2)		797.344
Degrees of freedom		344
Probability		0.000
Normed chi-square	< 3	2.318
Absolute fit measures		
Root mean square error of approximation (RMSEA)	<0.07	0.057
90 percent confidence interval for RMSEA		0.052-.062
PCLOSE		0.017
Root mean square residual (RMR)		0.049
Standardized root mean residual (SRMR)	<0.08	0.0498
Incremental Fit Index (IFI)	>0.9	
Normed Fit index (NFI)		0.914
Tucker Lewis Index (TLI)		0.940
Comparative Fit Index (CFI)		0.949
Incremental fit index (IFI)		0.950
Parsimony fit index (PGFI)	<0.7	
Parsimony normed fit index (PNFI)		0.775
Parsimony goodness of fit index (PGFI)		0.694

Adapted from Hair et al. (2013:630)

The following figure illustrates the final measurement model in understanding customer value co-creation intention in SSTs.

Figure 4. 1: CFA model for customer value co-creation intention in SSTs



4.6 Understanding the customer value co-creation practices in self-service technologies

Sixteen customer value co-creation practices in self-service technologies, which were recognised in the qualitative interviews, were reinvestigated in the quantitative stage and tested using exploratory and confirmatory factor analysis.

4.6.1 Exploratory Factor Analysis of co-creation practices

Separate exploratory factor analysis was conducted to identify the customer value co-creation practices in self-service technologies. Aligning with the previous exploratory factor analysis, maximum likelihood method was used for factor extraction, and oblique rotations, specifically the direct oblimin was used in factor rotation. Item loadings were constrained to above 0.5, allowing extraction of unlimited factors which were with eigen values >1 (Hair et al., 2013).

Twelve items were loaded on to two factors, while four items were excluded since the loadings were less than 0.5. Nine items were loaded on to the first factor, and only three items were loaded on to the second factor, without any factor cross loadings. These cumulatively explained 58.15% of the variance. (annexure xv). The values of item-to-total correlation were over 0.5. (annexure xvii). The reliability was checked with Cronbach's alpha, and the value for the first factor was 0.908, while that for the second factor was .794. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.916. Bartlett test of sphericity was significant at the 0.001 level with approx. Chi-Square = 3813.684 and df =136 (annexure xvi). This EFA suggestion was used in CFA to develop the final model.

4.6.2 Confirmatory Factor Analysis of co-creation practices

Based on the EFA suggestion, the basic CFA measurement model was developed. There were 78 distinct sample movements and 29 distinct parameters to be estimated, leaving 53 degrees of freedom based on an over identified model, and a chi-square value of 275.289 with 0.001 probability level. All the parameter estimates were over 0.5 while the majority were over 0.7, and standardised regression weights were no more than ±1.00 (annexure xviii). All the Critical Ratios (CR) were > ± 1.96 and significant at the 0.001 level, and there were no negative error variances. The initial model shows χ^2 (53) =

275.289 with $p<0.05$. The values of GFI=0.896, RMSEA=0.101, RMR= 0.054, SRMR=0.0589, CFI=.910. and IFI=.910 showed a requirement for further improvements.

As Hair et al. (2013) suggest, the model identification started with examining parameter estimates. As noted above, all the factor loadings were significant at the 0.001 level and higher than 0.5 while the majority were over 0.7. The parameter estimates which below 0.7 were CORE1 (0.67) and COLE1 (0.67) (annexure xviii) However removing CORE1 from the model, would limited 'factor 2' to two items. Further, a high co-variance (0.73) was found between the two constructs. Solving these issues and further with the aim of reducing the model complexity and achieving convenience of handling data, the research sought to obtain all co-creation practices together as a common factor of 'customer value co-creation practices'. Following that, another exploratory factor analysis was run to explore how items would be loaded if the number of factors to be extracted was constrained to one, and it was recognised that the same items were loaded onto a single factor.

As Hair et al. (2013) suggest, convergent validity was ensured by checking factor loadings, average variance extracted, reliability etc. All the factor loadings were significant at the 0.001 level and higher than 0.5 while the majority were over 0.7. However, Average Variance Extracted (AVE) indicated 0.456 which was less than the cut off value (0.05) (Hair et al., 2013). Since AVE indicated a problem with construct validity, it was decided to consider the items with low parameter estimates carefully. Among them, the items with lower regression weights were cut down sequentially comparing with the improvement of AVE. Eliminating CONE1 (standardised regression weight=0.50) improved AVE to 0.473, eliminating CONE2 (standardised regression weight=0.52) increased AVE to 0.493 and removing CORE1 (standardised regression weight =0.55) improved AVE to 0.514 which is over the accepted cut-off level of 0.5. The Cronbatch's alpha value was found to be 0.903.The model was not tested for discriminant validity, since it consisted of a single factor.

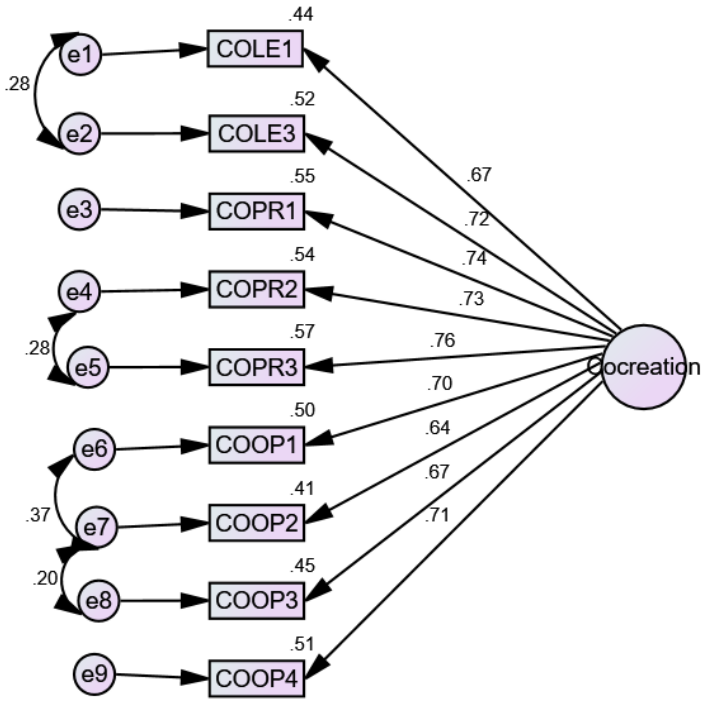
This model was checked for the model fit, revealing further room for improvement. Possible modifications to the model were mainly detected by investigating modification indices and standardised residuals (Byrne, 2016). All the values of standardised residuals were below 2.5 and parameter estimates were in the accepted range (the majority over 0.7). Therefore, the following modifications were accompanied by addressing

modification indices. Connecting error covariances of e6<- -> e7 = (MI=46.770, PC=0.148) reduce χ^2 from 198.759 to 148.894. Similarly, connecting error covariance between e1 <- ->e2 (MI= 30.959, PC= 0.122) caused to χ^2 reduce to 115.638, e4<- -> e5= (MI=19.642, PC= 0.099) reduced the χ^2 to 92.168 and e7<- -> e8= (MI=14.495, PC= 0.089) reduced the χ^2 to 76.518. After addressing these modifications, the model achieved many of the fit indices. The following table provides the model fit indices of the value co-creation practices model.

Table 4. 7: Fit indices in the value co-creation practices model

Model fit Indices	**Cut-off Value**	**Fit indices**
Chi- Square (χ^2)		
Chi- Square (χ^2)		76.518
Degrees of freedom		23
Normed chi square	< 3	3.327
Absolute fit measures		
Goodness of Fit Index (GFI)	>0.90	0.961
Root mean square error of approximation (RMSEA)	<0.07	0.065
90 percent confidence interval for RMSEA		0.057-0.084
Root mean square residual (RMR)		0.030
Standardized root mean residual (SRMR)	<0.08	0.0411
Incremental Fit Index (IFI)	>0.9	
Normed fit index (NFI)		0.960
Comparative fit index (CFI)		0.971
Relative fit index (RFI)		0.937
Tucker Lewis Index (TLI)		0.955
Parsimony fit index (PGFI)	<0.7	
Parsimony normed fit index (PNFI)		0.613
Parsimony goodness of fit index (PGFI)		0.491

Figure 4. 2: CFA model for customer value co-creation practices



4.7 Understanding customer value co-destructions in self-service technologies

Consistent with Echeverri & Skalen (2011), this study acknowledges the duality of value practices as co-creation and co-destruction. Accordingly, the sixteen items which were recognised in the qualitative study as co-destructions were surveyed in the quantitative stage and tested by EFA and CFA.

4.7.1 Exploratory Factor Analysis of value co-destruction

The sixteen items of value co-destruction were tested by EFA, constraining factor extraction to 0.5. Two factors were identified, allocating eight items to factor one and two items to factor two. CDCO1 cross loaded to both factors as 0.596 to factor one and 0.317 to factor two. Seven items were dropped since they did not achieve the required factor loadings. These two factors cumulatively explained 58.155 % of the variance (annexure xix). The KMO value was .844 and Bartlett's test of sphericity was significant at chi-square 2620.03 with df=105 and $p<0.001$ (annexure xx). Cronbach's alpha value was .845, and all the item to-total correlations were above 0.5 (annexure xxi).

4.7.2 Confirmatory Factor Analysis of value co-destruction

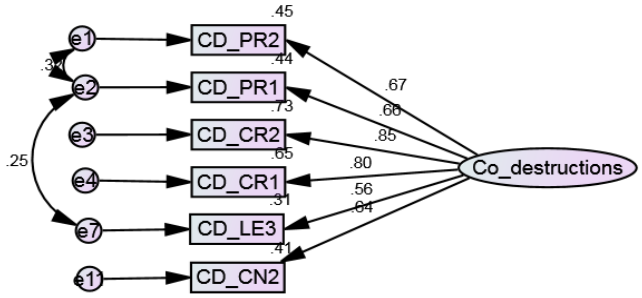
The EFA findings were used to build the CFA model. Since the research aims to understand co-destructions together as a unified common factor, and further only two items were loaded to factor two, it was decided to combine these two factors and continue with the CFA. The following items were cut down due to low regression weights; CDCD4 (0.19), CDCO1 (0.365), CDCO2 (0.419) and CDPR3 (0.471). After these changes, the model shows χ^2= 68.059 with df= 9 and $p<0.05$. However, some of the model fit indices did not reach acceptable values. RMSEA=0.127 (with 0.99 and 0.155 of 90% confidence intervals), RMR=0.087, SRMR= 0.063, GFI=.945, CFI=.944. Therefore, the standardised residuals and modification indices were checked to identify the possible improvements to the model. All the standardised residuals were in the acceptable range (less than ± 2.5) ranging from – 0.683 to -1.161 and 0.054 to 0.928. The modification indices indicated some possible improvements and therefore, connecting the error covariances between e1<- -> e2= (MI=25.436, PC=.281) caused χ^2 to reduce to 37.316 and e2 <- -> e7= (MI=25.813, PC= 0.275) reduced χ^2 to 10.195, resulting in improvement in the model fit. The model fit indices, after these amendments are shown in the following table.

Table 4. 8: Fit indices in the value co-destruction model

Model fit Indices	Cut-off Value	Fit indices
Chi- Square (χ^2)		
Chi- Square (χ^2)		10.195
Degrees of freedom		7
Normed chi square	< 3	1.456
P value		0.178
Absolute fit measures		
Goodness of Fit Index (GFI)	>0.90	0.992
Root mean square error of approximation (RMSEA)	<0.07	0.033
90 percent confidence interval for RMSEA		0.000-0.074
PCLOSE		0.699
Root mean square residual (RMR)	<0.08	0.035
Standardized root mean residual (SRMR)		0.0177
Incremental Fit Index (IFI)	>0.9	
Normed fit index (NFI)		0.990
Comparative fit index (CFI)		0.997
Incremental fit index (IFI)		0.997
Tucker Lewis Index (TLI)		0.993
Parsimony fit index (PFI)	<0.7	
Parsimony normed fit index (PNFI)		0.462
Parsimony goodness of fit index (PGFI)		0.331

The following figure shows the measurement model to understand customer value co-destructions in self-service technologies.

Figure 4. 3: CFA model for customer value co-destructions



The convergent validity of the model was ensured by checking factor loadings, average variance extracted, reliability etc. All the factor loadings were significant at the 0.001 level and higher than 0.05 (annexure xxii). Average Variance Extracted (AVE) was 0.503 and the Cronbach's alpha value was 0.845.

4.8 Understanding customer value co-creation experience in self-service technologies

Eleven items which explain functional and emotional experiences of customers were tested by EFA, constraining extraction to above the 0.5 level.

4.8.1 Exploratory Factor Analysis of co-creation experience

Three factors were identified, with four items each allocated to the first and second factors and three items for the third factor. Considering the conceptual similarities, these factors were named as functional experiences, positive emotional experiences and negative emotional experiences. All the eigenvalues of these factors were > 1 and 4.922, 1.823 and 1.315 respectively for each factor. All three factors cumulatively explained 73.279 of the total variance. All the communalities were higher than 0.5 except one item (FUNE1) as shown in annexure xxiii. The values of Cronbach's alpha were in the acceptable range and 0.862, 0.908, 0.808 respectively for these factors. Further, item-to total correlations also were over 0.5 (annexure xxv). The KMO measure of sample adequacy was 0.824 and Bartlett's test was significant at the 0.001 level (χ^2=2649.644, df= 55) (annexure xxiv). The EFA suggestion is provided in annexure xxiii.

4.8.2 Confirmatory Factor Analysis of co-creation experience

Based on the EFA suggestion, the basic measurement model was developed. There were 66 distinct sample movements and 25 distinct parameters to be estimated, leaving 49 degrees of freedom based on an over-identified model, and a chi-square value of 374.351 with a 0.001 probability level.

Most of the parameter estimates had standardised regression weights over 0.7, except FUNC1=0.578, EMEX4=.586 and EMEX3= 0.672. No standardised parameter estimates were more than ±1.00. All the Critical Ratios were > ± 1.96 and significant at 0.001 level (annexure xxvi). The model fit indices related to the initial model were as χ^2=138.068 with df=24, RMSEA=.108 (with .091-.125 of 90% confidence interval), RMR =0.094, SRMR= 0.062, CFI=946, and TLI=.919. Since there was a necessity of improving the model, the standardised residuals were checked to identify the opportunities.

There was only one standardised residual higher than 2.5 in between EMEX 4 and EMEX7 which was 3.487. When comparing these items, it was found that EMEX 4 had

a smaller standardised regression (0.586) and low squared multiple correlation (0.343). Therefore, it was decided to eliminate EMEX4 from the model. After that, the standardised residuals were checked again, and the next highest standardised residual was found in between FUNE1 and EMEX2 as 2.918. Since FUNE 1 was found to have another issue with low regression weight (0.58), it was decided to eliminate it from the model. Further improving the model, connecting the error covariances between E7<- -> e11 = (MI=29.139, PC=.322) caused to reduce χ^2 to 107.220 and E7<- -> e5 (MI=13.794, PCA= 0.136) reduced χ^2 to 79.116.

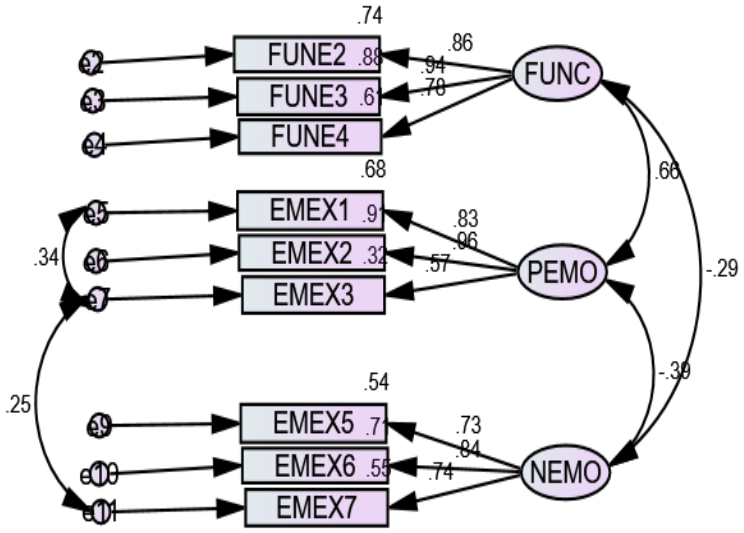
Improved fit indices indicate, RMSEA=0.080, RMR and SRMR 0.073 and 0.050 respectively, TLI= 0.955 and CFI =0.973. The fit indices of the 'customer value co-creation experience' model are given in the following table.

Table 4. 9: Fit indices in the customer value co-creation experience model

Model fit Indices	**Cut-off Value**	**Fit indices**
Absolute Measures		
Chi- Square (χ^2)		79.716
Degrees of freedom		22
Probability		0.000
Normed chi square		3.623
Goodness of Fit Index (GFI)	>0.90	0.961
Root mean square error of approximation (RMSEA)	<0.07	0.080
90 percent confidence interval for RMSEA		0.062-0.089
PCLOSE		0.005
Root mean square residual (RMR)		0.073
Standardized root mean residual	<0.08	0.0505
Incremental Fit Measures		
Normed fit index (NFI)		0.963
Comparative fit index (CFI)	>0.9	0.973
Tucker Lewis Index (TLI)	>0.9	0.955
Relative fit index (RFI)	>0.9	0.939
Incremental fit index (IFI)		0.973
Parsimony fit index (PGFI)	<0.7	
Parsimony goodness-of-fit index (PGFI)		0.470
Parsimony normed fit index (PNFI)		0.588

The following figure shows the measurement model to understand customer value co-creation experiences in self-service technologies.

Figure 4. 4: The CFA model for customer value co-creation experience in SSTs



4.9 Developing the final overall measurement model to understand customer value co-creation intention, practices and experiences in self-service technologies

The final model attempts to carefully combine the four measurement models developed in previous stages. When combining these models, the basic structures were taken without the improvements made by addressing modification indices. Apart from that, one single item construct; 'past experience' was added to the final model at this stage. The full measurement model was treated as a new model and again tested for model fit, validity, and reliability.

4.9.1 Assessing the measurement model validity

The measurement model validity was ensured through " 1) establishing acceptable levels of goodness of fit for the measurement model and 2) finding specific evidence on construct validity" (Hair et al., 2013:576).

4.9.1.1 Model fit in the initial stage of the final model (before modifications)

The results revealed that the chi-square statistic was 2816.338 with 1147 degrees of freedom and significant at the 0.001 probability level, indicating significant differences between the observed covariance matrix and estimated covariance matrix. However, having significant chi value is an inherent problem with large sample sizes and therefore dependence on P value is less meaningful.

Therefore, a number of fit indices were used to measure the goodness of fit. In the initial measurement model, the normed chi square was 2.45 (less than 3) which is acceptable. The RMSEA was 0.059 (less than 0.7) with 0.056 and 0.062 of 90% confidence intervals. The RMR and SRMR were 0.076 and 0.063 respectively, which is lower than 0.08, the acceptance level. TLI was 0.877 and CFI was 0.889 in the initial model, indicating further improvements.

The model fit indices related to the final model (before any modifications) are shown in the following table (table 4.10). Even though the combined full measurement model was aligned with some of the fit indices, there was a room for further improvement. Therefore, further modifications to the model were required to achieve recommended values of the fit indices.

Table 4. 10: Fit indices in the final model (before modifications)

Model fit Indices	Cut-off Value	Initial model
Absolute Measures		
Chi- Square (x^2)		2816.338
Degrees of freedom		1147
Probability		0.000
Normed chi square	<3	2.455
Root mean square error of approximation (RMSEA)	<0.7	0.059
90 percent confidence interval for RMSEA		0.056-0.062
PCLOSE (RMSEA > 0.07 with CFI 0.9 or Higher)		0.001
Root mean square residual (RMR)		0.076
Standardized root mean residual (SRMR) (<0.08 with CFI above 0.92)	<0.08	0.0636
Incremental Fit Measures		
Comparative fit index (CFI)	>0.9	0.889
Tucker Lewis Index (TLI)		0.877
Incremental fit index (IFI)		0.890
Parsimony fit index (PGFI)		
Parsimony goodness-of-fit index (PGFI)	<0.7	0.675
Parsimony normed fit index (PNFI)		0.744

4.9.1.2 Construct validity of the measure

As Hair et al. (2013) suggest, the construct validity of a measure is assessed by evaluating the face validity, convergent validity, discriminant validity and nomological validity. The face validity of the measurements was ensured through several expert reviews in the questionnaire development stage, and the findings were reported in the methodology chapter (see 3.5.3.1.10: Eliminate problems by pilot testing).

4.9.1.2.1 Convergent validity

Convergent validity was ensured by checking factor loadings, squared multiple correlations, average variance extracted, reliability etc.

All the factor loadings were above 0.5 while the majority were greater than 0.7. All of them were significant at the 0.001 level, and there were no unusual factor loadings such as above 1.0. Squared multiple correlations are known as ‘item reliability, communality,

variance extracted' and represents "extent to which measured variables variance is explained by latent factor". However, squared multiple correlations is a function of standardised factor loading, and therefore it is likely to yield the same diagnostics (Hair et al., 2013:617).

All the Average Variance Extracted were greater than 0.05 (the threshold). The reliability was ensured by measuring Cronbach's alpha and construct reliabilities (CR). All the Cronbach's alpha values and CR values for constructs were in the acceptable range (over 0.7). These values are shown in table 4.11.

Table 4. 11: Convergent validity measures in the final CFA model

Construct	Items	Standard Loadings P<.001	CIs (95%)	SE	AVE	CR	Cronbach's Alpha
Performance	PERF1	.799	.750-.835	.026	.706	.905	.898
	PERF2	.934	.909-.953	.011			
	PERF3	.862	.815-.897	.021			
	PERF4	.758	.699-.805	.026			
Tech Know-how	TECH1	.831	.783-.869	.022	.688	.929	.928
	TECH2	.850	.802-881	.023			
	TECH3	.828	.792-.886	.025			
	PERJ7	.778	.700-.826	.037			
	TECH4	.809	.756-.845	.021			
	TECH5	.774	.704-.825	.030			
Social Influence	SOIN1	.814	.718-.874	.037	.584	.795	.761
	SOIN2	.944	.879-1.031	.037			
	SOIN3	.544	.417-.667	.063			
Convenience	CONV3	.859	.817-.898	.021	.672	.859	.860
	CONV4	.747	.678-.810	.033			
	CONV5	.848	.798-.887	.022			
Situational Factors	SIFA1	.787	.724-.843	.031	.690	.816	.812
	SIFA2	.873	.811-.923	.026			
Information Richness	Relevance	.829	.779-.868	.022	.646	.901	.900
	Timeliness	.878	.832-.912	.019			
	Accuracy	.871	.833-.904	.017			
	Clarity	.661	.585-.723	.034			
	Sufficiency	.690	.629-.742	.030			
Intention	BEIN1	.820	.745-.865	.028	.778	.913	.909
	BEIN2	.853	.712-.937	.055			
	BEIN3	.951	.916-.977	.015			
Co-creation practices	COLE1	.725	.621-.803	.046	.542	.905	.903
	COLE3	.785	.730-.832	.026			
	COPR1	.708	.621-.776	.038			
	COPR2	.684	.593-.756	.040			
	COPR3	.691	.612-.763	.038			
	COOP1	.670	.596-.733	.035			
	COOP2	.632	.550-.703	.041			
	COOP3	.650	.539-.728	.047			

	COOP4	.742	.650-.804	.037			
Co-destructions	CDLE3	.621	.531-.708	.044	.517	.864	.860
	CDPR1	.794	.727-.847	.031			
	CDPR2	.773	.694-.836	.035			
	CDCN2	.576	.474-.659	.045			
	CDCR1	.714	.634-.777	.036			
	CDCR2	.712	.642-.775	.034			
Functional experiences	FUNE2	.875	.835-.906	.018	.744	.897	.889
	FUNE3	.921	.882-.952	.017			
	FUNE4	.787	.724-.839	.029			
Emotional experiences (positive)	EMEX1	.821	.743-.876	.033	.663	.852	.847
	EMEX2	.961	.923-1.004	.021			
	EMEX3	.566	.475-.643	.043			
Emotional experiences (Negative)	EMEX5	.705	.624-.778	.039	.598	.815	.808
	EMEX6	.885	.812-.932	.029			
	EMEX7	.716	.627-.789	.041			
Past experience	Past experience	1.000		-	1.000	1.000	1.000

4.9.1.2.2 Discriminant validity

Discriminant validity denotes whether a construct truly distinct from other constructs. It can be ensured by comparing the AVE values for any two constructs with the square of the correlation estimate between these two constructs, and the AVEs should be greater than the squared correlation estimate, i.e MSV < AVE (Hair et al., 2013).

Although the individual measurement models (which have been shown in the previous steps) had good validity, after combining these pieces into a single comprehensive model, a discriminant validity problem was recognised between the factors, ‘emotional reactions towards SSTs’ and ‘emotional experience’. These two factors were highly correlated with each other (covariance was 0.79) and further represented by higher MSV (0.576) than the AVE (0.515). When reviewing items in peoples ‘emotional reaction towards SSTs’, it was found that EMOR2 (enjoy) was quite similarly represented through their ‘emotional experiences’ EMEX1 (enjoyment). Therefore, it was decided to cut down EMOR2 in ‘emotional reactions’ towards SSTs. After doing so, the model was again tested for validity and it was found a problem still existed, as covariance between factors was 0.77, the MSV was 0.594 and the AVE was 0.485. Further, cutting down one item created a convergent validity problem within the factor ‘emotional reactions towards SSTs’. Additionally, among the three items that remained in this factor, two had parameter estimates below 0.7 (PERJ1= 0.66, PERF6 = 0.68). To resolve these convergent and

discriminant validity issues, finally it was decided to remove the entire ‘emotional reactions’ factor from the model.

After that, all the convergent and discriminant validity issues in the model were resolved and the model indicated a good fit. The following table illustrates the discriminant validity in the model.

Table 4. 12: Discriminant validity measures in the final CFA model

	CR	AVE	MSV	MaxR(H)	PEMO	PEFR	TECH	SOIN	CONV	SITU	INFO	CODE	COCR	FUEX	INTE	NEMO
PEMO	0.852	0.663	0.434	0.896	**0.814**											
PERF	0.905	0.706	0.582	0.955	0.439	**0.840**										
TECH	0.929	0.688	0.542	0.974	0.493	0.420	**0.829**									
SOIN	0.795	0.584	0.081	0.979	0.282	0.246	0.171	**0.764**								
CONV	0.859	0.672	0.582	0.982	0.460	0.763	0.569	0.232	**0.820**							
SITU	0.816	0.690	0.468	0.983	0.486	0.614	0.558	0.284	0.684	**0.830**						
INFO	0.901	0.646	0.449	0.986	0.481	0.597	0.421	0.211	0.569	0.504	**0.804**					
CODE	0.864	0.517	0.194	0.987	-0.110	-0.182	-0.372	-0.217	0.086	-0.135	-0.016	**0.719**				
COCR	0.905	0.542	0.514	0.989	0.606	0.541	0.736	0.180	0.663	0.602	0.616	-0.198	**0.736**			
FUEX	0.897	0.744	0.501	0.990	0.659	0.702	0.450	0.282	0.708	0.669	0.670	0.065	0.657	**0.863**		
INTE	0.913	0.778	0.526	0.991	0.536	0.539	0.725	0.245	0.544	0.632	0.485	-0.188	0.697	0.573	**0.882**	
NEMO	0.815	0.598	0.219	0.991	-0.367	-0.242	-0.468	0.063	-0.276	-0.361	-0.363	0.440	-0.456	-0.268	-0.391	**0.773**

NB: PERF=performance, TECH=technology-know-how, SOIN=social influence, CONV=convenience, SITU=situational factors, INFO=information richness, INTE=co-creation intention, COCR=co-creation, code=co-destruction, FUEX=functional experiences, PEMO= positive emotional experience, NEMO=negative emotional experience

4.9.1.2.3 Nomological validity

Nomological validity ensures that correlations between constructs in a measurement theory make sense (Hair et al., 2013). Therefore, nomological validity was tested by investigating the correlations among the constructs, to understand whether the measurements are meaningful. The outcomes are shown in Table 4.13, below.

As illustrated in table 4.13, all the correlations between factors show the expected kinds of relationships. All the factors (performance, technology know how, convenience, situational factors, information richness) show significant positive correlations with co-creation intention and co-creation practices in self-service technologies. Further, these factors have significant positive relationships with 'functional experiences' and 'positive emotional experience' in self-service technologies. Apart from that, these factors have positive relationships among them. As expected, most of these factors indicate significant negative relationships with 'value co-destructions' and 'negative emotional experiences' in self-service technologies. However, four insignificant relationships were found in the construct correlation matrix.

Table 4. 13: Nomological validity measures in the final CFA model

Construct correlation Metrix												
	PERF	TECH	SOIN	CONV	SITU	INFO	INTE	COCR	CODE	FUEX	PEMO	NEMO
PERF	1											
TECH	.387**	1										
SOIN	.270**	.227**	1									
CONV	.664**	.518**	.243**	1								
SITU	.541**	.487**	.276**	.560**	1							
INFO	.545**	.422**	.230**	.495**	.427**	1						
INTE	.495**	.673**	.283**	.464**	.549**	.441**	1					
COCR	.488**	.690**	.209**	.572**	.509**	.563**	.621**	1				
CODE	-.172**	-.359**	-.130**	.086	-.136**	-.033	-.146**	-.169**	1			
FUEX	.613**	.495**	.282**	.602**	.548**	.612**	.558**	.649**	.017	1		
PEMO	.360**	.448**	.303**	.362**	.378**	.435**	.417**	.499**	-.069	.578**	1	
NEMO	-.252**	-.422**	.007	-.270**	-.316**	-.342**	-.359**	-.411**	.336**	-.298**	-.310**	1

**. Correlation is significant at the 0.01 level (2-tailed).

NB: PERF=performance, TECH=technology-know-how, SOIN=social influence, CONV=convenience, SITU=situational factors, INFO=information richness, INTE=co-creation intention, COCR=co-creation, CODE=co-destruction, FUEX=functional experiences, PEMO= positive emotional experience, NEMO=negative emotional experience

4.9.2 Model diagnostics and modifications to the model

Although most of the fit indices of the initial model were in the acceptable range (see table 4.10), a room for improvement was recognised. These possible modifications were detected by investigating parameter estimates, standardised residuals and modification indices (Byrne, 2016).

4.9.2.1 Parameter estimates

As Byrne (2016) suggest, the model diagnostics started with examining standardised factor loadings. As shown in column three of table 4.11, all the parameter estimates were statistically significant at $p<0.001$, and most of them had standardised regression weights over 0.7. Ten parameter estimates fell below the 0.7 cut-off, but they were above the 0.5 cut-off level. Therefore, it was decided to retain these items in the model to support the content validity, unless they showed evidences of other problems. No standardised parameter estimates were over ±1.00. All the Critical Ratios were greater than ± 1.96 and significant at the 0.001 level. The standardised estimates with respective standard errors and confidence intervals (95%) are provided in the table 4.11.

4.9.2.2 Standardized residuals

As Hair et al. (2013) describe, no standardised residuals should exceed 4.0 and standardised residuals above 2.5 should be paid attention to make sure that they are not associated with any other problems. However, in this model, there were no standardised residuals over 4.0, and there were few standardised residuals which were greater than 2.5. The largest standardised residual was 3.957 for the covariance between SOIN3 and BEIN3. As noted above (developing the measurement model for co-creation intention), deletion of SOIN 3 would reduce the items in the 'social influence' factor to two items and create a Heywood case. Therefore, since the standardised residual did not exceed 4.00 and deletion of the item would cause another issue, no action was taken.

4.9.2.3 Modification indices

Although modifications for the combined model were examined from the beginning, they were quite similar to the modifications addressed for each individual model in the previous steps, and therefore not reported here. All these modifications were made

without making any harm to the theory. These modifications are visually illustrated in the figure 4.5, the final measurement model.

4.9.3 Model fits after the modifications

After addressing the modifications, the χ^2 (1133) =2211.58, was significant at $p<0.001$ indicating a problem in model fit. However, this is not unusual at the given total sample size of 411 (Hair et al., 2013). The normed chi square value was 1.95 (below 3) which is perfectly acceptable.

The RMSEA is a widely used measurement, especially for models with large samples which are rejected by χ^2 GOF tests (Hair et al., 2013). In the final measurement model, RMSEA indicated a very good model fit, being 0.048 (with 0.045 and 0.050 of 90% confidence intervals) and the PCLOSE value of 0.897.

RMR= 0.072 and SRMR= 0.057 also were in the accepted range. The values of CFI and TLI were 0.928 and 0.919 respectively. As Hair et al. (2013) suggest, CFI and TLI values over 0.9 can be accepted when sample size is above 250 and the number of variables are more than 30 ($M \geq 30$). As the overall fit statistics suggest, the estimated model reproduces the sample covariance matrix reasonably well. Further, evidence of construct validity including convergent, discriminant, and nomological validity suggests that the model is valid and provide confidence that measures behave as expected, securing the unidimensionality of measures.

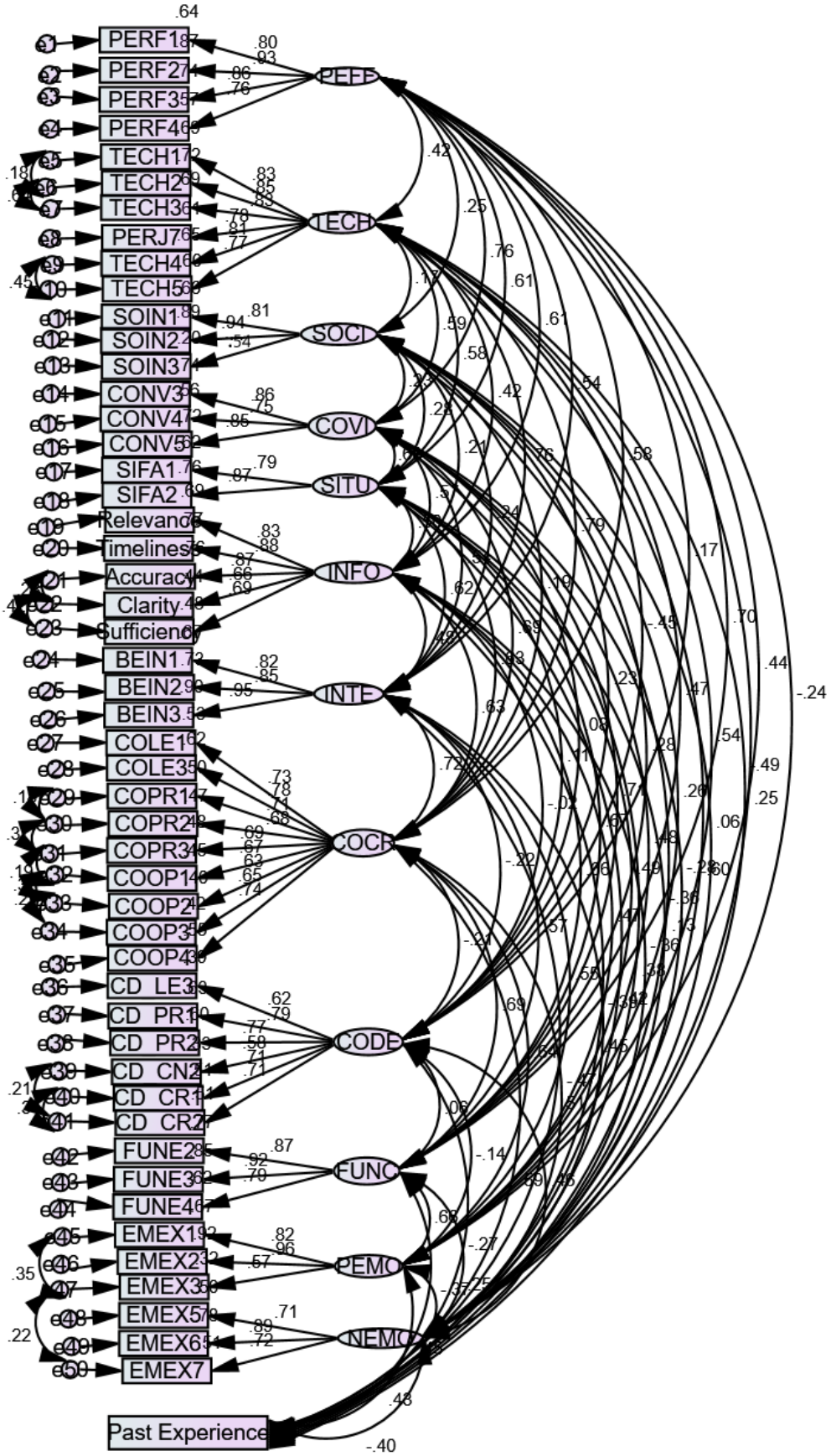
The model fit indices related to the final measurement model are provided in the following table.

Table 4. 14: Fit indices in the final model

Model fit Indices	**Cut-off Value**	**Fit Indices**
Absolute Measures		
Chi- Square (x^2)		2211.589
Degrees of freedom		1133
Probability		0.000
Normed chi square	<3	1.952
Root mean square error of approximation (RMSEA)	<0.07	0.048
90 percent confidence interval for RMSEA		0.045-0.051
PCLOSE (RMSEA > 0.07 with CFI 0.9 or Higher)		0.840
Root mean square residual (RMR)		0.072
Standardized root mean residual (SRMR) (<0.08 with CFI above 0.92)	<0.08	0.057
Incremental Fit Measures		
Comparative fit index (CFI)	>0.9	0.928
Tucker Lewis Index (TLI)		0.919
Incremental fit index (IFI)		0.929
Parsimony fit index (PGFI)		
Parsimony goodness-of-fit index (PGFI)	<0.7	0.703
Parsimony normed fit index (PNFI)		0.668

The final measurement model is provided below, visualising standardised regression weights, squared multiple correlations, covariances between constructs and error covariance.

Figure 4. 5: Final measurement model



4.9.4 Common Method Bias (CMB) in the final measure

The common method variance test was conducted using two approaches namely, Harman's single factor test and Common Latent Factor (CLF) test, to recognise whether the observed correlations among variables were due to common method bias.

4.9.4.1 Harman's single factor test

Harman's single factor test examines whether most of the variance is explained by a single factor (Chang et al., 2010). According to this test, the total variance explained by a single variable is 26.716% which is less than 50%. Therefore, it suggests that data are free from common method variance bias.

Table 4. 15: Total variance explained by a single factor

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	26.449	26.716	26.716	26.449	26.716	26.716
2	8.616	8.703	35.420			
3	4.705	4.753	40.172			
4	3.276	3.309	43.481			
5	2.966	2.996	46.476			
6	2.414	2.438	48.915			
7	2.242	2.264	51.179			
8	2.076	2.096	53.276			
9	1.823	1.841	55.117			
10	1.601	1.617	56.734			

4.9.4.2 Common Latent Factor

This method is used to capture the common variance among all observed variables in the model. According to this, first a latent factor was added to CFA model and then the standardised regression weights in the models with and without the common latent factor was compared (see table 4.16). As Hair et al. (2013) suggest, if these differences are greater than 0.2, these items have been affected by common method bias. According to the findings, only two items in this model (PERJ7, and TECH4) were affected by common method bias.

Table 4. 16: Testing CMB with Common latent factor

Construct	Items	Standard Loadings (P< 0.001) Without CLF	Standard Loadings (P< 0.001) With CLF	Difference
Performance	PERF1	.799	.700	.099
	PERF2	.934	.863	.071
	PERF3	.862	.823	.039
	PERF4	.758	.734	.024
Tech Know-how	TECH1	.835	.662	.176
	TECH2	.918	.880	.038
	TECH3	.893	.877	.016
	PERJ7	.740	.489	.251
	TECH4	.805	.521	.284
	TECH5	.770	.656	.114
Social Influence	SOIN1	.815	.822	-.007
	SOIN2	.941	.934	.007
	SOIN3	.544	.445	.099
Convenience	CONV3	.859	.750	.109
	CONV4	.746	.673	.073
	CONV5	.848	.809	.039
Situational Factors	SIFA1	.788	.748	.040
	SIFA2	.870	.806	.064
Information Richness	Relevance	.812	.798	.014
	Timeliness	.855	.848	.007
	Accuracy	.886	.855	.031
	Clarity	.729	.637	.092
	Sufficiency	.725	.654	.071
Intention	BEIN1	.820	.686	.134
	BEIN2	.853	.740	.113
	BEIN3	.951	.790	.161
Co-creation practices	COLE1	.704	.577	.127
	COLE3	.759	.608	.151
	COPR1	.727	.601	.126
	COPR2	.728	.692	.036
	COPR3	.745	.726	.019
	COOP1	.709	.703	.006
	COOP2	.679	.610	.069
	COOP3	.670	.548	.122
	COOP4	.728	.601	.127
Co-destructions	CDLE3	.608	.563	.045
	CDPR1	.757	.716	.041
	CDPR2	.747	.688	.059
	CDCN2	.618	.594	.024
	CDCR1	.773	.747	.026
	CDCR2	.786	.774	.012
	FUNE2	.874	.797	.077

Functional experiences	FUNE3	.921	.869	.052
	FUNE4	.788	.734	.054
Emotional experiences (positive)	EMEX1	.880	.829	.051
	EMEX2	.904	.775	.129
	EMEX3	.632	.619	.013
Emotional experiences (Negative)	EMEX5	.699	.629	.070
	EMEX6	.890	.893	.003
	EMEX7	.715	.618	.097
Past experience	Past experience	1.000	-	-

Among the two tests conducted to examine CMB, Harmen's single factor test confirmed that this study is free from common method bias. However, the CLF test indicated that only two items in the model were affected by common method bias.

As noted in the methodology chapter (see 3.5.3.2: Addressing common method bias), this research employed a number of procedural remedies (ex-ante approaches) at the research designing stage to reduce common method bias. Among these approaches, inclusion of three fake statements asking the respondent to circle a given response (eg: could you please circle 'strongly disagree' for this statement), to make sure whether they were filling in the questionnaire mindfully, was prominent. All the questionnaires that provided irrelevant answers to at least one of these questions were eliminated from the final data set, ensuring that respondents had responded to the questions carefully. Therefore, it was decided to carry out the data analysis disregarding the 'ex-post approaches' of undertaking statistical remedies for common method bias.

4.10 Transforming the measurement model into the structural model

As indicated in the methodology chapter, this study aims at testing hypotheses to understand the sequential effects of customer value co-creation intention, practices and experiences in self-service technologies. With that purpose, the measurement model was converted into a structural model, assigning relationships between constructs by single headed directional arrows. Hypothesised relationships between exogenous variables are represented by double headed arrows as covariance.

Based on the underlying theory, there are ten exogenous constructs and six endogenous constructs in this structural model. Performance, technology know-how, convenience, social influence, situational factors and information richness are the exogenous variables that predict customer value co-creation intention. Apart from that, past experience was

used as a single item construct to recognise direct hypothesised effects on 'value co-creation' and 'value co-destruction'. The co-creation intention, co-creation practices, co-destruction, functional experiences, positive emotional experiences and negative emotional experiences are the endogenous variable in this study.

After specifying all these structural relationships, the model became a 'recursive model' which explains the paths between constructs that proceed only from predictors to outcomes, without any arrows going forward and backward between them creating feedback loops (Hair et al., 2013).

4.10.1 Assessing the structural model validity

When comparing the structural model with the CFA model, the χ^2 value in the structural model is slightly higher, since relationships between some constructs (mainly endogenous variable) are assumed to be zero. Further, a recursive structural model cannot have a lower χ^2 value than the CFA model (Hair et al., 2013). Generally, "the closer the structural model GOF comes to the measurement model, the better the structural model fit, because the measurement model fit provides an upper bound to the GOF of a conventional structural model" (Hair et al., 2013:587). Hair et al. (2013) recommend reporting at least one absolute fit index, one incremental fit index and model χ^2 in reporting model fit. In the initial structural model, the χ^2 was 2684.162 with 1172 degrees of freedom ($p<.05$). The normed chi square was 2.290, which is in the acceptable range (below 3). The CFI was 0.903 and RMSEA was 0.056 with a 90% confidence interval of 0.053 to 0.058. RMR was 0.103 and SRMR was reported as 0.086. Since the structural model indicated room for improvement, the standardised residuals and modification indices were examined.

4.10.1.1 Examining model diagnostics

The standardised residuals and modification indices were examined to understand the needed model respecifications. All the standardised residuals were below 4, while the majority were under 2.5 at acceptable level. Connecting the error covariance between 'res1' and 'res2' which indicated a 55.530 modification index with par change 0.092 reduced the χ^2 value from 2684.162 to 2557.736.

4.10.1.2 Structural model fit indices

The model fit indices relevant to the structural model are provided in the following table. Even though the overall model fit is lower than that of the CFA model, the diagnostics indicate a considerably good fit.

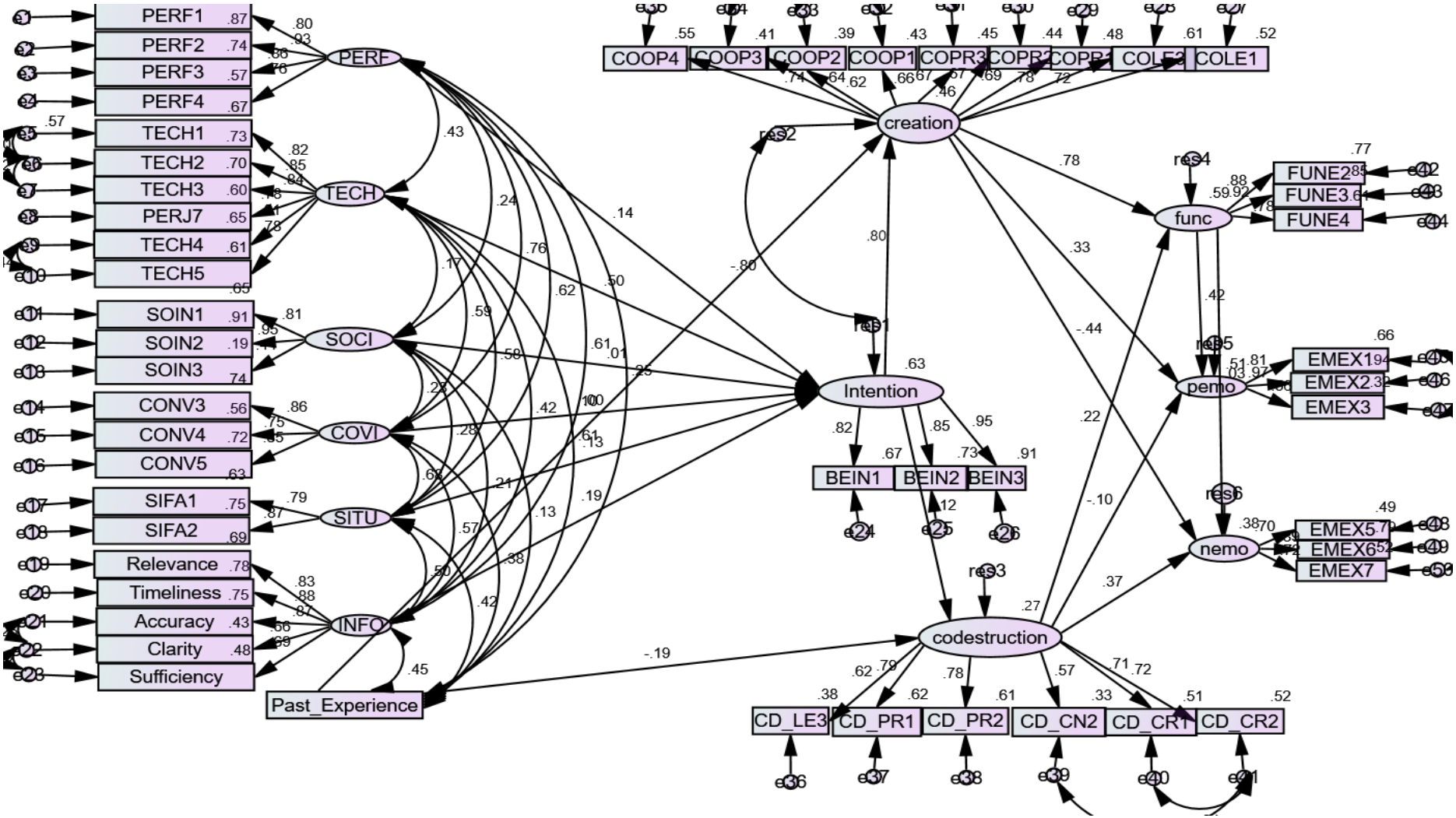
Table 4. 17: Model fit indices of structural model

Model fit Indices	Cut-off Value	Fit indices
Absolute Measures		
Chi- Square (x^2)		2557.736
Degrees of freedom		1171
Probability		0.000
Normed Chi square	< 3	2.184
RMSEA	< 0.07	0.053
90 percent confidence interval for RMSEA		0.050-.056
PCLOSE		0.0152
Root mean square residual (RMR)	< 0.08	0.103
Standardized root mean residual (SRMR)		0.077
Incremental Fit Measures		
Comparative fit index (CFI)	>0.9	.908
Tucker Lewis Index (TLI)		.899
Incremental fit index (IFI)		.908
Parsimony fit index (PGFI)		
Parsimony goodness-of-fit index (PGFI)		.705
Parsimony normed fit index (PNFI)		.774

4.11 Testing structural relationships

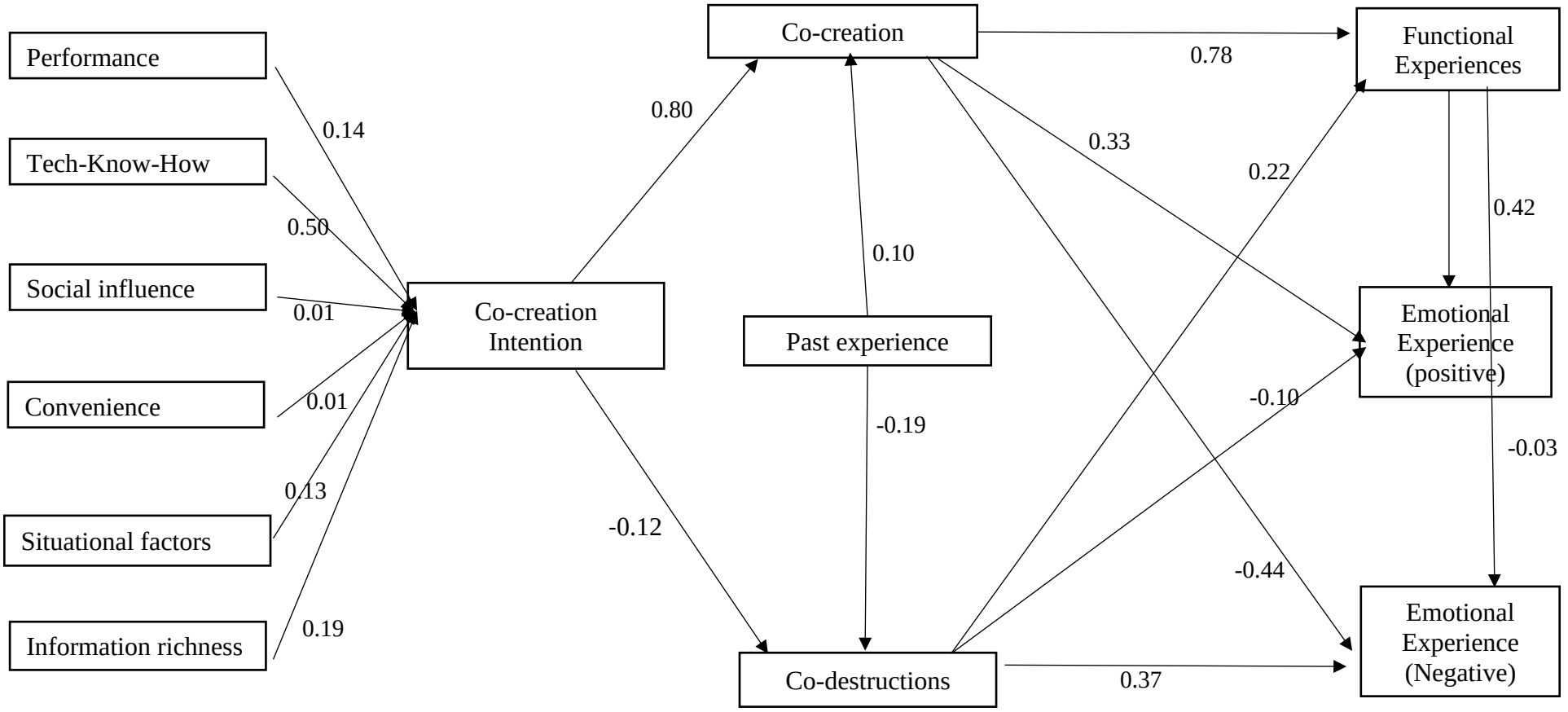
As Hair et al. (2013) suggest, standardised parameter estimates for each hypothesis, were checked for statistical significance and predicted direction. The hypotheses are mainly based on customers' value co-creation intention, practices and experiences in self-service technologies. The AMOS outcome of the structural model with standardised estimates is provided in the following figure.

Figure 4. 6: Structural model of value co-creation intention, practices and experiences in SSTs



To reduce the complexity and provide convenience of evaluation, the path model for the same structural relationships is given in the following figure.

Figure 4. 7: Path model of value co-creation intention, practices and experiences in SSTs



This study tests the hypotheses developed to understand customer value co-creation intention, practices (including co-destructions) and experiences in self-service technologies. Accordingly, the study first aims to test the influence of performance, convenience, technology know-how, situational factors, information richness and social influence on customer value co-creation intention with the moderating effect of age. As the next step, the study aims to identify how customer value co-creation intention and past experience affect customer value co-creation practices and co-destructions. Finally, the study tests how customers' value co-creation practices and co-destructions influence their co-creation experiences. Customer co-creation experiences are recognised mainly as functional and emotional experiences. Further, the study tests the relationship between customer functional experiences and their emotional experiences.

The following table summarises the outcomes of hypothesis testing with standardised regression weights, related standard errors, confidence intervals (95%) and p values.

Table 4. 18: Summary of hypothesis testing

Hypotheses	Hypotheses	Standardized regression	Standard Error	CI (95%) Lower	Upper	P Value	Decision
Performance -> Intention	H1a	.145	.052	.036	.269	0.002	Supported
Convenience -> intention	H1b	.013	.058	-.134	.129	0.980	Not Supported
Know-How -> Intention	H1c	.503	.047	.381	.615	***	Supported
Social Influence -> Intention	H1f	.008	.024	-.046	.074	0.747	Not Supported
Information Richness -> Intention	H1g	.186	.043	.093	.275	***	Supported
Situational Factors -> Intention	H1h	.133	.039	.036	.220	0.002	Supported
Intention ->Co-creation	H2a	.799	.056	.623	.865	***	Supported
Intention -> Co-destructions	H2b	-.125	.066	-.239	-.046	0.043	Supported
Past experience ->Co-creation	H3d	.101	.023	.013	.186	0.009	Supported
Past experience ->Co-destruction	H3h	-.188	.057	-.318	-.067	0.001	Supported
Co-creation-> Functional experience	H4a	.780	.076	.675	.864	***	Supported
Co-creation -> Emotional experience (P)	H4b	.328	.137	.158	.503	***	Supported
Co-creation -> Emotional experience (N)	H4c	-.439	.136	-.635	-.215	***	Supported
Co-destruction -> Functional experience	H4d	.217	.035	.128	.300	***	Not Supported
Co-destruction->Emotional experience(P)	H4e	-.102	.055	-.190	-.003	0.025	Supported
Co-destruction->Emotional experience(N)	H4f	.374	.058	.244	.496	***	Supported
Functional Ex:-> Emotional Experience(P)	H5a	.423	.103	.238	.583	***	Supported
Functional Ex:-> Emotional Experience(N)	H5b	-.031	.097	-.182	.238	0.705	Not Supported

Note: *** p<0.001

4.11.1 Further analysis to test hypotheses

Testing the moderating effect of age is required to complete the hypothesis test. Therefore, a multi-group analysis was conducted, and the findings are discussed below.

4.11.1.1 Multi group analysis – Age

Since the qualitative study and the literature pointed out a considerable difference between younger and older people in value co-creation, particularly in their co-creation intention in self-service technologies, the study aimed to statistically test the moderating effect of age in the quantitative stage. Without limiting to understand the effect of age on co-creation intention, the researcher was curious to extend this analysis to recognise whether there are any significant moderating effects of age on customer value co-creation practices and experiences.

The older generation in the United Kingdom has been defined as above 65 years (British Medical Association, 2016). However, in this study, the above 65 years age group was represented by only eight (1.9%) respondents. The number of respondents at the age level above 55 years also was limited to 58, which was 14.1% of the valid percentage. That sample size was not enough to perform SEM multi-group analysis. Finally, the mean and median age were checked and both values identified as 45 years. Therefore, in this study, the respondents below 45 years and above 45 years were taken for comparison. There were 249 respondents (60.6%) below 45 years old and 162 (39.4%) of above 45 years old among the group. Similarly, Eriksson and Nilsson (2007) also took 50 years as the cut-off age to differentiate young and old, due to the low representation of older population in the sample.

The χ^2 difference 154.567 with 57 degrees of freedom was significant at $p<0.001$, showing differences between groups. Therefore, it was important to check path differences to recognize exactly how these two groups differ in value co-creation at SSTs. The following table shows the chi square difference tests for each separate path.

Table 4. 19: Multigroup analysis-Age

Path			Path coefficient		χ^2 difference	P value	Decision
			<45Years	>45Years			
Performance	->	Intention	.270	.268	4.649	.031	Yes
Tech-know-how	->	Intention	.594	.339	10.625	.001	Yes
Social influence	->	Intention	.019	-.017	0.489	.484	No
Convenience	->	Intention	.131	.085	4.109	.042	Yes
Situational factors	->	Intention	.079	.163	0.571	.449	No
Information richness	->	Intention	.139	.241	0.595	.440	No
Intention	->	Co-creation	.799	.684	0.311	.576	No
Intention	->	Co-destruction	-.140	-.070	0.025	.873	No
Past-experience	->	Co-creation	.083	.109	0.001	.973	No
Past-experience	->	Co-destructions	-.231	-.217	.016	.896	No
Co-creation	->	Functional experience	.861	.753	5.418	.019	Yes
Co-creation	->	Emotional Experience (P)	.534	.042	7.872	.005	Yes
Co-creation	->	Emotional Experience (N)	-.272	-.483	2.914	.087	No
Co-destruction	->	Functional Experience	.305	.120	2.745	.082	No
Co-destruction	->	Emotional Experience (P)	-.153	-.018	3.264	.078	No
Co-destruction	->	Emotional Experience (N)	.612	.282	14.736	.000	Yes
Functional Experience	->	Emotional Experience (P)	.277	.639	2.211	.137	No
Functional Experience	->	Emotional Experience (N)	-.069	.042	0.376	.539	No

Multi group analysis found significant differences in six structural relationships. Performance, technology-know-how and convenience were found to differently influence value co-creation intention between these two age groups, with stronger effects among the below 45 years old group. Although convenience was insignificant in the focal model, it became significant with the moderating effect of age. Additionally, it was found that the effect of value co-creation practices on functional and positive emotional experiences was stronger in the younger age group. At the same time, the influence of value co-destruction on negative emotional experience was also found to be higher among the younger age group.

4.12 Hypothesis testing

This study developed hypotheses to test the sequential effects of customer value co-creation intention, customer value co-creation practices including co-destructions and customer value co-creation experiences in self-service technologies. The following sections report the results of hypothesis testing related to each of these purposes.

4.12.1 Testing hypotheses related to customer value co-creation intention in SSTs

H1a: The effect of 'performance' on customer value co-creation intention in SSTs is moderated by age, such that the effect is stronger for younger individuals.

> The results show that performance of SSTs has significant positive effect on value co-creation intention in SSTs. The standardised regression weight (0.145) was statistically significant at p=0.002. This effect is stronger among the 18-45 years age group (β=0.270) compared to the age group above 45 years (β=0.268) with $\Delta\chi^2$=4.649 at p=0.031. Thus, the hypothesis is supported.

H1b: The effect of 'convenience' on customer value co-creation intention in SSTs is moderated by age, such that the effect is stronger for younger individuals.

> According to the findings, the direct effect of convenience on customer value co-creation intention was insignificant. However, when the effect was moderated by age, it was found that convenience become significantly strong among the young

group (below 45 years) (β=0.131) compared to the above 45 years old group (β=0.085) ($\Delta\chi^2$=4.109, p=0.042).

H1c: The effect of 'technology know-how' on customer value co-creation intention in SSTs is moderated by age, such that the effect is stronger for younger individuals.

Technology know how was recognised as the most influencing factor on customer value co-creation intention, with a standardised regression weight 0.503 at the 0.001 significance level. Further, this effect was stronger for the below 45 years age group (younger) (β =0.594) than the above 45 years old group (β=0.339) with $\Delta\chi^2$=10.625 and p=0.001. Therefore, the hypothesis is supported.

H1f: The effect of 'social influence' on customer value co-creation intention in SSTs is moderated by age such that the effect is stronger for younger individuals.

An insignificant direct effect of 'social influence' on customer value cocreation intention in SSTs was found, and further this influence remained insignificant with the moderating effect of age.

H1g: The effect of 'information richness' on customer value co-creation intention in SSTs is moderated by age such that the effect is stronger for younger individuals.

The results demonstrate that information richness has significant positive influence on value co-creation intention in SSTs (β=0.186 with p< 0.001). However, age does not have any significant influence on this relationship.

H1h: Situational factors have a significant influence on customer value co-creation intention in self-service technologies.

Supporting the hypothesis, the study found a significant effect of situational factors on customer value co-creation intention in SSTs (β =0.133 and p= 0.002).

Summarising the findings, technology know how, performance, information richness and situational factors show significant positive influences on customer value co-creation intention in self-service technologies. Among them, 'technology know-how' shows the strongest impact while 'performance' was the next highest influencing factor on co-

creation intention in SSTs. Although the direct effect of 'convenience' was insignificant in the focal model, it became significant with the moderating effects of age, such that the effect was stronger for the below 45 years age group.

4.12.2 Testing hypotheses related to customer value co-creation practices in SSTs

The qualitative study recognised sixteen practices in collaborative value creation in SSTs, and further two dimensions of these practices as co-creation and co-destruction (Echeverri & Skalen, 2011). The quantitative stage primarily aimed at understanding how customer value co-creation intention influences customer value co-creation practices / co-destruction in SSTs. Further, as Warde (2005) suggests, this study examined the direct effect of 'past experience' on both value co-creation practices and co-destructions.

H2a: Customer value co-creation intention has a significant positive effect on value co-creation practices and a significant negative effect on value co-destructions in SSTs.

> Proving the hypothesis, results show that co-creation intention has a strong positive effect on customer value co-creation practices (β=0.799, $p < .001$) and a significant negative effect (β= -0.125, $p = 0.043$) on value co-destructions in SSTs.

H2b**:** Past experience has a significant positive effect on customer value co-creation practices and a significant negative effect on customer value co-destructions in SSTs.

> Past experience indicates a significant positive effect on customer value co-creation practices (β=0.101, p=0.009) and a significant negative effect (β= -0.188, p= 0.001) on value co-destruction in SSTs. Thus, the hypothesis is supported.

Summarising the above findings, the customer value co-creation intention has a strong positive influence on value co-creation practices, while having negative influence on value co-destructions. Similarly, past experience shows a significant positive effect on value co-creation and a significant negative effect on value co-destructions.

4.12.3 Testing hypotheses related to customer value co-creation experience in SSTs

Customer value co-creation experience in self-service technologies was measured with 'total customer experience perspective' understanding both the functional and emotional experiences. However, EFA and CFA findings recognised two major factors in emotional experiences: positive emotional experiences and negative emotional experiences. The

following hypotheses were tested to understand the effect of value co-creation and co-destruction on customer experience in SSTs.

H3 a: Customer value co-creation practices in SSTs have a significant positive effect on customer functional experience.

The results show a strong positive effect of customer value co-creation practices on their functional experience in SSTs (β=0.780, p<.001). Additionally, a significant difference was found in between two age groups, which is stronger among the 18-45 years age group (β=0.861) compared to the above 45 years old age group (β=0.753) at $\Delta\chi^2$= 5.418 and p=0.019.

H3 b: Customer value co-creation practices at SSTs have a significant positive effect on customer emotional experience.

The study recognises significant effects of customer value co-creation practices on their emotional experiences, with a significant positive effect (β=0.328, p<0.001) on positive emotional experiences and a significant negative effect (β=-0.439, p<0.001) on negative emotional experiences in SSTs. Additionally, it was found that the effect of co-creation practices on positive emotional experiences was significantly higher among the 18-45 years age group (β=0.534) compared to the above 45 years age group (β=0.042) at $\Delta\chi^2$ =7.872 and p=0.005. However, the effect of value co-creation practices on negative emotional experiences did not significantly differ between these two age groups.

H3 c: Customer value co-destruction has a significant negative effect on customer functional experience in SSTs.

Surprisingly, the results demonstrate a significant positive effect of value co-destruction on customer functional experiences in SSTs (β= 0.217 and p<0.001). This effect does not significantly differ between the two age groups.

H3 d: Customer value co-destruction has a significant negative effect on customer emotional experience in SSTs.

Value co-destruction in self-service technologies shows a significant effect on customer emotional experience, with a significant negative effect (β = -0.102, p= 0.025) on positive emotional experiences and a significant positive effect (β=

0.374, $p<0.001$) on negative emotional experiences. The study further found that the effect of co-destruction on negative emotional experience is significantly different between the two age groups, with a stronger effect among the below 45 years age group ($\beta=0.612$) than the above 45 years age group ($\beta=0.282$) at $\Delta\chi^2 =14.736$ and $p<0.001$. However, no such significant difference was found in the effect of co-destruction on positive emotional experiences.

H3 e: Customer functional experience in SSTs has a significant positive effect on customer emotional experience.

The functional experience shows a significant positive effect on customer positive emotional experiences in self-service technologies ($\beta=0.423$, $p<0.001$). However functional experiences show a negative but insignificant relationship with customer negative emotional experiences.

The findings indicate that, customer value co-creation practices in self-service technologies have a strong positive effect on functional experiences, significant positive effect on customer positive emotional experiences and a significant negative effect on negative emotional experience in SSTs. Co-destruction in self-service technologies has a significant positive effect on functional experiences, negative effect on positive emotional experiences and a positive effect on negative emotional experiences.

4.13 Post-hoc analysis

The researcher was curious to recognise whether value co-creation in SSTs is moderated by gender. Therefore, as a post-hoc test, another multi group analysis was run to recognise such differences.

The sample consisted of 212 males and 199 females were compared. The χ^2 difference 93.493 with 57 degrees of freedom was significant at 0.001, indicating a significant difference between females and males. Therefore, it was important to check path differences to recognise how these two groups are practically being different. The following table shows the chi square difference tests for each separate path.

Table 4. 20: Multi group analysis -Gender

Path			Path coefficient		Chi square	P value	Decision
			Male	Female			
Performance	->	Intention	.088	.138	0.304	.580	No
Tech-know-how	->	Intention	.416	.561	2.198	.138	No
Social influence	->	Intention	-.035	.064	5.706	.016	Yes
Convenience	->	Intention	.055	.030	0.595	.440	No
Situational Factors	->	Intention	.117	.147	0.116	.733	No
Information Richness	->	Intention	.282	.134	6.080	.013	Yes
Intention	->	Co-creation	.799	.785	0.107	.743	No
Intention	->	Co-destruction	-.087	-.207	1.205	.272	No
Past experience	->	Co-creation	.032	.126	1.546	.213	No
Past experience	->	Co-destruction	-.124	-.226	0.538	.462	No
Co-creation	->	Functional experience	.725	.846	0.538	.463	No
Co-creation	->	Emotional experience(P)	.286	.439	0.117	.731	No
Co-creation	->	Emotional experience(N)	-.522	-.282	3.019	.082	No
Co-destruction	->	Functional experience	.160	.271	0.807	.368	No
Co-destruction	->	Emotional experience(P)	-.110	-.076	0.273	.601	No
Co-destruction	->	Emotional experience(N)	.325	.474	0.902	.342	No
Functional experience	->	Emotional experience(P)	.484	.290	1.875	.170	No
Functional experience	->	Emotional experience(N)	.087	-.084	0.976	.323	No

However, only the effects of 'social influence' and 'information richness' were significantly influenced by gender. Importantly, although the direct effect of social influence was insignificant in the focal model, the multi-group analysis found it to be significant with the moderating effect of gender, with a negative effect for males (β=-.035) and a positive effect for females (β=.064) with $\Delta\chi^2$= 5.706 and p=0.016. Further, the effect of information richness on customer value co-creation intention was also found to be significantly higher among males (β=.282) than females (β=.134) ($\Delta\chi^2$= 6.080 and p=0.013).

4.14 Alternative models

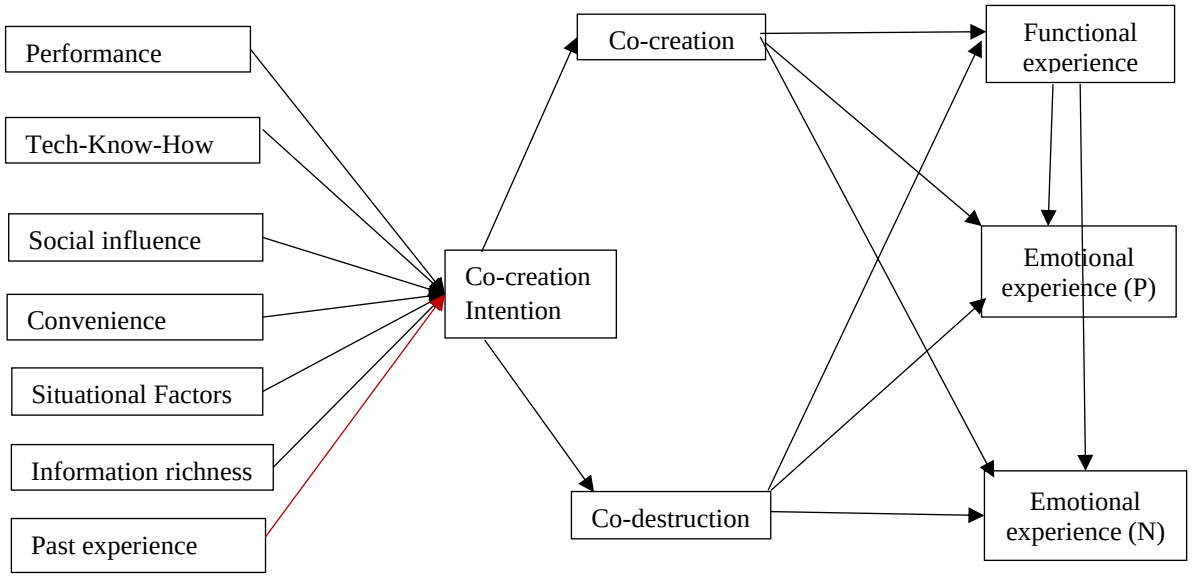
Hair et al. (2013) suggest comparing competing models whenever possible, since it helps to determine the relative superiority of conceptually similar models. The nested model approach was used by changing the structural paths (relationships) using the same set of variables. Model comparison was done by comparing incremental or parsimony fit indices along with 'χ^2 differences' ($\Delta\chi^2$) for each model. Hair et al. (2013:558) note that competing models should represent "truly different, but highly plausible", hypothesised structural relationships and by this means "the researcher comes much closer to a test of competing theories, which is much stronger than a test of a single model in isolation". Further, the more complex the model, the more equivalent models exist.

Two alternative models were developed without damaging the theory by removing/adding some paths from the focal model.

4.14.1 Alternative model -1

In the focal model, 'past experience' indicated direct link to the co-creation practices/ co-destructions since practices were recognised as routine behaviours that are predominately influenced by previous experience. However, there are numerous theoretical and empirical justifications are available to prove the influence of past experience on intention of accepting SSTs in co-creation, such as Demoulin & Djelassi (2016). Therefore, a new structural path was added linking 'past experience' and 'value co-creation intention' instead of its previous structural relationship with 'co-creation practices' in the focal model. The following figure illustrates the first alternative model.

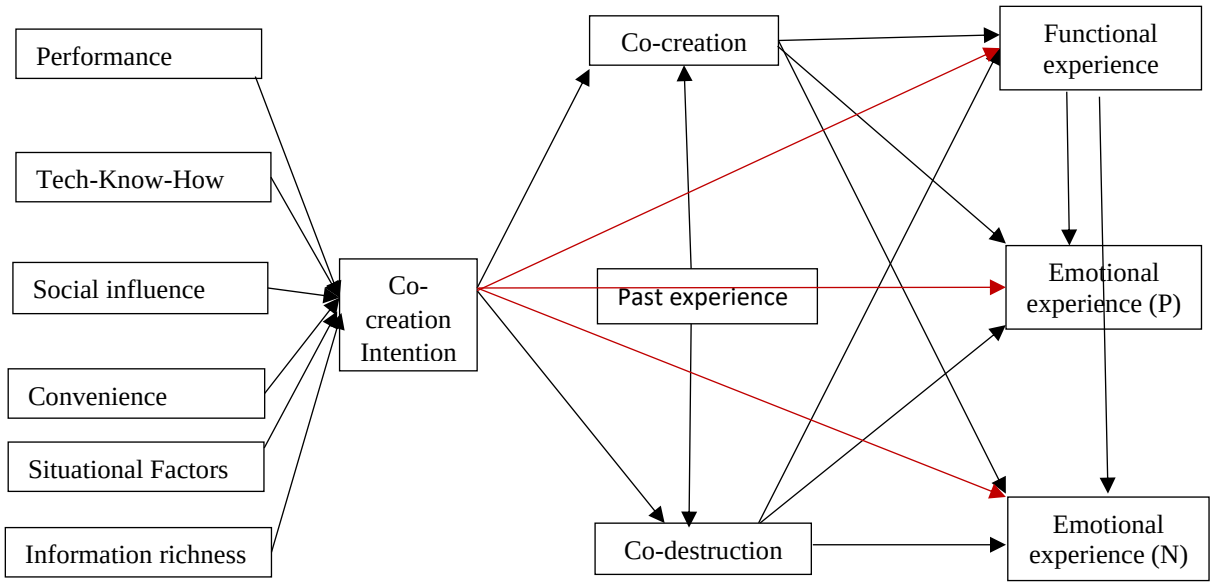
Figure 4. 8: Alternative model-1



4.14.2 Alternative model -2

The second alternative model was developed by connecting co-creation intention with experiences, to understand how customer value co-creation intention in SSTs (which is affected by performance, tech-know-how, situational factors and information richness) affects their co-creation experiences (functional and emotional). The following alternative model was developed to assess these hypothesised relationships.

Figure 4. 9: Alternative model-2



4.14.3 Alternative model comparison with focal model

As Hair et al. (2013) note, complex models can have many similar alternatives, as such the two alternative models presented in this study are not very much different from the focal model. The χ^2 difference test and related p values suggest that the focal model and alternative models are fairly similar and therefore explain the data quite similarly. Goodness of fit indices were used to compare the alternative models with the baseline model. A summary of fit indices in the focal model and the two alternative models are provided in the following table (table 4.21). As Hair et al. (2013:588) noted, "$\Delta df = 1$ means one additional path in model and $\Delta \chi^2$ of 3.84 or better would be significant at the .05 level". Therefore, if a model with one additional path provides a reduction of χ^2 than 3.84, then it can be concluded that the alternative model has a significantly better fit. However, in alternative model 1, reduction of one path caused to increase the chi-square by 9.56 ($\Delta\chi^2$=9.56, df=1) and in alternative model 2, three additional paths caused to reduce the chi square by 8.45 ($\Delta\chi^2$=8.455, df=3). These outcomes, do not show enough variation in χ^2 difference compared to the change in degrees of freedom, and therefore can suggest the alternative models are inferior to the focal model. Even though goodness of fit indices does not show a big difference, the $\Delta\chi^2$ suggest the superiority of the focal model.

Table 4. 21: Alternative model comparison

Model	NPAR	χ^2	DF	P	CMIN/DF	RMSEA	RMR	SRMR	CFI	IFI
Focal	155	2557.736	1171	.000	2.184	.053	.103	.0729	.908	.908
Alternative Model- 1	154	2567.294 $\Delta\chi^2$=-9.558	1172 $\Delta df=1$	.016	2.190	.054	.104	.0799	.907	.907
Alternative Model- 2	158	2549.281 $\Delta\chi^2$=8.455	1168 $\Delta df=3$	.029	2.183	.054	.103	.080	.908	.908

4.14.4 Path coefficients of focal model and alternative models

The following table shows the path estimates (standardised) with related p values for the focal model and two alternative models. As the model fit indices indicate that these models are quite similar in explaining the data, the standardised estimates of the main paths are also found to be quite similar in all three models.

Table 4. 22: Path coefficients of focal model and alternative models

Hypotheses	Hypothesis	Focal Model	Alternative model 1	Alternative Model 2	Decision
Performance -> Intention	H1a	.145**	.139**	.145**	Supported
Convenience -> intention	H1b	.013	.010	.015	Not Supported
Know-How -> Intention	H1c	.503***	.462***	.510***	Supported
Social Influence -> Intention	H1f	.008	.006	.008	Not Supported
Information Richness -> Intention	H1g	.186***	.174***	.184***	Supported
Situational Factors -> Intention	H1h	.133**	.119**	.167**	Supported
Intention ->Co-creation	H2a	.799***	.874***	.770***	Supported
Intention -> Co-destructions	H2b	-.125**	-.227***	-.127**	Supported
Past experience ->Co-creation	H3d	.101**	--------	.103**	Supported
Past experience ->Co-destruction	H3h	-.188**	---------	-.187**	Supported
Co-creation-> Functional experience	H4a	.780***	.776***	.663***	Supported
Co-creation -> Emotional experience (P)	H4b	.328***	.328***	.235**	Supported
Co-creation -> Emotional experience (N)	H4c	-.439***	-.446***	-.407***	Supported
Co-destruction -> Functional experience	H4d	.217***	.214***	.226***	Not Supported
Co-destruction->Emotional experience(P)	H4e	-.102**	-.103**	-.096**	Supported
Co-destruction->Emotional experience(N)	H4f	.374***	.373***	.377***	Supported
Functional Ex:-> Emotional Experience(P)	H5a	.423***	.425***	.428***	Supported
Functional Ex:-> Emotional Experience(N)	H5b	-.031	-.034	-.014	Not Supported
Past experience-> Intention		-------	.079**	-------	Supported
Intention-> Functional experience		-------	-------	.148**	Supported
Intention-> Emotional experience(P)		-------	-------	.113*	Supported
Intention-> Emotional Experience(N)		-------	-------	-.022	Not Supported

Note: ***p<0.001, ** p<0.05, * p<0.1

4.15 Chapter summary

This chapter provided the findings of quantitative data analysis in this study. First, data were cleaned and checked for multivariate assumptions. Then separate EFA and CFA were conducted to develop valid models to explain value co-creation intention, co-creation practices, co-destruction and co-creation experience in self-service technologies. Each model was checked for model fit, validity and reliability. Finally, all these individual measurement models were combined to develop the final model, which explains co-creation intention, practices and experience in a single platform and was checked for fit, validity and reliability. The structural model was developed out of this final measurement model and used to test the hypotheses.

Performance, technology-know-how, information richness and situational factors were identified as significant predictors of co-creation intention, while convenience and social influences became significant with the moderating effects of age and gender. Co-creation intention and past experience positively affect value co-creation, while having a negative effect on value co-destruction. Value co-creation shows a strong positive effect on functional experiences while indicating a moderate positive effect on positive emotional experiences and negative effect on negative emotional experiences. As predicted, co-destruction has inverse relationships, positively affecting 'negative emotional experiences' and negatively affecting 'positive emotional experiences. However, a significant positive effect of co-destruction was found on functional experiences. Finally, a significant relationship found in between functional experiences and positive emotional experiences.

Two alternative models were developed, by changing and adding some structural paths to the focal model. The first alternative model recognised the direct effect of past experience on customer value co-creation intention, where as the focal model shows direct effect on value co-creation practices and co-destruction. The second alternative model examined the direct effect of customers' value co-creation intention on their functional and emotional experiences in self-service technologies. Although both alternative models produced quite similar findings, $\Delta\chi^2$ indicated that the focal model is superior to the alternative models.

CHAPTER FIVE

DISCUSSION

CHAPTER FIVE
DISCUSSION

5.1 Introduction

The findings of the qualitative and quantitative studies have been reported in the previous two chapters (Chapter Three and Chapter Four). This chapter aims to broaden understanding of customer value co-creation in self-service technologies by comparing the study findings with available research evidence. This chapter begins with a brief overview of the research objectives followed by a short discussion of both the qualitative and quantitative research findings. Next, the findings related to three main study objectives in understanding customer value co-creation intention, practices and experiences in self-service technologies are discussed in detail, linked with existing research evidence.

5.2 Overview of the study findings

This study primarily aimed at understanding customer value co-creation in self-service technologies, particularly customers' value co-creation intention, practices (co-creation/co-destructions) and experiences. Since scholarly discussions on value co-creation in technological interfaces are very rare, this study was initiated with a qualitative study followed by a quantitative survey using a sequential exploratory strategy.

The qualitative study found 45 reasons for customer value co-creation intention in self-service technologies and categorised them into eight groups of factors, as performance, convenience, technology know-how, emotional reactions, personal judgements, social influence, information richness and situational factors. Apart from those age is viewed as moderating most of these relationships such that mainly the older people are reluctant to accept SSTs. The EFA and CFA are consistent with many of these factors, whereas 'emotional reactions', and 'personal judgements' are viewed as a combination of mixed items.

The qualitative study identified sixteen value practices in self-service technologies, and classified them into five groups of practices (5Cs) as Co-learning (seeking information, sharing information, recalling information, following instructions, providing feedback),

Co-production (producing the service, personalising the service, delivering the service), Co-operating (conforming to requirements, accepting terms and conditions, taking responsibility, changing habits, tolerating problems), Connecting (connecting with the service employees) and Correcting (preventing errors and recovering errors). However, with the purpose of reducing the model complexity, and further considering the nature of the suggestions of EFA and CFA, it was decided to consider all these practices as a single factor as 'value practices'. Aligning with Echeverri & Skalen (2011), this study recognised value co-creation and co-destruction as two key dimensions of the same practices.

'Total customer experience' concept was used in understanding customer value co-creation experience in SSTs, investigating both functional and emotional elements of experience. The literature and qualitative study provided eleven types of functional and emotional experiences which were categorised in the CFA under three groups as 'functional experiences', 'positive emotional experiences' and 'negative emotional experiences.'

As noted in the Chapter Four (quantitative study findings), the final measurement model for the quantitative study was developed combining these four pieces of CFA models (co-creation intention, co-creation practices, co-destruction and co-creation experience). After testing this full measurement model for fit, validity and reliability, it was converted into a structural model to test hypotheses. The quantitative study primarily aimed at 1. understanding the customer co-creation intention and its determinants, 2. examining the effect of customer value co-creation intention on their value co-creation practices/co-destruction and 3. examining the effect of customer value co-creation/ co-destruction on customer experiences in SSTs.

The quantitative study found significant positive effects of performance, tech-know how, information richness and situational factors on customer value co-creation intention in SSTs. 'Convenience' and 'social influences' became significant with the moderating effect of age and gender (discussed in detail in the findings chapter, and further in the following section of the discussion chapter). As expected, significant positive effects of 'customer value co-creation intention' and 'past experiences' were found on customer value co-creation practices while a significant negative effect was found on value co-destruction. Further, co-creation practices have significant positive effects on 'functional

experiences' and 'positive emotional experiences' while showing negative effect on 'negative emotional experiences'. Co-destruction also indicated positive effect on 'negative emotional experiences' and negative effect on 'positive emotional experiences' while surprisingly showed a positive effect on 'functional experience'. Finally, a significant positive effect of 'functional experience' was found on 'positive emotional experience' in the SST context.

5.3 Customer value co-creation intention in self-service technologies

As noted in Chapter Two (literature review), previous research has not particularly addressed customer value co-creation intention in SSTs. Instead, in similar contexts, there are some scholarly works on acceptance/trial/adoption of technologies including SSTs, which mainly have used general technology acceptance models such as TAM, UTAUT etc. (Pikkarainen et al., 2004; Weijters et al., 2007; Lee, 2016; Oh et al., 2016), although such models do not particularly explain the SST context (Blut et al., 2016). Apart from those, few studies such as Meuter et al. (2005); Liljander et al. (2006); Lin & Hsieh (2007); Hilton et al. (2013) have used several individual elements in understanding the SST context. Recognising inadequacy of a comprehensive model that specifically explains customer intention of collaborating with SSTs, this study employed a qualitative enquiry to explore the influencing factors of customer value co-creation intention in self-service technologies.

Recognising the same weakness in previous scholarly work of not having a comprehensive model to understand the SST acceptance, recently Blut et al. (2016) developed a model using a meta-analysis of general technology acceptance models. Although many of the findings in this study align with those of Blut et al. (2016), additionally this study found some important elements which were not discovered by them as their study was a result of a meta-analysis of typical technology acceptance models. This study argues the importance of situational factors, technology know-how, information richness and convenience, particularly for customer intention of collaborating with SSTs. A detailed discussion on the findings of both qualitative and quantitative studies on customer value co-creation intention in self-service technologies is provided in the following section, comparing with the existing scholarly discussions.

5.3.1 Determinants of co-creation intention in SSTs

This study measured customer value co-creation intention in SSTs with three questions (statements) focusing on their 'intention, plan and prediction' of co-creating value through SSTs. The results show a high level of customer co-creation intention in SSTs (M=5.797, SD=0.838). As noted above, the qualitative study recognised performance, convenience, technology know-how, emotional reactions, personal judgements, social influence, information richness and situational factors as key determinants of the customer value co-creation intention in SSTs. However, the quantitative study found only performance, technology-know-how, information richness and situational factors as having significant direct effects on customer value co-creation intention in SSTs. The effects of 'convenience' and 'social influences' became significant with the moderating effects of age and gender such that the effect of convenience is stronger for younger people and social influence has a negative effect for males and positive effect for females.

Performance

The qualitative study explored performance as an important determinant of customer value co-creation intention in SSTs comprising with eight elements: usefulness, speed, efficiency, consistency, cost-effectiveness, user-friendliness, reliability and trialability. However, the quantitative study found only, usefulness, speed, efficiency and consistency as properly explaining the construct, achieving standardised parameter estimates over 0.7 and meeting validity and reliability requirements. Notably, performance is a significant predictor of customer value co-creation intention in SSTs (β= 0.145, p=0.002) and this effect is moderated by age such that, it is stronger for the age group below 45 years (β= 0.270) than the above 45 years age group (β= 0.268) with $\Delta\chi^2$=4.649 and $p<0.05$.

In the available literature, 'performance expectancy' was recognised as the strongest predictor of technology acceptance in the UTAUT model, which is explained by five elements: perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectation. Although that model was developed for organisational contexts, they also found that the effect of performance is more stronger for younger workers (Venkatesh et al., 2003). Further, performance has been identified as an important predictor of attitude towards technology based self-service usage (Dabholkar & Bagozzi, 2002). When comparing each individual element in the 'performance' factor, 'perceived usefulness' has been discussed as one of the main construct (mediators) in TAM which

is influenced by many external variables (Venkatesh & Bala, 2008). Li et al. (2017) identify functionality of technology and task routine as important value co-creation determinants in electronic service. Further, in line with this study findings, usefulness (Curran & Meuter, 2005; Eriksson & Nilsson, 2007; Weijters et al., 2007), and increased efficiency (Meuter & Bitner, 1998), increased speed of service delivery (Berry, 1999) were recognised as important in both SSTs and general technology acceptance. Moreover, Froehle & Roth (2004) also point out the importance of efficiency, cost-effectiveness and the quality of operations in advanced information and communication technologies. Partially supporting the qualitative study findings, 'price advantage' (Dabholkar, 1996), reliability (Weijters et al., 2007), utilities (Curran & Meuter, 2007), and low risk (Beatson et al., 2006) were interchangeably identified as benefits and determinants of technology acceptance, including SSTs. Further, Hilton et al. (2013) also found the importance of organisational contexts including features of the interface, speed, control, reliability' in customer choice of SSTs.

Similar to 'usefulness' in this study, the 'perceived benefits', have been recognised as having significant effects on ATM adoption (Lee et al., 2003). Weijters et al. (2007) also found 'usefulness' and 'reliability' have significant effects on SST use. Further, supporting the outcomes of this study, Lee et al. (2003) found the importance of 'reliability' and 'security' in adoption to ATMs. Corresponding with the 'speed' and 'efficiency' elements in this study, Meuter & Bitner (1998); Beatson et al. (2006) similarly viewed the importance of 'time-saving', 'cost-saving' and 'reduced waiting time' as benefits/reasons to use SSTs. In line with the qualitative study findings, Castro et al. (2010) recognised the importance of 'user-friendliness' in encouraging self-service behaviours. Wu et al. (2017) found 'usability' as one of the e-servicescape dimensions having significant impact on consumer attitudes and trust toward websites.

Providing more supportive evidence to the findings of this study, Marr & Prendergast (1993) recognised 'efficiency' as important in encouraging customers to use self-service technologies in banking. However, Dabholkar (1996) found that 'speed of service delivery' and 'reliability' as insignificant in determining SST service quality. Lin & Hsieh (2011) developed the SSTQUAL scale to assess self-service technology encounters consisted of seven-dimensions including some performance characteristics such as functionality, security, assurance, design, and customisation. Consistent with findings of this study, Liljander et al. (2006) recognised that customers typically use self-service

technologies due to the efficiency in SSTs by time saving, avoiding queues, quickness etc. Meuter et al. (2005) recognised 'innovative characteristics' such as relative advantage, observability, trialability etc as influential in consumer trials of SSTs. In line with the findings of this study, 'utility', comprising cost, fast and convenience has been recognised as important in encouraging switching of existing users to self-service technologies (Curran & Meuter, 2007). Ding et al. (2007) note that service providers are also benefited by 'cost savings' mainly because customers perform service-related activities, that would otherwise have been performed by the firm's employees.

Technology know-how

Both qualitative and quantitative studies found that 'technology know-how', consisting of customers' knowledge of, computers, the internet and SST devices and the ease associated with learning and using SSTs, to be important in customer value co-creation intention in SSTs. The quantitative study found 'technology-know-how' as having the strongest effect ($\beta=0.503$, $p<0.001$) on customer co-creation intention. However, CLF test recognised that two of the items in this factor have been affected by the common method bias, questioning whether this effect has been inflated due to CMB problem. Further, this effect was found to be significantly stronger for the younger (below 45 years) age group ($\beta=0.594$) than the older (above 45 years) group ($\beta=0.339$) with $\Delta\chi^2=10.625$ and $p=0.001$.

Similar to this study's findings, Hilton et al. (2013) found the importance of 'consumer knowledge and skills' on choice of SSTs, and therefore they point out the necessity of considering this matter in the stage of designing technologies. Pointing out the importance of customers 'abilities' on SST trials, Meuter et al. (2005:63) note 'individual difference' as one of the main constructs as mediating the effect of consumer readiness. Further, the findings of this study aligns with Meuter et al. (2003); Liljander et al. (2006) who have recognised the importance of the user's state of mind and their 'ability and willingness' in consumer evaluations of self-service technologies. Supporting our view regarding the conceptual similarities of 'ease of use' and 'ease of learn' with 'technology-know-how', Dabholkar (1996:39) identifies 'ease of use' in SSTs as "ease of using the touch screen in terms of how easy or effortless it would be to use this option". Perceived ease of use is viewed as important in both acceptance of technology in general (Venkatesh & Bala, 2008) and SSTs in specific (Meuter et al., 2000; Weijters et al., 2007). The research

findings are also consistent with previous findings that, 'perceived ease of use' including the 'ease of learning' as having positive effect on attitudes toward an information system, individuals' intentions to use it and the acceptance of the information system (Davis, 1989). Venkatesh et al. (2003) view 'ease of learn' and 'perceived ease of use' under 'effort expectancy' in the UTAUT model. Since they examine the 'expectations', the effect was found to be stronger for women particularly older workers. In self-service technology context, Curran & Meuter (2005) found 'ease of use' including ease of learning as important in SST adoption.

Situational factors

The qualitative study suggested that situational factors such as crowding, urgency, task complexity, group/alone behaviour are important in customer co-creation intention in SSTs. It recognised that customers tend to use SSTs when physical service encounters are crowded, when customer is in a hurry, when the task is simple to perform and when they are alone. However, the quantitative study identified only crowding and urgency as important situational factors, found to have a significant effect on customer value co-creation intention (β=0.133, p=0.002).

Providing the similar evidences, Wang et al. (2012) found the implications of situational factors including perceived waiting time, perceived complexity of the task and the influence of other companions on the customer choice of self-scanning at supermarket stores. Similarly, perceived waiting time (Dabholkar,1996), waiting time and social anxiety (Dabholkar & Bagozzi, 2002), perceived service complexity (Simon & Usunier, 2007) also have been viewed as influential situational factors in selecting SSTs. Oh et al. (2016) found the importance of 'situational factors' including waiting and service complexity in SST adoption. Demoulin & Djelassi (2016) also found the influence of situational factors such as time pressure, basket size, coupons and queue length at the SSTs and staffed checkouts on actual customer usage of SSTs. Additionally, Dabholkar & Bagozzi (2002) noted the effect of 'crowding' on 'social anxiety' particularly, if other customers can see how they use especially some unfamiliar types of SSTs. Further, Oh et al. (2016) criticise TAM for not representing important 'non-technology' variables, such as 'situational factors' when considering adoption of SSTs.

Social influence

The qualitative study found social influence as an important determinant of customer value co-creation intention, especially among the younger generation. Most of the respondents acknowledged that use of SSTs is a 'social norm' and that its adaptation is acceptable. Further, the influence of 'personal sources' such as friends/peers was recognised as higher among the younger people. The influence of 'organisational sources' such as service employees was also pointed out by respondents. Although the qualitative study provided such insights, in the quantitative study, the direct effect of social influence and the influence with the moderating effect of age, both were insignificant in determining customer value co-creation intention in SSTs. However, it was found to be significant with the moderating effect of gender, with a negative effect for males (β=-0.035) and a positive effect for females (β=0.064) with $\Delta\chi^2$=5.706 at p=0.016.

Similarly, Venkatesh et al. (2003) found, social influences in UTAUT model as insignificant in determining technology acceptance when the data were analysed without any moderating effects, and became significant with all their four moderators (gender, age, experience, and voluntariness). Further, this study's outcome supports, Venkatesh & Morris (2000:132) comment regarding that "gender as a potential key to understanding the role of social influence on initial technology adoption decisions and sustained usage of new technologies". Venkatesh et al. (2000) also suggest that women are more sensitive to others' opinions, i.e social influences. Further, Curran & Meuter (2007) explain social acceptance as influential in intention to change behaviour in SSTs.

Convenience

The qualitative study recognised three main convenience factors associated with SSTs as, 'locational convenience, time convenience and lesser physical exertions'. As the study found, people choose SSTs simply because it provides 24 hours operation including after office hours/holidays etc, thereby providing more time convenience for them. Respondents also appreciated the locational convenience, such as opportunities given to perform many services at one's fingertips (eg: many online services) or in their most convenient places (eg: banking transactions at supermarkets, roadsides etc) with less physical efforts. However, surprisingly the quantitative data analysis found convenience as non-significant in explaining co-creation intention in SSTs. Nevertheless, this effect

became significant with the moderating effect of age, being stronger for younger people (below 45 years) (β=0.131) compared to the above 45 years of age (β=0.085) (χ^2=4.109, p=0.042). This outcome provide insights to think that young people are more convenience oriented (using fingertips and arm's length service transactions with SSTs) than older people. Wei et al. (2017a) found the importance of convenience as an extrinsic attribute that enhances customer satisfaction in SSTs. Convenience including locational benefits (Meuter & Bitner, 1998; Beatson et al., 2006) has been found as important in SSTs. Lin & Hsieh (2011) found convenience of 'operating hours' and 'reaching SSTs' as important elements in assessing self-service technology encounters. Marr & Prendergast (1993), also recognised time and place convenience as critical in encouraging customer to use self-service technologies in banking.

Information richness

Information richness has been recognised as vital in determining the co-creation in SSTs. The sufficiency, relevance, timeliness, accuracy, clarity, consistency and simplicity of information/instructions were recognised among them. The quantitative study indicated this as a factor that significantly influence (β=0.186, p<0.001) on customer co-creation intention in SSTs. Further, this effect is significantly moderated by the gender being stronger for males (β=0.282) than females (β=0.134) with $\Delta\chi^2$=6.080 and p=0.013. Similar to this study, Froehle & Roth (2004) recognised 'information richness' as an influencing factor on customer beliefs related to technology mediated services. Marr & Prendergast (1993) also supported the findings of this study, recognising the simplicity of instructions as one of the important factor that encourage customer use of SSTs in banking.

Emotional reaction towards SSTs

The qualitative study identified individuals' emotional reactions towards SSTs as important in determining their co-creation intention. Love, enjoyment, fear, guilt and feelings of isolation with SSTs have been captured as important and further different for each individual, and noticeably between the younger and older generations. Younger people were recognised as loving to work with SSTs and enjoying interactions with technologies, while many of the older people were identified as being afraid to use SSTs. Further, some of the respondents expressed a guilty feeling towards SSTs, since they

cause reduced job opportunities and involve fewer interpersonal relationships. However, a pure factor was not been recognised by the quantitative study (EFA). Instead, a factor with two items from 'emotional reactions' (love and enjoyment) and one item from 'performance' (user-friendliness) was recognised. This factor was also rejected in the CFA stage, due to low regression weights and discriminant validity issues.

However, in line with the qualitative findings of this study, enjoyment (Pikkarainen et al., 2004; Curran & Meuter, 2007; Füller et al., 2009), fun (Dabholkar & Bagozzi, 2002) and perceived fun (Weijters et al., 2007) were recognized as encouraging factors, while technology anxiety (Meuter et al., 2003; Liljander et al., 2006), fear (Marr & Prendergast, 1993) were identified as negative influences on SST use/adoption in the literature. Comparable with 'isolation' in this study, Anton (2000) found that customers generally seek human interaction at the service encounter. Similarly, Dabholkar (1996); Lee (2017) claimed that 'need for interaction' affects disposition towards SSTs. Providing more supportive evidences, Meuter et al. (2005) identify 'need for interaction' as having a destructive effect on consumer trials of SSTs, while Curran & Meuter (2005) found insignificant effects of 'need for interaction' in intention to use ATMs and online banking.

The 'fear' element in this study, can be seen as similar to 'technological anxiety' which Meuter et al. (2003); Liljander et al. (2006); Wang et al. (2016) found as a reason for unwillingness to use SSTs. In similar contexts, Venkatesh et al. (2003) found an insignificant effect of 'computer anxiety' on technology acceptance. Marr & Prendergast (1993) view 'fear' as one of the elements that discourage the use of SSTs. Meuter et al. (2005) identify factors such as 'inertia and technology anxiety' as individual differences that effect consumer trials of SSTs. 'Enjoyment' was identified as one of a factor with strong influence on customers' willingness to engage in online value co-creation (Füller et al., 2009). Similarly, Lin & Hsieh (2011) recognised enjoyment as one of the important elements in SSTQUAL scale to assess self-service technology encounters. Perceived fun was recognised as having significant effect on SST use (Weijters et al., 2007).

Personal judgements

Personal Judgements such as individuals' subjective evaluations of trust, risk, privacy, independence, self-efficacy, self-control, external control, voluntariness and personal judgment on resource availability were identified by the qualitative study as important in

customer co-creation intention in SSTs. However, these elements were recognised as highly subjective and different among individuals, especially between younger and older people. As the study found, younger people believe SSTs secures their privacy and independence and that they have high level of self-efficacy. In contrast, older people think SSTs as a risk and a threat to the privacy, and they are less confident in SST performance. The quantitative study did not recognise a pure factor for these elements, instead EFA recognised a factor with three items, including two items from personal judgement (trust and privacy) and one item from 'performance' (reliability) while all these three items indicate comparatively low loadings (0.448, 0.408, 0.434). The CFA model rejected this factor due to low regression weights and discriminant validity issues.

Previous research shows mixed evidence on the salience of personal judgement. Curran & Meuter (2005) point out the differences among individuals, some as being 'unsure and uncomfortable' with technology while others may enjoy it as a new social and personal experience. Further, Curran & Meuter (2005) found risk as insignificant in ATM adoption while Blut et al. (2016) also found the same as intention to use SSTs was not influenced by 'risk'. Venkatesh et al. (2003) found insignificant effects of 'computer self-efficacy' on technology acceptance.

In line with qualitative study findings, the literature explains the influence of consumer evaluation of risk (Beatson et al., 2006), personal control (Lee & Allaway, 2002), and perceived risk (Walker & Johnson, 2006) on consumer attitudes towards SSTs. The differences among individuals are supported by, Nijssen et al. (2016) who found that low-benefited individuals (who are low in self-efficacy, education, etc.), as revealing a damaging relationship with the firm. Exploring how the risk factor is associated with SSTs, Featherman & Hajli (2016) found six types of risks particularly in e-services: performance risk, financial risk, privacy risk, time risk, psychological risk, and social risk. Comparing some of these elements between users and non-users of SSTs, Liljander et al. (2006) found four factors, including discomfort and insecurity, as leading to different levels of technological readiness between users and non-users in SST acceptance. Lin & Hsieh (2007) recognise 'technological readiness' as important in SST acceptance. Elaborating more on the 'trust' factor, Wang et al. (2016) found that lack of trust towards technology cause unwillingness to use SSTs. Influences of personal control on the adoption of self-service technologies were found by Lee & Allaway (2002) considering predictability, controllability and outcome desirability as dimensions of

personal control. In similar context, Lee & Lyu (2016) found 'personal values' and 'consumer traits' as important in determining the intentions to use self-service technology in retailing via building attitudes.

Demographic differences

According to the findings of the qualitative study, demographic differences, especially the age was found as imperative in determining customer intention of collaborating with SSTs in creating value. Particularly, younger people were recognised as clever in using technologies, considering SSTs as a social trend which need to be followed. As opposed to that, the older people showed a fear and suspicion towards using self-service technologies. Though gender is recognised as not much influential as age, especially young males were noticed as more keen and enthusiastic towards using self-service technologies. Apart from these qualitative study outcomes, the quantitative study found the effects of performance, technology-know-how and convenience on customer value co-creation intention were significantly different between younger and older age groups, such that all these effects were stronger for younger (18-45 years) age group. The effects of 'information richness' and 'social influences' on customer value co-creation intention was significantly moderated by gender. Social influences indicated a negative effect for males (β=-0.035) and a positive effect for females (β=-0.064) with $\Delta\chi^2$=5.706 at p=0.016, while the effect of information richness was stronger for males (β=0.282) than females (β=0.134) with $\Delta\chi^2$=6.080 and p=0.013.

However, a true representation of older population was not depicted in this study. The reason for that was, very limited number of old responders (only 8) who were above 65 years included to the sample. Therefore, this study considered mean and median of age (both were 45 years) to determine the cut-off for two age groups. Though it is not fair, due to low representation of older population in the quantitative surveys, Eriksson & Nilsson (2007) also used below 50 as 'young' and over 50 as 'older' in their identification of determinants in SST continuation.

In line with some findings in this study, Dean (2008) proves that older generation having fewer experience with SSTs and less confidence in performing SST transactions. Elliott & Hall (2005) note a different effect of gender whereas males are innovative while females are feeling discomfort and insecurity in propensity to embrace SSTs. Simon &

Usunier (2007) recognise age has strong negative effect on preference towards SSTs over personal contacts. Blut et al. (2016) find that demographic variables (age and gender) as not effective predictors of SST acceptance and therefore suggest using as moderator/ control variables in future research. Lee et al. (2003) found significant effects of age, education and income on ATM adoption. Shulga et al. (2018) note that millennials tend to co-create value with open source technologies, than other age generations.

However, Dabholkar & Bagozzi (2002) note that demographic factors are not important in understanding customers use of SSTs because the current environment provides vast range of opportunities for all to be familiar with simple technologies disregarding that they are "women, older consumers, the less educated, and the less affluent". Cross-cultural variations in consumer demographics in adopting to self-service technologies were studied by Eriksson & Nilsson (2007), proving that demographic differences are not significant in developed markets. Further, Venkatesh et al. (2003) found, significant moderating effects of gender and age on technology acceptance in UTAUT model, while none of the significant differences of age on the use of SSTs was found by Dabholkar et al. (2003) and Weijters et al. (2007).

5.3.2 Customer value co-creation practices in self-service technologies

After recognising customer value co-creation intention, as the next step, the study moved to explore customer value co-creation practices (what customers do) in self-service technologies. Refering to literature that suggests the suitability of practice-based approach in exploring value co-creation, (Schau et al., 2009; Korkman et al., 2010; Echeverri & Skalen, 2011; McColl-Kennedy et al., 2012; Carù & Cova, 2015; Neghina et al., 2015; Vargo et al., 2015; Vargo & Lusch, 2016), this study used 'practice theory' to understand customer value co-creation practices in self-service technologies.

As noted in the findings, the qualitative study recognised sixteen customer value co-creation practices in self-service technologies, then, categorised them into five groups of integrative value practices (5Cs) as Co-learning (seeking information, sharing information, recalling information, following instructions, providing feedbacks), Co-production (producing the service, personalizing the service, delivering the service), Co-operation (conforming to requirements, accepting terms and conditions, taking responsibility, changing habits, tolerating failures), Connecting (connecting with the service firm) and Correcting (preventing errors and recovering errors). The identification

of these sixteen value co-creation practices in this study, is similar to Schatzki (1996:91) who suggested ‘dispersed practices’ (practices such as describing, following rules, explaining, imagining etc) and five groups of value practices which are comparable to ‘integrative practices’ (specialised forms of dispersed practices).

The understanding of value co creation/co-destruction in this study aligns with Echeverri & Skalen (2011) who view value co-creation and co-destructions as a duality of value outcomes, such that the same practices result in value co-creation to some people while causing co-destruction to others. Although this study used practice theory to understand both customer value co-creation and co-destruction, co-destruction was not termed as ‘co-destruction practices’, since customers do not purposely practise co-destructions, as in customer misbehaviours. This study realised that co-destruction happens mainly due to inabilities, unwillingness, mismatching of expectations and unexpected situations in performing practices in SSTs. Therefore, this study recognised the same practices in both co-creation and co-destruction. For an example, abilities in performing the practice called ‘following instruction’ lead to successful value co-creation, while lack of such ability may result in value co-destruction. Supporting that view, Echeverri & Skalen (2011); Laamanen & Skalen (2014); Carù & Cova (2015); Camilleri & Neuhofer (2017) emphasise the possibility of both positive and negative effects for the same value practice.

Although the practices identified in this study are typical value co-creation practices in SSTs, every individual does not necessarily need to perform every practice in co-creating value with SSTs. Instead, based on the types of the SST, their requirement, situation, and their previous experience, customers can skip some of the practices. For example, searching information might not need if the customer is well experienced in performing that type of SST, and practices such as connecting or correcting may not require unless the customer face a problem in SSTs. This was demonstrated by, Sandström et al. (2008) who found dimensions of value co-creation to be personal to every individual, according to the situation in which the customer is acting.

Further, this study recognised the interconnectivity of value co-creation practices/co-destructions such that the way of performing one activity causes successes or failures of another one or more activities. For example, if a person can search for information and/or follow instructions properly, it may enable him/her to perform the transaction or personalise the service successfully, whereas inabilities in these areas cause failures

resulting in value co-destruction. Supporting this view, Stieler et al. (2014:72) note that one reason for value co-destruction can be easily caused by another, creating risks and negative outcomes.

However, this 5Cs typology was not wholy supported the quantitative study, showing problems with discriminant validity. As noted earlier, interconnectivity of these practices with each other could be a reason for this issue. Considering this matter, and with the aim of reducing the model complexity, it was decided to consider these practices together as a single factor and continue with the quantitative analysis. The following discusses the 5Cs in customer value co-creation practices.

Co-learning

The qualitative study found ‘co-learning’ as an important integrative value co-creation practice in SSTs and outlined as “collaborative learning through the use of technologies and human interactions, enabling enhancement of knowledge and performance of individuals and the society." Five important practices in ‘co-learning’ in SSTs were found to be seeking information, sharing information, recalling information, following instructions and providing feedback. Further, this study recognised that except for ‘feedback,' the four remaining factors are highly important in customer co-learning, as if competencies fall short in these practices, it may result in value co-destructions.

The respondents noted that ‘seeking information’ is more highly practised in online and internet based self-service technologies than others. The provision of abundant information in the internet is recognised as a great opportunity to perform this practice. Further, inability to gather the most relevant information can prevent customers taking the best decision in SST-based transactions, resulting in value co-destructions. Need for sharing requested information with the service provider and sharing their experiences and perceptions with other customers in the forms of reviews etc were recognised in ‘sharing information’. However, ‘sharing personal information’ such as email address, postal address, passwords and credit/debit card details were recognised as cooperative behaviour of customers rather than as ‘information sharing’. Remembering frequently needed information such as passwords, e-mails, bank account details etc were included to ‘recalling information’ practice. Although this may seem like a simple practice, respondents pointed out that value co-destructions happened due to forgetting such

information. The majority view was that, ‘following instructions’ is a key practice in value co-creation in many SSTs. It mainly depends on the past experience and the nature of the transaction whether it is simple or complex with more customisations. ‘Providing feedback’ is viewed as an optional and rare practice which mainly depends on the value co-creation experience of the customer, such as whether they experience extreme conditions like being extremely satisfied or extremely dissatisfied.

This outcome is in line with a number of previous research evidence which available in co-creation at physical interfaces, recognising ‘information seeking’ as an activity in co-creation (McColl-Kennedy et al., 2012; Yi & Gong, 2013; Neghina et al., 2015). Yi & Gong (2013) identify ‘information seeking' and ‘information sharing' as factors of ‘customer participation behaviour' while recognising ‘feedback’ as a factor of ‘citizenship behaviour’ which is voluntary in customer co-creation. As suggested by Yi & Gong (2013), this study also found ‘providing feedback’ as a rare and optional practice in customer value co-creation in SSTs. This study supports, McColl-Kennedy et al. (2012) in viewing that ‘actively seeking and sharing information’ as co-learning, while the same is confirmed by Tommasetti et al. (2015) adding ‘feedback’ as another component of co-learning. Further, the findings of this qualitative study are in line with, Neghina et al. (2015), who recognised ‘knowing’ as a precursor of value co-creation, comprising with information seeking, information sharing and feedbacks. Providing similar understanding, Payne et al. (2008) identify three types of customer learning including remembering, internalisation and proportioning. Further, the role of ‘knowledge sharing’ is recognised as vital in co-creation (Higuchi & Yamanaka, 2017) as ‘knowing’ provides value-in-use to the customer (Ballantyne & Varey, 2008). Carù & Cova (2015) identify ‘informing’ as one of the value practices in brand community. Payne et al. (2008:382) recognise two perspectives of customer learning in co-creation as first, ‘using a sense-making, cognitive perspective’, and second, ‘identifying the experiences embedded in the co-creation processes’.

Co-producing

Aligning with Auh et al. (2007:361), this study defines co-production as "constructive customer participation in the service creation, production and delivery process." The qualitative study found service co-production as an essential component in value co-creation in SSTs whereas other co-creation practices surround it to confirm its success.

This study recognised three main practices in co-production as customer collaboration in ‘producing,' ‘personalising,' and ‘delivering' the service. Further, this study found that inabilities in performing these practices cause in value co-destruction. Some of the respondents pointed out that the growth of SSTs from simply allowing basic service co-production to more personalisation of the service creates more complexities, resulting in inabilities to perform transactions successfully. However, some of the respondents were happy with more personalisation options available in SSTs since it helps them to perform a highly individualised service. Door-step deliveries, tracking facilities available with online SSTs were appreciated by some respondents, while some still preferred offline contexts.

The literature notes that the active role performed by the customer in co-production (Cova & Dalli, 2009) was established in decades ago (Gronroos, 1978; Lovelock & Young, 2010). Further, customer involvement in service production is recognised as a fundamental role in service marketing (Zeithaml et al., 1985) and a prime co-creation activity in self-service technologies (Lovelock & Wirtz, 2004; Hilton et al., 2013). Previous literature discussed the concepts of ‘service co-production’ and ‘value co-creation’ as separate but interconnected concepts (Ordanini & Pasini, 2008; Vargo, 2008; Hilton et al., 2013). Aligned with this study, co-production is recognised as a component of co-creation (Vargo & Lusch, 2007). Providing similar evidence, Lusch et al. (2008) and Etgar (2008) also view co-production as a component of co-creation and Hilton et al. (2013:04) state that “the co-creation is a given while the degree of co-production might vary” particularly in the context of SSTs. Supporting the interpretation of this study, co-production is recognised as something close to customer integration in the production process, whereas co-creation captures the collaborative nature of value creation (Vargo, 2008), which can occur with or without co-production (Vargo & Lusch, 2008b). However, Etgar (2008) and Terblanche (2014) distinguished between co-production and co-creation concerning the stage of customer participation, limiting co-production to the production stage, as customer involve in the development of the co-offering (Lusch & Vargo, 2006b; Tommasetti et al., 2015).

As this study recognised with service personalisation, Quinn et al. (1990) note that customers are now expected to perform more complex tasks than simple ordinary transactions in SSTs. Supporting the interpretation this study, Tommasetti et al. (2015) classify co-design and co-delivery as components of co-production. Marcos-Cuevas et al.

(2016) also note co-design as an important value practice in B2B context. Further, co-production can occur through shared incentives, co-design or shared production of related goods (Lusch & Vargo, 2006b).

Providing a broader view, Frow et al. (2015) identify twelve forms of co-creations including co-design, co-production, co-distribution. Comparable with the findings of this study, opportunities for customisation and precision (Berry, 1999), higher level of customisation, greater control over the service delivery (Meuter & Bitner, 1998; Beatson et al., 2006) were recognised in co-production. Cunningham et al. (2008) differentiate self-service technologies based on the avenues provided for customisation. Similarly, personalising the service is recognised as important in determining the level of value co-creation (Rose et al., 2011), which in turn is based on the customer's specific needs, conditions and personal taste (Romero & Molina, 2011). Haas et al. (2012) find co-designing as an important determinant of co-creation while Quero et al. (2017) identify seven types of value co-creation, including co-design. Equally, 'performing' was recognised as one of the value practices in brand community (Carù & Cova, 2015).

Co-operation

Following McColl-Kennedy et al. (2012), this study, outlines the co-operation as "adherence to the prerequisites and preparation for the collaborative work." The qualitative study recognises five components in co-operation as 'conforming to basic requirements,' 'accepting terms and conditions,' 'taking responsibility,' 'changing habits' and 'tolerating failures.'

As the qualitative study found, producing proofs of identification (e.g. residence address, telephone numbers, email addresses), having one's own bank accounts, presence of credit/debit cards/accepted coins etc. are the basic requirements to conform with when perform in SSTs, though these requirements may vary with the type of SSTs. 'Terms and conditions' are recognised as applied to many SST transactions, especially in online and internet-based self-services, some 'interactive kiosks' etc. As respondents point out, such terms and conditions are hidden/, or customers just agree with them for the sake of continuing the service transaction, rather than reading carefully and understanding them. Therefore, as respondents showed, this can adversely affect them, resulting in value co-destructions. Taking responsibility for the successes or failures of SST transactions was

recognised as another co-operative behaviour of customers, since the service outcome is self-generated. Older people show fear towards taking responsibility for SST performance and therefore prefer to stay with interpersonal interactions. Changing habits from having interactions with physical interfaces to accepting technological advancements in self-service behaviours was also recognised as prominent among younger people. Finally, respondents showed that being co-operative with the service providers by tolerating service failures is also important. However, some people indicated that they felt nervous and stressful with SST failures.

Though not confined to the self-service technology context, the findings in this study are consistent with, McColl-Kennedy et al. (2012) who recognise co-operation as an activity in value co-creation, identifying 'accepting information from the service provider,' 'changing ways of doing things' and 'compliance with basics' as examples. Further, Tommasetti et al. (2015) confirm the view of McColl-Kennedy et al. (2012), recognising 'compliance with basics' and 'responsible attitude' as two main variables in co-operation naming them 'pragmatic adaptation' and 'change management'. Similar to this study's findings, 'tolerance' has been identified as one element in 'customer citizenship behaviour' while 'responsible behaviour' is viewed under the 'customer participation behaviour in value co-creation (Yi & Gong, 2013). Moreover, Ind & Coates (2013) recognise customer active participation with organisations by providing suggestions, and being cooperative and conscientious (Bettencourt, 1997) in co-creation. Additionally, Bendapudi & Leone (2003) and Harris et al. (2006) identify that there is less potential for blaming service firms in service failures at self-service technologies since the customer is taking the self-responsibility for the transaction.

Connecting

This study defines connecting in SSTs as, "connecting with the service organisation when required", which was recognised as 'building and maintaining relationships,' in physical interfaces with interpersonal interactions (Tommasetti et al., 2015). This study found that customer relationships with the service employees in SSTs are largely limited to situations where customers face problems or difficulties in performance. Therefore, failure in connecting to a responsible service employee who can solve the customer's problem frustrates the customer. As participants said, providing automated voice recordings rather than connecting to a service employee caused more annoyance.

The findings of this study resonate with Randall et al. (2011) who identify ‘connection’ as a construct of co-creation. Although customers do not have regular interaction with the service employees, inability to contact them whenever necessary causes annoyance and leads to value co-destruction. Proving this, Kristensson et al. (2008) note that the lack of regular personal interactions with customers in SSTs leads to poor understanding of the customers.

Correcting

The qualitative study recognised ‘correcting’ as an important value co-creational element in SSTs, which was defined as “preventing errors from adhering to the precautions and/or obtaining recovery actions after the occurrence." Accordingly, this study found ‘preventing’ and ‘recovering’ errors as elements in ‘correcting’ failures. Warning messages, alarms and cancellation procedures in SSTs were recognised as vital mechanisms of error prevention. If errors occurred, recovering them through different procedures such as self recovering or informing the service provider were also viewed as critical in overall value creation process. According to the qualitative findings, non-responsive behaviour of customers to prior warnings can lead to unexpected failures. Further, the majority of the respondents were unhappy with the poor recovery efforts taken by service firms.

In line with this study, Shin et al. (2017) point out the importance of proactive customer interactions on service failure prevention rather than focusing on obtaining reactive actions to recover service failures. Further, Hilton & Hughes (2013) note the necessity of service employees to perform ‘self-service recovery’ tasks in SSTs, since they require different knowledge and skills. Similar to the findings in this study, ‘failures with technology’, ‘personal faults’, and a combination of both are recognised as main reasons for SST failures (Snellman & Vihtkari, 2003). Similarly, technology failures and process failures were identified as the major factors which result in customer complaining behavior and dissatisfaction, which is higher in SSTs compared to interpersonal interfaces (Meuter et al., 2000). Additionally, Fan et al. (2016) found that consumer reactions to SST failures vary depending on the degree of anthropomorphism associated with SST machines (adding human-like traits, motivations, intentions, emotions and behaviours to non-human agents), individuals' sense of power and the presence of other customers.

Literature uses a common term ‘service recovery’ to denote actions taken to mitigate or repair the damage. Dong et al. (2008:126) define the service recovery in co-creation from customers’ standpoint as “the degree to which the customer is involved in taking actions to respond to a service failure” and found three types of service recoveries, depending on the party involved, as firm recovery, joint recovery and customer recovery. Heidenreich et al. (2015) contend that in highly co-created services, customers seem too responsible for the failure which makes them feel guilty and therefore they can alleviate the guilt by actively engaging in recovery actions. Harris et al. (2006) found customers blame themselves for SST failures. Snellman & Vihtkari (2003) point out that, as customer complaints are important in service recovery, responses to service recovery are also vital.

5.4 Customer value co-destructions

In line with Ple & Cáceres (2010:431), this study define value co-destruction as “an interactional process between service systems that results a decline in at least one of the systems’ well-being”. As expound in the above section and further in the findings chapter, this study witnessed that the same practices which were recognised in value co-creation, could result in co-destruction, mainly due to the customer’s inabilities, unwillingness, expectations and situations. Supporting that, Echeverri & Skalen (2011) view value co-creation and co-destructions as dimensions of the same value practices, that can caused value co-creation to some people and value co-destruction to others. Similar evidences of the potential for both positive and negative effects of the same value practice was found in the previous literature, such as Echeverri & Skalen (2011); Laamanen & Skalen (2014); Carù & Cova (2015); Camilleri & Neuhofer (2017).

Consistent with the findings this study, previous scholars identify that the potential for co-creation depends on “how ‘adaptive’ an actor is, that is, an actor’s ability to work with others (either actors or resources) in a mutually beneficial manner” (Fyrberg Yngfalk, 2013:1165) and therefore positive outcomes are not always guaranteed in co-creation (Terblanche, 2014:7).

As noted above, due to the interconnectivity of these practices, inability to perform one or a few activities may link with others, finally causing failures in the entire value creation process resulting in value co-destructions. For an example, inability to search for the right information could result in failures in following instruction, producing the service, personalising the service etc ultimately resulting in value co-destruction. This is

consistent with Stieler et al. (2014) who view of value co-destruction as an outcome of customer interactions which depends on the value expectation of individuals. They note that one reason for destruction can be easily caused by another creating risk and negative outcomes. Ertimur & Venkatesh (2010) note that value co-creation is vulnerable to opportunistic behaviours of consumers.

Moreover, Smith (2013:9) notes that value co-destruction happens when the organization fails to offer suitable value propositions for the customer value creation process, failures in co-creating value as in the expected manner through the resource integration process or when customers experience unexpected resource loss (material, leisure, financial, knowledge, self-efficacy, hope etc). Additionally, Laamanen & Skalen (2014) contend that conflicts typically occur due to mismatches between 'perceived' and 'experienced' value, and (non) fulfilment of the customer's value-in-use' by the provider's value propositions. Mele (2011) also expounds the conflicts in value co-creation, recognising five main types of conflicts, namely, task-related conflicts, process related conflicts, role-related conflicts, effective conflicts and value related conflicts. Further, these conflicts can have positive as well as negative impacts resulting in constructive or destructive critical events, while destructive conflicts and unresolved disputes cause damage interpersonal relationships.

Further, literature identifies value co-destruction, and poor service experiences as a result of; misuse of resources (Ple & Cáceres, 2010:434), errors with the service firms and service communities (Worthington & Durkin, 2012), incongruence between the service provider and customer (Echeverri & Skålén (2011), unmanageability of practices (Carù & Cova, 2015), opportunistic behavior (Ertimur & Venkatesh, 2010), high customer involvement (Heidenreich et al., 2015) and disruptive customer behaviours, including misbehaviour of customers (Gursoy et al., 2017).

5.5 Quantitative study: Customer value co-creation/ co-destruction in SSTs

As noted above, although the qualitative study classified the sixteen value co-creation practices into five integrative value practices (5Cs), the quantitative study disregarded this classification, based on the EFA and CFA suggestions and further with the purpose of reducing the complexity of the overall model (the model that explains co-creation intention, practices and experience).

Accordingly, nine elements of value co-creation and six elements of value co-destruction were included in the final model. Linking four individual models necessitated sacrifice of some significant but problematic elements from the final overall model. Value co-creation practices in the final model are represented by seeking information, following instructions, confirming to basic requirements, accepting terms and conditions, taking responsibility, adopting to changes, producing the service, personalising the service and delivering the service. However, as quantitative study found, value co-destructions in SSTs are taken place mainly due to failures in following instructions, producing the service, personalising the service, connecting with the service employees, preventing errors and recovering errors.

The quantitative model primarily examined the effect of customer value co-creation intention in self-service technologies on their value co-creation practices and value co-destruction. Further, recognising the significance of past experience in performing these practices, the quantitative study tested the effect of past experience on both value co-creation and co-destruction.

5.5.1 The effect of customer value co-creation intention on value co-creation practices and co-destructions in SSTs

The quantitative study found that customer value co-creation intention has a strong positive significant effect on customer value co-creation practices ($\beta=0.799$, $p<0.001$) and a significant negative effect on value co-destructions ($\beta=-0.125$, $P=0.043$) in SSTs. Although available literature does not show direct evidence for effects of customer value co-creation intention on co-creation practices in SSTs, there were some similar contexts that explained the effect of intention/acceptance/trial on 'use behaviour' in SSTs/ technologies.

Similarly, Blut et al. (2016) found the effects of attitudes towards using SSTs on usage intention and usage behaviour in self-service technologies. Weijters et al. (2007) found an effect of attitudes towards SST on use, while Dabholkar & Bagozzi (2002); Curran et al. (2003); Curran & Meuter (2005) found attitudes towards technology enabled service adoption. Similarly, Venkatesh et al. (2003); Venkatesh et al. (2012) examined how individuals' reactions towards information technology influence their intention to use technology and actual use of it through the UTAUT model and found significant effects.

With TAM, Venkatesh & Davis (2000); Venkatesh & Bala (2008) found significant effects of behavioural intention on actual use behaviour with technologies. Randall et al. (2011) recognise future intention as an essential element for co-creation take place.

5.5.2 The effect of past experience on customer value co-creation/co-destruction in SSTs

Following the qualitative study outcomes and practice theory, which suggests that 'past experiences' are imperative to make people familiar and less attentive towards practices that they perform on an ongoing basis (Warde, 2005), this study examined the direct effect of past experience on value co-creation practices/co-destruction.

The study found a significant positive effect of customer past experience on their value co-creation practices (β=0.101, p=0.009) and a significant negative effect on customer value co-destruction (β=-0.188, p=0.001). This supports the qualitative finding that pointed to the prominence of past experience in performing value co-creation practices in SSTs, such that people who have had previous experience directly go and use SSTs without hesitation, while others who have not had previous experience are reluctant to do so.

However, since some previous literature such as Demoulin & Djelassi (2016) suggests the effect of experience on adoption/trial/acceptance of technologies, this study proposed an alternative model (alternative model-1) which measures the direct effect of past experience on customer value co-creation intention, and it was found as significant at β=0.079 and $p < 0.05$.

Providing similar evidence to the findings of this study, Demoulin & Djelassi (2016) found a significant influence of previous usage behaviour of SST adoption. Wang et al. (2017) identify prior habit as the most powerful precursor on SST usage, while Castro et al. (2010) recognise previous experience in using SSTs as crucial when the technology is new. Additionally, individual differences (Meuter et al., 2005) and consumer context (Hilton et al., 2013) including their past experience were recognised as important in accepting SSTs. Venkatesh et al. (2003) and Venkatesh & Bala (2008) found experience to be a moderating variable that influences the effects of 'effort expectancy, social influence, facilitation conditions' on technology acceptance.

5.6 Customer value co-creation experience in self-service technologies

This study recognises customer experience in SSTs as mainly composed of functional and emotional elements. Therefore, the 'total customer experience' concept (Berry et al., 2002b; Oswald et al., 2006; Sandström et al., 2008; Lemon & Verhoef, 2016) was used to examine customers' functional and emotional experiences of SSTs. The review of literature found that functional and emotional experiences have been similarly discussed in many scholarly work as 'hedonic vs utilitarian values' (Dennis et al., 2017) and 'extrinsic vs intrinsic values' (Gummerus, 2013). Functional experience is variusly viewd as 'pragmatic experience', (Gentile et al., 2007) 'usability experience'(Kohler et al., 2011), while emotional experience is recognised as 'affective experiences' (Schmitt, 1999) and 'hedonic experiences' etc (Kohler et al., 2011) in the literature. Vargo & Lusch (2008b) highlight 'value-in-use' as the outcome of the value creation process, which is determined by the beneficiary, is very close to 'experience' of co-creation (Gummerus, 2013).

Eleven types of experiences were examined in EFA, while three functional experiences and six emotional experience including three each of positive emotional experiences and negative emotional experiences were remained in the final CFA and structural models. The study examined the direct effect of customer value co-creation practices and co-destruction on customer experience. Consistent with Gummerus (2013), this study also views, experience as the value outcomes of co-creation process.

As noted in the study findings, value co-creation practices show a strong positive significant effect on functional experiences ($\beta=0.780$, $p<0.001$), a moderate positive effect on 'positive emotional experiences' ($\beta=0.328$, $p<0.001$) and a negative effect on 'negative emotional experiences' ($\beta=-0.439$, $p<0.001$). At the same time, customer value co-destruction shows negative effect on customer positive emotional experiences ($\beta=-0.102$, $p=0.025$) and a positive effect on their 'negative emotional experiences' ($\beta=0.374$, $p<0.001$). However, surprisingly, value co-destructions indicated a positive effect on 'functional experiences' ($\beta=0.217$, $p<0.001$).

Consistent with by Füller & Matzler (2007), this study also recognised that customer value co-creation experience in self-service technologies is unique for each individual, since it is an outcome of his/her interaction with SSTs. The same is explained by Vargo & Lusch (2016:8) as value is 'always uniquely and phenomenologically determined by

the beneficiary', as an outcome of their service experience (Rihova et al., 2013). Proving the disparity of customer value co-creation experience, this study found a significant difference in the effect of customer value co-creation practices on functional experiences between the two age groups, such that the effect is stronger among the 18-45 years age group (β =0.861) compared to above 45 years old group (β=0.753) at $\Delta\chi^2$=5.418 and p=0.019. Further, the effect of co-creation practices on positive emotional experiences also was recognised as significantly higher among the 18-45 years age group (β=0.534) compared to the 45 years or above age group (β=0.042) at $\Delta\chi^2$=7.872 and p=.005. Additionally, the effect of co-destruction on negative emotional experience is also significantly different between the two age groups, being stronger among the below 45 years age group (β=0.612) than the above 45 years age group (β=0.282) at $\Delta\chi^2$ =14.736 and p<0.001. It proves that younger people are vital, who feel strong positive emotions with successful value co-creation as well as high negative emotions with value co-destructions, compared to the older people.

As noted above, this study surprisingly found a significant positive effect of customer value co-destructions on their functional experiences in SSTs. Perhaps the reason could be that, even though customers experience value co-destruction in SSTs due to several reasons, they may still believe that SSTs provide functional values such as time saving, cost saving, solutions to busy lives' etc. Such a view is justified in the light of the suggestion by, Bitner et al. (1990) that, when things go wrong in self-service technologies, customers blame themselves fully or partly for the failures and this would be a reason to be less dissatisfied with the service provider. It suggests that customers may not be so much unhappy with the SST performance, as blaming to themselves.

In relation to the functional elements of the experience, Beatson et al. (2006) found SST attributes such as convenience, time savings, low risk and customisation to affect satisfaction. Time-saving, cost-saving, reduced waiting time (Meuter & Bitner, 1998; Beatson et al., 2006) efficiency, flexibility (Bitner et al., 2000) have been interchangeably viewed as functional values/benefits of SSTs. Considine & Cormican (2016) identify functionality in SSTs while Mick & Fournier (1998) explain the possibility of simultaneously experiencing both positive and negative feelings towards new technologies. Zhang et al. (2017) found positive associations between experience and customer engagement in online brand communities.

The ‘emotional experience’ considered in this study has been similarly identified as ‘affective experiences’ (feel marketing appeals) by Schmitt (1999). Adopting the ‘affective experience’ component in customer value co-creation experience was proposed by Schmitt (1999), Gentile et al. (2007) identified an ‘emotional component’ which resonates with the emotional experiences in this study. Similarly, Nambisan & Watt (2011) recognised ‘hedonic experience’ in online communities while Kohler et al. (2011) also viewed ‘hedonic experience’ of customer co-creation in virtual environments. Wiltshier & Clarke (2017) define value experience in virtual cultural tourism to include emotional and functional elements. Parasuraman (2000) points out the evidence of increasing customer frustration of working with technology-based systems.

5.7 Chapter summary

This chapter provided a detailed discussion on the findings presented in Chapter Three (qualitative study findings) and Chapter Four (quantitative study findings). The study found a sequential effect of customer value co-creation intention on their value co-creation practices including value co-destruction and finally their co-creation experience in self-service technologies. As discussed above, the study found a number of elements that influence the customer value co-creation intention in self-service technologies, some of which are moderated by the age and gender. Further, the study found a set of customer value co-creation practices and co-destructions in SSTs that are inter-connected, such that success or failure of one practice may connect with another, resulting in overall success or failure in the value creation process.

Apart from that, this study reveals customer co-creation experience in self-service technologies, exploring both functional and emotional elements of the experience. Finally, the study outcomes were compared with the available literature, with critiques and explanations.

CHAPTER SIX

CONCLUSION

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CONCLUSION

Introduction

This chapter commences with providing a summary of the key findings and conclusions drawn from the study. It is followed by discussing the theoretical contributions and managerial implications of this research as proposed by Corley & Gioia (2011) and MacInnis (2011). Finally, the limitations of the study are discussed, along with future research directions.

6.2 Summary of the study

This study aims at bridging four key research gaps identified in the value co-creation scholarly work namely, 1. the neglect of value co-destruction, 2. being limited to understanding the organisation's perspective in co-creation, 3. disregarding technological interfaces as a platform in value co-creation and 4. not having enough investigations on identifying proper theoretical foundations and analytical dimensions of value co-creation. In an effort to bridge the above identified gaps, this research focused on examining both the value co-creation and co-destruction taking place at technological interfaces (self-service technologies) from the view-point of the customer, based on the foundations of practice theory.

Against such a backdrop, the study aimed to achieve three main objectives, to understand: 1. customer value co-creation intention, 2. value co-creation practices (both co-creation and co-destruction) and 3. value co-creation experiences in self-service technologies. Finally, a comprehensive conceptual model for SSTs was developed to explain the sequential effect of customer value co-creation intention, practices and experiences with empirical validations.

Given the paucity of available research work on value co-creation at technological interfaces and the necessity of both exploratory and confirmatory approaches in producing comprehensive contributions, this study used a mixed methodology approach, based on the sequential exploratory strategy, in which a qualitative study was followed by a quantitative study. The qualitative and quantitative studies used respectively, semi-

structured interviews and a field survey to collect data, and thematic analysis and structural equation modeling with AMOS to analyse data.

The qualitative study found 45 individual elements, which were later re-classified into eight determinants of customer value co-creation intention: performance, convenience, technology know-how, emotional reactions, personal judgements, social influence, information richness and situational factors. The quantitative study found, technology know how, performance, information richness and situational factors to have significant positive effects on customer value co-creation intention, with technology know-how being the strongest predictor. Convenience and social influence were also significant, with the moderating effect of age and gender such that convenience has a stronger effect for the younger age group (below 45 years) and social influence has negative effects for males and positive effects for females.

Further, the qualitative study recognisesd sixteen types of customer value co-creation practices in self-service technologies. These practices were grouped into five integrative practices (5Cs): Co-learning (seeking information, sharing information, recalling information, following instructions, providing feedback), Co-production (producing the service, personalizing the service, delivering the service), Co-operating (conforming to requirements, accepting terms and conditions, taking responsibility, changing habits, tolerating problems), Connecting (connecting with service employees) and Correcting (preventing errors and recovering errors). Value co-destruction was recognised as an alternative outcome of these same practices. However, considering the interconnectivity among variables and further, with the aim of reducing the model complexity, the quantitative study recognised each single factor for value co-creation and co-destruction disregarding the above classification.

According to the findings, customer value co-creation intention and past experience show significant positive effects on customer value co-creation practices and significant negative effects on customer value co-destruction in SSTs. Value co-creation practices show a strong positive effect on customer functional experiences and ‘positive emotional experiences’ while having negative effect on ‘negative emotional experiences’. In contrast, co-destruction shows inverse relationships, with a positive effect on ‘negative emotional experiences’ and negative effect on ‘positive emotional experiences’. However, a significant positive effect of co-destruction was found on functional experiences.

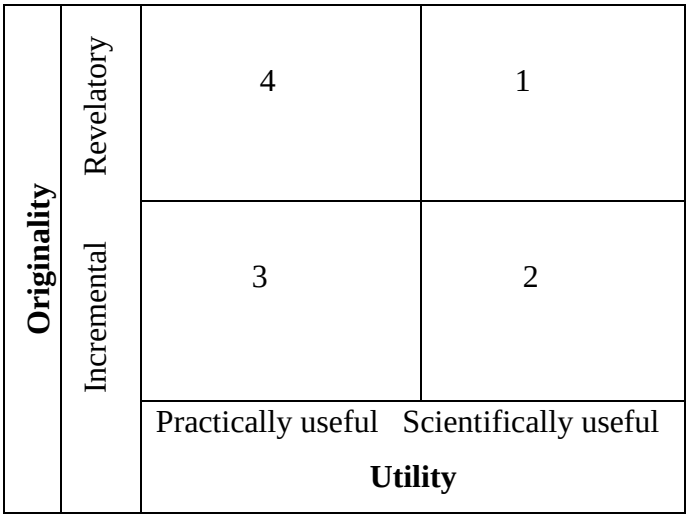
Finally, a significant positive effect of functional experiences was found on positive emotional experiences in SSTs.

6.3 Research contributions

This study reports its contribution, elaborating theoretical contributions and managerial implications using the frameworks proposed by Corley & Gioia (2011) and MacInnis (2011).

Corley & Gioia (2011:16) suggest main two perspectives of a research contribution termed originality and utility. Two types of 'originality perspective' are discussed as "1. advancing understanding incrementally (incremental contributions) and 2. advancing understanding in a way that provides some form of a revelation (revelatory contributions). The 'utility perspective' of a research is viewed as 'practical usefulness' and 'scientific usefulness', as illustrated in the following figure.

Figure 6. 1: Dimensions of theoretical contribution



Source: Corley & Gioia (2011:15)

The following describe the contributions of this research in line with the Corley & Gioia (2011) framework.

6.3.1 Theoretical contributions of the study

"The mission of a theory development research is to challenge and extend the existing knowledge" (Whetten, 1989:491). Hence, the value added contribution can be primarily incremental or revelatory (Corley & Gioia, 2011).

As the existing literature suggests, the history of value co-creation has been largely limited to traditional physical boundaries, while very few studies have focused on technological interfaces in value co-creation (Hilton et al., 2013). Therefore, moving out from the widely held tradition of understanding co-creation as a dyadic interactive process that happens in physical boundaries, this study focused on examining how value co-creation takes place at technological interfaces. In this way, this study resolved a vital gap in previous research work that confined itself to physical interfaces (Hilton et al., 2013). Although value co-creation practices in physical interfaces such as healthcare (McColl-Kennedy et al., 2012), transportation (Echeverri & Skalen, 2011), branding (Schau et al., 2009; Carù & Cova, 2015), hospitality sector (Camilleri & Neuhofer, 2017), B2B context (Kohtamäki & Rajala, 2016), professional services (Ng et al., 2016) etc have been uncovered, recognizing the customer value co-creation practices in technological interfaces is very rare, in particular, in self-service technologies it has not been revealed yet. Therefore, this study adds new knowledge to marketing theory by revealing customer 'value co-creation practices' in self-service technology context for the first time. As Corley & Gioia (2011) suggest, this input can be recognised as a '**revelatory contribution'** from the originality perspective, since it puts forward a radical step towards understanding value co-creation at self-service technologies and especially exploring customer value co-creation practices in SSTs.

As Corley & Gioia (2011) suggest, this study contributes to '**scientific utility'** in numerous ways by delivering new knowledge and developing new models/ typologies to the SST context.

First, this study discovers customer value co-creation intention in self-service technologies, recognising the influencing factors. Although a number of previous research works have focused on SST acceptance/trial/adoption using general technology acceptance models such as TAM, UTAUT etc, these models were recognised as not particularly explaining the SST context (Blut et al., 2016). Noticing the lack of comprehensive models that explain customer intention of collaborating with self-service

technologies, this study explored the factors that determine customer value co-creation intention and developed a valid model during the qualitative and quantitative stages in the study respectively. Comparing to the general technological acceptance models and specifically to the model recently developed by Blut et al. (2016) which particularly explains SST acceptance, this study reveals the significance of 'situational factors', 'technology-know-how', 'convenience' and 'information richness' in customer co-creation intention in SSTs.

Second, based on the qualitative study findings on customer value co-creation practices, this study develops a typology, to better comprehend the customer value co-creation practices in SSTs. This is done by re-classifying the sixteen value co-creation practices into five main integrative groups of practices (5Cs) as co-learning, co-producing, co-operating, connecting and correcting. This can be considered as another contribution to the marketing theory, to view customer value co-creation in technological interfaces from an integrative value practices perspective.

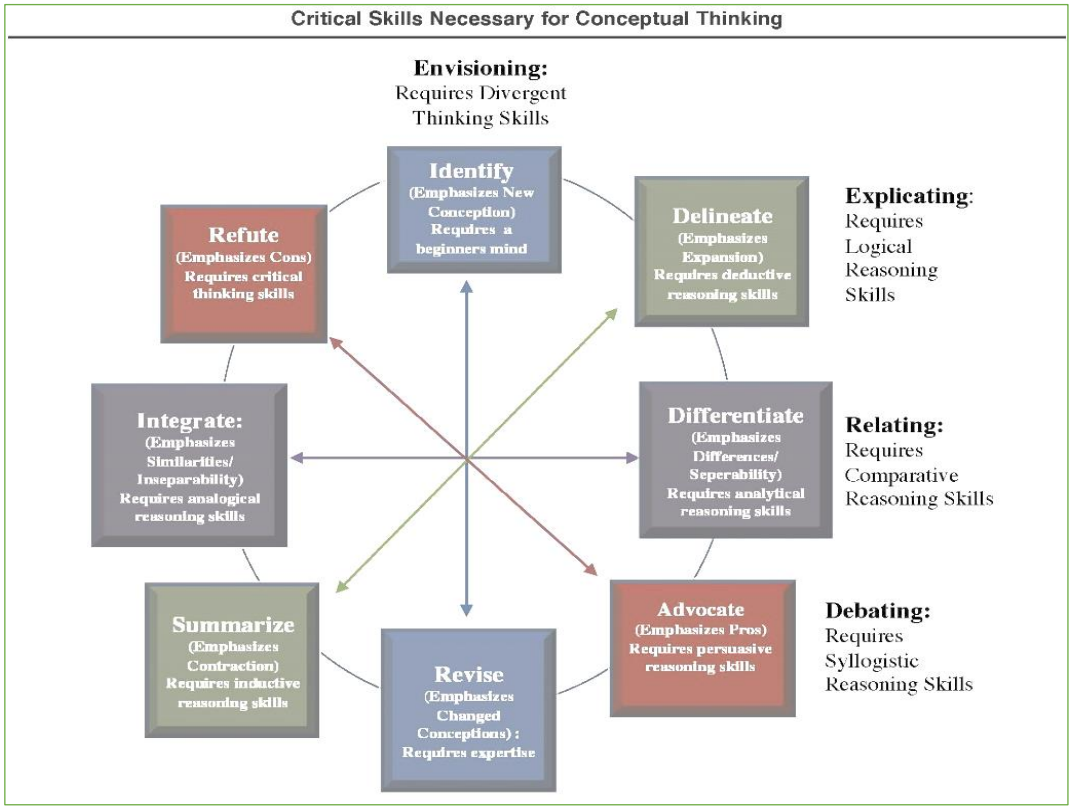
Third, the study reveals customer value co-creation experience in self-service technologies from the 'total customer experience' perspective, understanding both functional and emotional elements of experiences. Further, the study proves that the effects of customer value co-creation practices/ co-destructions on customer functional and emotional experiences are moderated by age with these effects typically being weaker for older people.

Finally, a comprehensive conceptual model has been developed, expounding the sequential effects of customer value co-creation intention, practices (including co-creation and co-destruction) and experience in self-service technologies, which can be extended to any technologically supported services. This conceptualisation is open for further improvements, customisation and empirical validation in different types of technologies or cultural/ geographical settings. By providing such contributions, this study overcomes the methodological gap identified in previous research works in value co-creation, of being limited to qualitative studies and not provided analytical measurements.

This study also makes some **'incremental contributions',** enriching the literature in well-established bodies of knowledge in value co-creation, practice theory, and self-service technology and customer experience contexts.

Apart from Corley & Gioia (2011) framework, this study draws on MacInnis (2011) who elaborates conceptual thinking in recognising research contributions, specifically to the marketing discipline. As illustrated in the following figure, this framework consists of four types of contribution: "envisioning new ideas, relating ideas, explicating ideas and debating ideas" with two sub types that contribute to the "process of discover or to the process of justifications" (MacInnis, 2011:136). The contributions of this study according to MacInnis (2011) framework are discussed here.

Figure 6. 2: McInnis (2011) framework for research contributions



Source: MacInnis (2011:140)

According to McInnis's framework, this research specifically contributes to the domain as follows.

- **Identifying**: Identifying refers to "seen that something exists; to apprehend, notice, or behold" and making people aware of what have been missing and why it is important'(MacInnis, 2011:138). This study points out a serious weaknesses of past value co-creation studies being limited to physical interfaces by examining mainly direct dyadic interactions.Against this backdrop, this study contributes to fill this research gap by identifying 1) why customers co-create value in SSTs

(customer value co-creation intention), 2) what customers do in co-creating value (customer value co-creation practices including co-destructions) and 3) how customers evaluate their co-creation (customer value co-creation experience) in self-service technologies.

- **Revising:** Revising is defined as "to see something that has been identified in a new way; to reconfigure, shift perspectives, or change" (MacInnis, 2011:138). As noted above, the history of co-creation literature has been overly limited to recognize 1) dyadic interactions at physical interfaces (Hilton et al., 2013), 2) only value co-creation (disregarding co-destructions) (Ple & Cáceres, 2010), 3) from the organizational perspective (Heinonen et al., 2010; Fisher & Smith, 2011). Revising the widely held tradition, this study explores value co-creation including co-destruction taking place in technological interfaces from the viewpoint of the customer.

- **Delineating**: It denotes "to detail, chart, describe, or depict an entity and its relationship to other entities" (MacInnis, 2011:138). In the qualitative stage, the study explored why and how customers co-create value in self-service technologies and based on that, it delineated separate conceptual frameworks to explain customer value co-creation intention and their value co-creation practices in self-service technologies, with empirical validations. Finally, the study presented a comprehensive conceptual framework which explains customer intention, practices and experience of value co-creation in self-service technologies in a single platform. Further, the study presents a typology to explain five types of integrative customer value co-creation practices (5Cs) in self-service technologies.

- **Summarizing**: The study contributes to the existing literature by summarising the previous scholarly contributions on value co-creation, self-service technologies and customer experience contexts and identifying the gaps which need immediate attention by contemporary researchers. Further, as MacInnis (2011) suggests, this study concludes by providing valid conclusions and developing research priorities and directions for future studies.

- **Differentiating:** Differentiating refers "seeing types of things and how they are different; to discriminate, parse, or see pieces or dimensions that comprise a whole" (MacInnis, 2011:138). This study differentiates its understanding of customer value co-creation and co-destruction from the practice theory perspective, pointing out how the same value practice (eg: following instructions) could cause one party to create value and another party to destroy value. Apart from that, the study distinguishes the functional and emotional nature of the customers' value co-creation experiences in SSTs. Finally, this study distinguishes how the main effects of customer value co-creation intention and experiences are influenced by customer demographics such as age and gender.

- **Integrating:** It is defined as "to see previously distinct pieces as similar, often in terms of a unified whole whose meaning is different from its constituent parts; to synthesise, amalgamate, or harmonise" (MacInnis, 2011:138). Addressing a gap existing in past studies, this research integrates the customer value co-creation intention, practices and experiences together to obtain a holistic view of customer value co-creation in self-service technologies.

- **Advocating:** Advocating means "to endorse a way of seeing; to support, justify or suggest an appropriate path". This study clearly states the issues prevailing in the previous value co-creation studies and resolves them by filling the gaps in the literature. Further, the study informs the business organisations on why customers select SSTs, what they do in collaborating with SSTs and how customers evaluate their experience with SSTs. This understanding provides numerous opportunities for business organisations to manage their self-service technological interfaces to achieve greater competitive advantages and customer satisfactions.

- **Refuting**: This study challenges the previous view of restrictively seeing co-creation from an interpersonal interaction view point, showing how value co-creation in technological interfaces takes place at arm's length without the presence of service employees through the 'institutional arrangements' (Vargo & Lusch, 2016) provided by the respective institutions (eg: ATM provided by bankers).

6.3.2 Practical utility of the study / Managerial Implications

As Corley & Gioia (2011) suggest, this study contains important practical utility that provides managerial implications. This practical utility is discussed under the following sub topics.

6.3.2.1 Customer value co-creation intention in SSTs

First, the study provides a broad understanding to service providers on why (reasons) customers collaborate with self-service technologies. The qualitative study provides strong evidences on how performance, convenience, technology-know-how, information richness, situational factors, social influences and customers' emotional reactions and personal judgements influence their intention of value co-creation in SSTs. Among them, performance, technology-know-how, information richness and situational factors were suggested by the quantitative study as highly significant in customer value co-creation intention, while the effects of convenience and social influences were viewed as significant with the moderating effects of age and gender respectively.

Service providers can take various steps to increase customers' intention of using SSTs by improving their self-service technologies to match with customer expectations. This study finds that '**performance**' can be enhanced by improving the usefulness, speed, efficiency, consistency, cost-effectiveness, user-friendliness, reliability and trialability. In particular, this study finds that customers expect quick performance from SSTs without wasting their time and effort, and typically they select SSTs when the physical interfaces are crowded or when they are in a hurry (situational factors) with the purpose of saving their time (eg: self-checkouts at supermarkets). Therefore, organisations should make sure their SSTs are up-to-date and performing rapidly without any technological delays or failures. Further, this study found customers expect a 'consistent' service from SSTs, such that they can use their existing knowledge and experience in a routinised way to perform similar kinds of SST transactions without hesitations (e.g.; similar kinds of self-service checkouts at different supermarkets). Therefore, this study suggests that service firms to secure the consistency of SST service performance, ensuring customer ability to use their existing knowledge and skills in continuing basis. This does not mean not making any improvements to the SSTs, but to make these developments in such a manner that customers could feel more comfortable than they did before.

Further, by recognising '**information richness'** including sufficiency, timeliness, relevance, accuracy, clarity, consistency, simplicity of information/instruction as important in customer value co-creation intention in SSTs, practitioners can achieve greater competitive advantages by providing and upgrading their self-service technologies to incorporate these qualities, thereby promoting successful customer value co-creations and positive experiences. For example, respondents revealed that sometimes information available in organisation's web sites are not up to date, terms and conditions are hidden or not very clear, and some confusing instructions invite problems. Some respondents complained that the information available is not sufficient to elicit the most correct decisions, and thereby leading to value co-destructions. Addressing such issues, this study recommends that service organisations exert some extra efforts in managing their websites and other technological interfaces, to provide up to date, clear, accurate, simple and relevant guidelines/information to aid successful performance of value co-creation in SSTs. Further, this study suggests that service organisations provide sufficient information and full details on their offers, since customers have to make their choice in the absence of the service provider's verdict.

The study found the significance of **'technology-know-how'** including customers' general knowledge on SST devices, computer knowledge, internet knowledge, ease of gathering this knowledge and ease of using SSTs. Therefore, the study recommends that organisations assist customers in enhancing their technology know-how by disseminating awareness of easy ways of interacting with the organisation's technological interfaces, promoting few-stepped processes with easy to recall approaches with visual demonstrations (e.g. click-choose-confirm-pay) and promoting the benefits of using self-service technologies. Further, this study advises service organisations to consider the customer's technology-know-how, especially at the stage of designing their SSTs, such that typical customers (not only technology experts) can use them with minimum effort.

Situational factors such as crowding at physical interfaces and hurriedness of the customer are recognised as vital in SST use. Therefore, if business organisations are not providing self-service technologies at all or not offering enough technological interfaces, this study recommends them to facilitate customers with enough self-service technological options, if possible, so they can perform with SSTs, especially in the above identified situations.

However, qualitative and quantitative studies found that **age** is significant in value co-creation, such that older people are reluctant to perform with self-service technologies. Therefore, service providers should not neglect that segment of the market in their service provision and should make sure that they provide options to perform service transactions in physical interfaces, without forcing them to use SSTs.

Further, the study found that **convenience** factors, including 'time convenience, place convenience and less physical efforts', are important in customer value co-creation intention, especially for the younger people while **social influence** has negative effects for males and positive effects for females. It also provides insights on how to promote the organisation's self-service technologies to different demographic segments, based on what they value.

Although customers' **emotional reactions** and **personal judgments** are not included to the final conceptual model, the qualitative study found that, while younger people love and enjoy SSTs, some older people feel fear and guilt towards SSTs. The guilty feeling towards SSTs is mainly due to the facts that it causes loss of job opportunities and reduces inter-personal interaction, making customers more isolated. Further, while the majority of young people trust SSTs, some older people see it as a risk and a threat to their privacy. While young people believe SSTs make them more independent, older people view it as making them more isolated. The majority of younger people appeared as ready and confident to use SSTs while the opposite was recognised among the older people. Everyone believed SSTs are still voluntary, and organisations are providing options to choose between SSTs or interpersonal interactions. These insights will be helpful to business organisations to explore how they can make their different demographic profiles happy with their service. Further, this understanding can be used to initiate awareness programmes on reducing poor attitudes towards organisations and their technologies by promoting positive views such as how they help to enhance the wellbeing of individuals and society rather than being associated with negative impacts.

6.3.2.2 Customer value co-creation practices/ value co-destructions in SSTs

This study explores what customers do or which kind of activities customers practice in co-creating value in self-service technologies (value co-creation practices). As noted above, the qualitative study finds sixteen value co-creation practices in SSTs, whereas the

quantitative study identifies nine as appropriately modelling with co-creation intention and experiences. Further, the study finds that some of these practices are interconnected with each other, such that success or failure in performing one practice affects to another, resulting in overall value co-creation or co-destruction. Therefore, service providers should take necessary steps to assist customer value co-creation practices by managing their self-service technological interfaces in a user-friendly manner, since customers often perform these practices by themselves, without a support or presence of the organisation's employees.

For example, both qualitative and quantitative studies found that 'seeking information' and 'following instructions' as important practices that customers often need to perform in SSTs. Through the effective management of sources of information/instructions such as websites, SST screens, keyboards and audio/visual elements attached to SSTs, service providers can effectively enhance customers' ability of self-performing these practices.

This study found 'providing feedback' as very rare practice in SSTs, which largely limited to report when customers feel extreme conditions such as being delighted or desperately dissatisfied. Consequently, through a traditional feedback system (eg: questionnaire), the organisation will not be able to capture the voice of the majority of typical customers. Therefore, this study suggests 'quick feedback' system with SSTs such as pressing a button with a happy, sad or angry face that indicate the customer's service experience or giving marks for a single question on a scale from one to ten rating the service experience. Further, the study found that, not receiving an answer to customers' feedback/complaints is a reason for them to cease providing such feedback. Therefore, this study advises service organisations to provide on the spot solutions or fast reactions for customer complaints/feedback.

Further, 'connecting' with service employees, especially in situations where customers face problems in performing in SSTs, was recognised as important value co-creating practice in SSTs. As respondents noted in the qualitative study and replicates through the quantitative findings, it was recognised that, even though 'connecting' is not a frequent practice in SSTs, inability to connect to a responsible service employee when needed makes customers more annoyed and stressed and finally creates negative emotional experiences. Therefore, this study strongly recommends service providers to provide personalised solutions to customers, especially when they face problems with self-service

technologies, rather than providing another standard self-service technology-based solution through automated voice recordings. Simply connecting the call (customer grievances) to a service employee to provide personalised solution can create a very positive attitude in the customer's mind, rather than neglecting their problems asking them to listen to an automated voice response, wasting their time and effort. Therefore, this study recommends service organisations to manage proper 'customer support service', to educate customers on their SSTs and support them when they need any assistance, especially at the stage of recovering errors through 'connecting' and 'correcting'.

Customer collaborations in producing, personalising and delivering the service are recognised as important in service co-production in self-service technologies. Some of the respondents note that personalisation via SSTs makes the process more complex. It would be beneficial to customers if organisations could provide more clear stepwise guidance and instructions on how to perform/personalise the service via self-service technologies. The organisation can take extra efforts to make sure that customers service production in SSTs takes place smoothly by operating customer service staff members, self-help options, customer service call centres and/ or evaluating the customer service experience through different mechanisms such as 'quick feedbacks, as suggested above.

Finally, 'preventing errors' and 'recovering errors' are recognised as significant 'error correcting' practices in self-service technologies. Therefore, the study suggests that business organisations aid customers' error prevention practices by making them more aware of possible errors by indicating them through warning messages, red lights, underlining the warnings in red, highlighting the important information/conditions in an eye catching manner, obtaining confirmation for the second time for important information and asking the customer's conformation before the final decision etc. Finally, although the customer goes through these all processes, if he/she does not want to pay and continue the service transaction, there should be an easy process to 'cancel' or 'exit' the process without any conditions. However, if the customer/organisation is unable to prevent failures, as the next step, the organisation should provide proper 'recovery' strategies, such as simple apologies, quick replies to calls/emails, refunds, product-to-product etc without any delays. Further, it is advisable for organisation to confirm the customer's preferred method of service recovery strategy. This is because, many service organisations use 'product-to-product' as the error recovery strategy, but this takes

considerable time, whereas the customer might prefer to obtain a similar product/ service from another service provider for immediate satisfactions.

6.3.2.3 Customer value co-creation experience

The study improves understanding of the customer value co-creation experience in self-service technologies, elaborating both the functional and emotional elements. Further, the study explains how customer value co-creation practices and value co-destructions affect their experiences. The findings show the positive effects of customer value co-creation practices on both functional and emotional experiences while co-destructions negatively affect customer emotional experiences. Accordingly, customer value co-destructions in SSTs cause customers to feel bored, stressed and lonely. This understanding provides an awareness for practitioners on which grounds that they should reduce or eliminate value co-destructions, by enhancing and guaranteeing the customer's positive experiences. Further the study found that younger people are very sensitive for SST performance, such that they are being pleased with successful value co-creation and being very annoyed with the value co-destructions than the older people. Therefore, managing such a group to secure positive emotional experience is a challenge to organisations, which can be achieved through properly identifying and remedying reasons for value co-destructions.

To sum up, this study assists practitioners to comprehend why customers collaborate with SSTs, what they do in co-creating value and how this links with their experience. Service providers can use this understanding to facilitate customer co-creation by securing positive customer experiences and achieving competitive advantage by designing and delivering value enhancing self-service technological interfaces from both strategic and operational perspectives.

6.4 Limitations of the research

This study provides an overall picture about the value co-creation intention, practices and experiences of self-service technologies. However, as the qualitative study pointed out and recent literature notes (Blut et al., 2016), these findings may vary slightly with the types of SSTs; mainly whether they are online/internet-based SSTs, telephone-based SSTs, interactive kiosks and CD/DVD based SSTs. Although this study collected data on customer frequency of usage of different SST types (the first questions in the

questionnaire), that data was not enough to perform comparative analysis for different types of SSTs.

Further, this study was geographically confined to the United Kingdom (in the developed context). As Lee (2016) notes, the findings may slightly vary in different geographical or cultural settings, especially between developing and developed contexts.

As another limitation, this study used the same data set for both exploratory and confirmatory factor analysis. As Hair et al. (2013) note, the findings may be stronger, if different data sets could be used for these analyses. Further, the common method bias also could be solved to a greater extent, if the data relevant to dependent and independent variables were collected from different sources of respondents. However, due to the time and financial limitations, this study was confined to a single data set.

Although this study conducted a multi group analysis based on the age of the respondent, a clear cut-off for young and old could not be made, since the older population (above 65 years) were represented by a small number (only 8) in this study. Therefore, the median/mean age (45 years) was taken as the cut-off for the two groups. Since the above 45 years old group does not represent the older population, slightly different results might have been obtained if the older population had been properly represented in the sample.

As noted in the literature, the findings can be generalised to a greater extent, if the sample selection is based on random sampling method. However, this study used non-probabilistic snowball sampling. Unavailability of a sampling frame for random selection and the greater convenience associated with snowball sampling in achieving a sufficient sample size were the main motives for this decision.

6.5 Future research directions

This study provides future research directions based on the theoretical and practical limitations of the current study and the identified gaps in the theory (literature) and practice in value co-creation in SSTs.

First, this study explores customer value co-creation in common self-service technologies. However, as the qualitative study witnessed, the findings may differ slightly with different types of SSTs. Therefore, there are avenues for future studies to focus on specific

types of SSTs, for instance, telephone/interactive voice technologies or interactive kiosks etc., and explore customer value co-creation in detail, or perform as a comparative analysis.

Second, as this study recognises, value co-destruction in self-service technologies is very common, yet focus of scholarly work on it is rare. Further, as this study reveals, customer value co-destruction negatively affects customer emotional experiences. Therefore, converting business processes into technological based advanced operations could be a long-term cost to organisations, causing the loss of loyal customers. Based on this foundation, this study recommends exploring customer value co-destruction in SSTs in detail, especially 1. why value co-destruction takes place, 2. how it happens, 3. how customers feel/experience such situations, and 4. how such value co-destruction affects customer loyalty/word-of-mouth communication etc.

Third, this study investigated value co-destruction from a practice theory perspective, with the aim of understanding how performing value creation practices in SSTs can result in value co-destructions. However, customer misbehaviours such as frauds and cheating are evidenced in self-service technologies. Therefore, it is worth exploring how such customer misbehaviours cause value co-destructions particularly to the service provider, other customers and/or other parties in the service system. This could be a study of discourse analysis of exploring available evidences in websites, newspapers etc, since other methods such as questioning is not a reliable and ethical source to understand misbehaviours of the customers. Additionally, it would be worthwhile to extend that understanding to investigate prevention mechanisms of customer misbehaviours in SSTs.

Fourth, this study found error prevention and recovering are important in 'correcting' service failures in SSTs, and most of the respondents are unhappy with the poor error recovery strategies provided in SSTs. Therefore, it is worthy to investigate specially on, 1. error prevention and recovering opportunities in SSTs, 2. customers' role vs organisation's role in prevention and recovering errors, 3. customer preferences vs organisation commitments in recovering errors and its effects on future value co-creation intention/practice in SSTs.

Fifth, this study witnessed that information seeking, following instructions etc are the starting point of many SST value co-creation activities, such that inabilities in performing these initial practices cause failures in other interconnected practices, finally resulting in

value co-destruction. Therefore, if organisations assist customer learning, it could reduce value co-destruction in SSTs to a greater extent. On this basis, this study recommends for future researchers to focus on investigating customer 'co-learning' in self-service technologies elaborating more on their self-learning and experience-based learning. Experiential learning theory and self-directed learning theory would provide a theoretical foundation for this understanding.

Sixth, this study views co-creation capabilities and experiences as varying mainly with the age of the customer, especially between the younger and older generations. Although previous research work, as well as this study found such difference, the representation of the older population was not substantial enough in the sample. Therefore, it would be worth pursuing further studies to understand value co-creation intention, capabilities and experiences among older populations, since they are unexploited by many studies.

Finally, since the study context is limited to the United Kingdom, representing the developed context. Therefore, it would be worthwhile to see whether customer value co-creation in self-service technologies vary in different geographical contexts such as developing vs developed countries, or different cultural settings.

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ANNEXURES

Annexure i: Ethical approval letter from University of Hull

UNIVERSITY OF Hull

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Ref: HUBSREC 2015/64

16 June 2016

Dear Badra

Re: Value co-creation and total customer experiences at self-service technologies

Thank you for your research ethics application.

I am pleased to inform you that on behalf of the Business School Research Ethics Committee at the University of Hull, Dr Stephan Dahl has approved your application on 16 June 2016.

I wish you every success with your research.

Yours sincerely,

Hilary Carpenter
Secretary,
Research Ethics Committee

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Accredited by Association of MBAs

Annexure ii: Participant information sheet (Qualitative Study)

UNIVERSITY OF Hull

Dear Participant,

I am Badra Sandamali Galdolage, a PhD Student at Hull University Business School, conducting a research on value co-creation and customer experience in self-service technologies.

Participation in this study is voluntary. It will take approximately 20 minutes in length and take place in a mutually agreed upon location. You may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With your permission, the interview will be audio recorded to facilitate collection of information, and later transcribed for analysis. All information you provide is considered strictly confidential. Your name will not appear in any thesis or report resulting from this study, however, with your permission anonymous quotations may be used.

If you are willing to take part in the study, you will be asked to sign a form giving your permission and signing the consent form does not mean you must take part. Even if you agree now, you can change your mind without giving any reason.

Should you have any concerns about the conduct of this research project, please contact the Secretary, HUBS Research Ethics Committee, University of Hull, Cottingham Road, Hull, HU6 7RX; Tel No (+44) (0)1482 463536.

Thank you very much for your time and cooperation. I greatly appreciate your help in furthering this research endeavour.

Sincerely

Badra Sandamali Galdolage
Student in PhD in Marketing, Business School, University of Hull
Email : b.s.galdolage@2015.hull.ac.uk

Annexure iii: Consent form

UNIVERSITY OF Hull

CONSENT FORM FOR PARTICIPANTS

I,……..of ……
……...

Hereby agree to participate in this study to be undertaken By **Badra Sandamali Galdolage** and I understand that the purpose of the research is to explore customers' view, practical use and their experiences about the use of self-service technologies in generating services.

I understand that,

i. Any information that I provide will not be made public in any form that could reveal my identity to an outside party i.e. that I will remain fully anonymous.

ii. Aggregated results will be used for research purposes and may be reported in academic publications.

iii. Individual results will not be released to any person except at my request and on my authorization.

iv. I am free to withdraw my consent at any time during the study in which event my participation in the research will immediately cease and any information obtained from me will not be used.

Signature: ……. Date:……..

The contact details of the researcher: Mobile 07438776182
E-mail: b.s.galdolage@2015.hull.ac.uk
The contact details of the Supervisor: E-mail: c.jayawardhena@hull.ac.uk

Annexure iv: Discussion guide for the qualitative study

UNIVERSITY OF Hull

Introduction

a. Self introduction of the interviewer

b. Explain the purpose of the meeting

c. Explain the purpose and objectives of the study

d. Introduce examples for Self-Service Technologies

Telephone/Internet Banking	Self-check-in at airports
Distance Learning	Self-service fuel pumps
Automated airline ticketing	Self-scanning at retail shops
Self-checking/checkouts at hotels	On line car rentals, insurance policy designing
Self-checkout at supermarkets	On line shopping, ordering and purchasing
Automated teller machines (ATM)	Blood pressure monitors
Self-service Kiosks	Order status checking/package tracking online/TP
Vending machines	CD/DVD based learning/ entertainment

Customer Value co-creation intention

i. Which kinds of self-service technologies are you using?

ii. What do you feel / think about self-service technologies?

iii. How SSTs practically useful to you? / Which kind of benefits do you receive with SSTs?

iv. Are there any special reasons behind your choice of self-service technologies?

v. How do you evaluate self-service technology options compared to your interactions at physical service environment with organization employees?

vi. According to your view, as a customer, which kind of capabilities should you possess in doing such transactions with SSTs?

vii. Do you think that your involvement with SSTs is optional? Or mandatory? In which situations?

viii. Which kind of qualities/characteristics do you expect from self-service technologies?

Customer value co-creation practices

i. How do you practically involve with the organization through SSTs? Which kind of things you have to do when you dealing with SSTs?
ii. Do you think that SSTs allow you to personalise the service as you wish… can you provide examples?
iii. Have you experienced any failures in services of SSTs? Could you please share such experiences? According to your view, what would be the reasons for such failures?
iv. Do you agree with basics /guidelines /instructions given by the SSTs? Are they enough to perform tasks by yourself?
v. Could you manage the service by your own? / Can you monitor your service throughout the transaction? Are you willing to get the responsibility over transactions?
vi. Accidentally if you do something wrong, are there any possibilities to further deal with the firm to make it correct? Have you experienced such?
vii. Do you have any opportunities to learn through company SST resources and giving feedback for them?

Closing phase

a. Check to see if all necessary areas are covered
b. Any additional information
c. Any question
d. Thank the participant

Annexure v: Questionnaire for the quantitative data collection

UNIVERSITY OF Hull

Dear sir/madam,

This questionnaire is about your intention, use and experience of self-service technologies (SSTs): technologies provided by organizations, specifically to enable you to engage in self-service behaviors.

The survey will take approximately15-18 minutes. Please circle the corresponding box which is relevant to you, within the given options/statements. There are no right or wrong answers and therefore answer the questions to the best of your knowledge. All responses you provide will be confidential and will only be used for the academic purposes. Thank you very much in advance for your time and helping me with my studies.

For any inquiries please contact one of the following,

Student: Badra S. Galdolage
The Business School
University of Hull
b.s.galdolage@2015.hull.ac.uk

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SECTION - A

This section evaluates how people use self-service technologies (SSTs). Please read the following types of SSTs, and circle the options, which best explain your frequency of usage.

		Never	Rarely	Sometimes	Often	Always
1	Telephone Banking	1	2	3	4	5
2	Order status checking via telephone	1	2	3	4	5
3	Customer service call centres	1	2	3	4	5
4	Information (self-help) telephone lines	1	2	3	4	5
5	Online banking (financial transactions)	1	2	3	4	5
6	Online shopping	1	2	3	4	5
7	Package tracking	1	2	3	4	5
8	Online information search	1	2	3	4	5
9	Self-management of utility bills (Gas/water/electricity)	1	2	3	4	5
10	Distance learning	1	2	3	4	5
11	Automated Teller Machines (ATMs)	1	2	3	4	5
12	Automated check ins/checkouts at air ports/ hotels	1	2	3	4	5
13	Self-service fuel pumps	1	2	3	4	5
14	Car parking payment machines	1	2	3	4	5
15	Self-checkouts at supermarkets	1	2	3	4	5
16	Vending machines (products/ tickets etc)	1	2	3	4	5
17	Blood pressure monitors	1	2	3	4	5
18	Software or calculators on tax, mortgage, BMI	1	2	3	4	5
19	CD/DVD/TV based self-learning	1	2	3	4	5
20	Other (Please Specify)	……				

SECTION - B

The following statements are about SSTs in general. Please indicate the extent to which you agree or disagree with the following statements by circling the appropriate number.

		Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
01	I find SSTs are useful in my daily life	1	2	3	4	5	6	7
02	SSTs are quick in performing tasks	1	2	3	4	5	6	7
03	Using SSTs increases efficiency	1	2	3	4	5	6	7
04	SSTs provide a consistent service	1	2	3	4	5	6	7
05	Working with SSTs is economical	1	2	3	4	5	6	7
06	SSTs are user friendly	1	2	3	4	5	6	7
07	SST transactions are reliable	1	2	3	4	5	6	7
08	I can use SSTs on trial basis to see what I can do	1	2	3	4	5	6	7
09	SSTs fit well with the way I like to get things done	1	2	3	4	5	6	7
10	Learning to operate SSTs is easy for me	1	2	3	4	5	6	7
11	I find SSTs are easy to use	1	2	3	4	5	6	7
12	I can use my own convenient time when I work with SSTs	1	2	3	4	5	6	7
13	Less physical effort is required in performing SST transactions	1	2	3	4	5	6	7
14	SSTs allow me to work in a place convenient to me	1	2	3	4	5	6	7
15	I have the necessary technical knowledge to use SSTs	1	2	3	4	5	6	7
16	I have the necessary computer knowledge	1	2	3	4	5	6	7
17	I have the necessary knowledge on internet	1	2	3	4	5	6	7
18	I love SST transactions	1	2	3	4	5	6	7
19	I feel performing SST transactions is a risk	1	2	3	4	5	6	7
20	I have self-control over my SST transactions	1	2	3	4	5	6	7
21	I feel guilty of using SSTs (eg: it can lead to a reduction of the number of jobs)	1	2	3	4	5	6	7
22	I enjoy interacting with SSTs	1	2	3	4	5	6	7
23	I trust SSTs	1	2	3	4	5	6	7
24	Using SSTs makes me feel isolated	1	2	3	4	5	6	7
25	Using SSTs gives me a sense of independence	1	2	3	4	5	6	7
26	My personal information is treated confidentially in SSTs	1	2	3	4	5	6	7
27	Some SST related factors are beyond my control	1	2	3	4	5	6	7
28	I am afraid of carrying out SST transactions	1	2	3	4	5	6	7

		Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
29	I am confident in my abilities to work with SSTs	1	2	3	4	5	6	7
30	In my judgement, resources available for SST transactions are adequate	1	2	3	4	5	6	7
31	Could you please select 'strongly agree' for this statement	1	2	3	4	5	6	7
32	People who are important to me think that I should use SSTs	1	2	3	4	5	6	7
33	Customer service staff supports the use of SSTs	1	2	3	4	5	6	7
34	Using SSTs is socially acceptable	1	2	3	4	5	6	7
35	Crowding at physical interfaces influence me to use SSTs	1	2	3	4	5	6	7
36	If I am in a hurry, I usually use SSTs	1	2	3	4	5	6	7
37	I usually use SSTs when I am alone (not in a group)	1	2	3	4	5	6	7
38	I use SSTs, when the task is simple	1	2	3	4	5	6	7
39	I believe that SSTs are optional	1	2	3	4	5	6	7
40	Sometimes organizations have forced me to use SSTs	1	2	3	4	5	6	7
41	I intend to use SSTs in future	1	2	3	4	5	6	7
42	I predict I would use SSTs in future	1	2	3	4	5	6	7
43	I plan to continue my SST transactions in future	1	2	3	4	5	6	7

In answering the rest of the questionaire, please respond with respect to the most frequently used SSTs that you have identified in the <u>Section A</u>.

1. How can you rate your level of experience with SSTs?

Mostly inexperienced	Inexperienced	Somewhat inexperienced	Neutral	Somewhat experienced	Experienced	Mostly experienced

2. Please evaluate the following characteristics of information/instructions given by SSTs.

	Very poor	Poor	Somewhat poor	Neutral	Somewhat good	Good	Excellent
Relevance	1	2	3	4	5	6	7
Timeliness	1	2	3	4	5	6	7
Accuracy	1	2	3	4	5	6	7
Clarity	1	2	3	4	5	6	7
Consistency	1	2	3	4	5	6	7
Sufficiency	1	2	3	4	5	6	7
Simplicity	1	2	3	4	5	6	7

SECTION - C

This section consists of statements on your understanding of what you typically do in SST context. Please read each statement carefully and circle the response, which best expresses your level of

		Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
01	I am capable in gathering required information for my SST transactions	1	2	3	4	5	6	7
02	I share my information/experiences about SSTs, so that others can follow them for better decisions	1	2	3	4	5	6	7
03	I am good at following instructions given by SSTs	1	2	3	4	5	6	7
04	I am good at recalling frequently needed information for SST transactions such as passwords, pin numbers etc	1	2	3	4	5	6	7
05	I often provide feedback to the company, whenever I am asked to do so	1	2	3	4	5	6	7
06	I can perform my own SST transactions	1	2	3	4	5	6	7
07	I can personalize my service from the available options in SSTs	1	2	3	4	5	6	7
08	I can decide on the delivery options in some SST transactions based on my requirements	1	2	3	4	5	6	7
09	I can fulfil the basic requirements to perform SST transactions (eg: identity proofs, own emails, bank accounts, age)	1	2	3	4	5	6	7
10	I usually accept terms and conditions in SST transactions	1	2	3	4	5	6	7
11	I am willing to take the responsibility over my own SST transactions	1	2	3	4	5	6	7
12	I am willing to adapt myself to the developments/changes in SSTs	1	2	3	4	5	6	7
13	Could you please circle ‘strongly disagree’ for this statement	1	2	3	4	5	6	7
14	Although I deal with SSTs, I can still connect with employees of the organization when necessary	1	2	3	4	5	6	7
15	I can get the help of customer services staff, when I face with SST transaction difficulties	1	2	3	4	5	6	7
16	I am aware of the warning messages and respond to them in order to prevent errors in SST transactions	1	2	3	4	5	6	7
17	If something goes wrong with SST transactions, I can still correct it through different processes	1	2	3	4	5	6	7
18	I am not good at searching all relevant information on what I exactly want in SSTs	1	2	3	4	5	6	7
19	Normally I do not share information/experiences with others unless it badly hurts me	1	2	3	4	5	6	7
20	Some of the SST instructions made me confused	1	2	3	4	5	6	7

		Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
27	I usually forget frequently needed information such as passwords, pin numbers etc	1	2	3	4	5	6	7
28	I usually do not provide feedback	1	2	3	4	5	6	7
29	Sometimes I find difficulties in performing SST transactions	1	2	3	4	5	6	7
30	Delivery options given by some SSTs (eg: online transactions) are not helpful to me	1	2	3	4	5	6	7
31	I find it difficult to complete SST transactions due to not meeting basic requirements	1	2	3	4	5	6	7
32	Delivery options given by some SSTs (eg: online transactions) are not helpful to me	1	2	3	4	5	6	7
33	I find it difficult to complete SST transactions due to not meeting basic requirements	1	2	3	4	5	6	7
34	Could you please circle ‘strongly agree’ for this statement	1	2	3	4	5	6	7
35	I do not like to take the responsibility over the unseen SST transactions	1	2	3	4	5	6	7
36	While SSTs continually change, I am not keen to accept change	1	2	3	4	5	6	7
37	I can’t tolerate delays, failures or technological errors in SST transactions	1	2	3	4	5	6	7
38	SSTs limit our connection with the organization and other customers	1	2	3	4	5	6	7
39	Automated responses given by many SSTs irritate me, when I really need the human support	1	2	3	4	5	6	7
40	I have experienced many difficulties in connecting with the supportive staff when needed	1	2	3	4	5	6	7
41	I usually experience problems as I often do not pay adequate attention to warning messages of SSTs	1	2	3	4	5	6	7
42	I have experienced difficulties in correcting errors in SST transactions	1	2	3	4	5	6	7

SECTION -D

This section consists of statements relevant to your experience in SSTs. Please read each statement carefully and circle the response which best expresses your level of agreement.

		Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
01	I just accomplish just what I wanted to do through SSTs	1	2	3	4	5	6	7
02	SSTs help me to save my time	1	2	3	4	5	6	7
03	SSTs is a good solution to my busy life	1	2	3	4	5	6	7
04	Working with SSTs is cost efficient	1	2	3	4	5	6	7
05	I enjoy SST transactions	1	2	3	4	5	6	7
06	I feel relaxed with SST transactions	1	2	3	4	5	6	7
07	SST transactions make me excited	1	2	3	4	5	6	7
08	I feel a sense of adventure when working with SSTs	1	2	3	4	5	6	7
09	SSTs are boring	1	2	3	4	5	6	7
10	Working with SSTs is stressful	1	2	3	4	5	6	7
11	Working with SSTs makes me feel lonely	1	2	3	4	5	6	7

These demographic details will only be used for the classification purposes. Please tick the appropriate box of your response.

Your Gender:	Male		Female	

Your Age	18-24 Yrs.		45-54 Yrs	
	25-34Yrs		55-64 Yrs	
	35-44 Yrs		65 or older	

Your Highest education level	GCSE level		Postgraduate Degree	
	GCE AL or equivalent		Other qualification	
	University Degree or equivalent			

Your Employment	Full time employed		Un employed	
	Part time employed		Retired	
	Self employed		Student	

Duration of staying in UK	Less than one year		More than 10 years	
	1-5 years		Since birth	
	6-10 years			

Thank you for your cooperation

Annexure vi: Missing value analysis

Missing value analysis							
				Missing		No. of Extremes	
	N	Mean	Std. Deviation	Count	Percent	Low	High
A1	491	2.43	1.168	2	.4	0	22
A2	492	2.28	1.091	1	.2	0	13
A3	490	2.66	.961	3	.6	0	18
A4	492	2.13	1.117	1	.2	0	20
A5	490	3.95	1.199	3	.6	34	0
A6	491	3.73	1.020	2	.4	21	0
A7	490	3.47	1.009	3	.6	20	0
A8	490	4.17	.933	3	.6	33	0
A9	490	3.44	1.434	3	.6	0	0
A10	490	1.99	1.148	3	.6	0	19
A11	491	4.37	.959	2	.4	30	0
A12	492	2.87	1.330	1	.2	0	0
A13	491	3.41	1.518	2	.4	0	0
A14	492	3.51	1.399	1	.2	0	0
A15	493	3.74	.962	0	.0	13	0
A16	493	3.08	1.051	0	.0	0	0
A17	493	1.87	1.038	0	.0	0	36
A18	491	2.46	1.148	2	.4	0	29
A19	493	2.23	1.042	0	.0	0	15
PERF1	490	5.90	.972	3	.6	13	0
PERF2	490	5.87	1.013	3	.6	10	0
PERF3	492	5.81	1.053	1	.2	15	0
PERF4	489	5.53	1.175	4	.8	33	0
PERF5	492	5.35	1.170	1	.2	29	0
PERF6	489	5.01	1.166	4	.8	12	0
PERF7	492	5.26	1.101	1	.2	38	0
PERF8	491	4.76	1.195	2	.4	26	0
PERF9	490	5.21	1.275	3	.6	23	0
CONV1	492	5.34	1.171	1	.2	17	0
CONV2	492	5.44	1.143	1	.2	39	0
CONV3	492	5.88	1.087	1	.2	19	0
CONV4	492	5.56	1.200	1	.2	35	0
CONV5	493	5.75	1.154	0	.0	23	0
TECK1	491	5.38	1.140	2	.4	37	0
TECK2	492	5.74	1.040	1	.2	29	0
TECK3	492	5.78	1.084	1	.2	27	0
EMOR1	492	4.76	1.363	1	.2	37	0
PERJ2	492	3.67	1.494	1	.2	0	11
PERJ6	492	5.16	1.129	1	.2	12	0
EMOR4	492	3.40	1.694	1	.2	0	50
EMOR2	492	4.55	1.317	1	.2	6	0
PERJ1	492	4.83	1.213	1	.2	18	0
EMOR5	492	3.52	1.672	1	.2	0	51

PERJ3	493	5.12	1.277	0	.0	17	0
PERJ4	493	4.98	1.239	0	.0	20	0
PERJ5	493	4.99	1.370	0	.0	36	0
EMOR3	493	3.60	1.712	0	.0	0	0
PERJ7	493	5.35	1.116	0	.0	41	0
PERJ8	493	5.56	1.061	0	.0	20	0
SOIN1	493	4.10	1.254	0	.0	16	5
SOIN2	493	4.14	1.265	0	.0	16	6
SOIN3	493	4.84	1.106	0	.0	16	0
SOIN4	493	5.64	1.120	0	.0	20	0
SIFA1	492	5.24	1.396	1	.2	23	0
SIFA2	490	5.44	1.310	3	.6	16	0
SIFA3	492	4.48	1.339	1	.2	8	0
SIFA4	491	5.33	1.408	2	.4	27	0
VOLU1	489	5.33	1.235	4	.8	19	0
VOLU2	492	3.90	1.774	1	.2	0	0
BEIN1	490	5.77	1.082	3	.6	19	0
BEIN2	491	5.80	1.157	2	.4	21	0
BEIN3	491	5.91	1.178	2	.4	21	0
Past Experience	491	5.32	1.052	2	.4	34	0
Relevance	490	5.61	.912	3	.6	12	0
Timeliness	493	5.59	1.014	0	.0	19	0
Accuracy	490	5.65	.988	3	.6	16	0
Clarity	492	5.37	1.031	1	.2	27	0
Consistency	491	5.52	1.031	2	.4	23	0
Sufficiency	493	5.36	1.003	0	.0	24	0
Simplicity	491	5.23	1.100	2	.4	37	0
COLE1	491	5.58	.977	2	.4	24	0
COLE2	491	4.26	1.525	2	.4	18	0
COLE3	492	5.66	1.041	1	.2	24	0
COLE4	492	5.65	1.209	1	.2	35	0
COLE5	492	3.50	1.572	1	.2	0	13
COPR1	492	5.70	.973	1	.2	22	0
COPR2	492	5.30	1.107	1	.2	33	0
COPR3	492	5.43	1.031	1	.2	23	0
COOP1	493	5.93	.934	0	.0	34	0
COOP2	493	5.74	1.047	0	.0	18	0
COOP3	493	5.60	1.024	0	.0	25	0
COOP4	493	5.66	1.247	0	.0	35	0
COOP5	493	3.62	1.617	0	.0	0	13
CONE1	493	5.38	1.067	0	.0	30	0
CONE2	493	5.36	1.085	0	.0	34	0
CORE1	493	5.44	1.016	0	.0	25	0
CORE2	493	4.99	1.090	0	.0	18	0
UNDE	493	5.31	1.055	0	.0	35	0
PROC	493	4.90	1.249	0	.0	25	0
ENGE	493	5.06	1.244	0	.0	29	0
RSCR	493	4.85	1.070	0	.0	14	20
RDIS	492	5.31	1.032	1	.2	22	0

RCLA	492	5.02	1.091	1	.2	17	0
REXP	493	4.63	1.229	0	.0	20	0
RDEV	492	5.13	1.375	1	.2	18	0
RPER	493	5.49	1.047	0	.0	27	0
CD_LE1	493	3.59	1.476	0	.0	0	13
CD_LE2	492	4.28	1.518	1	.2	7	0
CD_LE3	493	4.81	1.263	0	.0	35	0
CD_LE4	493	3.14	1.691	0	.0	0	17
CD_LE5	493	4.84	1.543	0	.0	13	0
CD_PR1	493	4.50	1.471	0	.0	14	0
CD_PR2	493	4.02	1.434	0	.0	16	12
CD_PR3	493	3.37	1.354	0	.0	0	10
CD_CO1	493	2.92	1.430	0	.0	0	25
CD_CO2	493	3.55	1.547	0	.0	0	16
CD_CO3	493	3.81	1.539	0	.0	0	26
CD_CO4	489	2.87	1.651	4	.8	0	8
CD_CO5	492	4.72	1.540	1	.2	10	0
CD_CN1	493	4.95	1.575	0	.0	14	0
CD_CN2	493	5.39	1.550	0	.0	36	0
CD_CN3	492	4.66	1.395	1	.2	7	0
CD_CR1	491	4.12	1.505	2	.4	19	0
CD_CR2	493	4.51	1.421	0	.0	9	0
FUNE1	493	5.44	.983	0	.0	22	0
FUNE2	493	5.90	.998	0	.0	13	0
FUNE3	493	5.80	1.135	0	.0	20	0
FUNE4	493	5.58	1.141	0	.0	22	0
EMEX1	493	4.90	1.351	0	.0	30	0
EMEX2	493	5.07	1.332	0	.0	26	0
EMEX3	493	4.08	1.418	0	.0	25	21
EMEX4	493	4.42	1.609	0	.0	28	0
EMEX5	493	3.59	1.382	0	.0	0	9
EMEX6	492	3.67	1.387	1	.2	0	5
EMEX7	493	3.51	1.539	0	.0	0	15
Gender	493	1.46	.499	0	.0	0	0
Age	493	3.04	1.340	0	.0	0	13
Education	493	3.27	1.149	0	.0	0	0
Employment	492	1.91	1.230	1	.2	0	12
a. Number of cases outside the range (Mean - 2*SD, Mean + 2*SD).							
b. Little's MCAR test: Chi- square= 9125.277, DF=9201, Sig.=0710							

Chi-Square (χ^2)	DF	Sig
9244.025	9328	.730

Annexure vii: Recognition of Multivariate outliers (Mahalanobis Distance)

Observation number	Mahalanobis d-squared	p1	p2
54	198.010	.000	.000
134	165.044	.000	.000
304	164.021	.000	.000
59	162.822	.000	.000
202	147.079	.000	.000
204	145.446	.000	.000
135	143.320	.000	.000
382	138.664	.000	.000
13	134.471	.000	.000
46	133.310	.000	.000
263	132.765	.000	.000
367	130.687	.000	.000
141	130.261	.000	.000
88	124.595	.000	.000
71	123.931	.000	.000
86	123.304	.000	.000
439	122.606	.000	.000
486	122.368	.000	.000
117	119.802	.000	.000
449	118.590	.000	.000
61	117.268	.000	.000
440	115.988	.000	.000
76	114.282	.000	.000
248	113.956	.000	.000
124	112.258	.000	.000
288	109.210	.000	.000
2	107.814	.000	.000
101	106.052	.000	.000
11	106.013	.000	.000
166	105.841	.000	.000
453	105.613	.000	.000
19	105.133	.000	.000
153	101.569	.000	.000
206	101.322	.000	.000
83	99.857	.000	.000
10	99.475	.000	.000
354	99.234	.000	.000
316	99.026	.000	.000
447	98.165	.000	.000
34	96.381	.000	.000
30	95.858	.000	.000

Observation number	Mahalanobis d-squared	p1	p2
282	94.715	.000	.000
66	94.354	.000	.000
133	93.886	.000	.000
475	92.675	.000	.000
40	91.449	.000	.000
38	91.372	.000	.000
446	89.931	.001	.000
424	89.835	.001	.000
188	88.818	.001	.000
445	87.933	.001	.000
444	87.220	.001	.000
438	86.717	.001	.000
311	86.054	.002	.000
451	85.885	.002	.000
98	84.658	.002	.000
42	84.445	.002	.000
456	84.108	.002	.000
78	83.991	.002	.000
442	83.145	.003	.000
369	82.867	.003	.000
103	82.793	.003	.000
380	82.206	.004	.000
337	82.178	.004	.000
205	81.999	.004	.000
470	81.312	.004	.000
211	81.222	.005	.000
113	81.110	.005	.000
290	81.043	.005	.000
18	80.503	.005	.000
48	80.168	.006	.000
165	79.338	.007	.000
425	78.701	.008	.000
326	78.335	.008	.000
109	78.079	.009	.000
171	77.693	.009	.000
465	77.659	.009	.000
170	76.952	.011	.000
296	76.813	.011	.000
454	76.664	.012	.000
468	76.648	.012	.000

Annexure viii: Univariate Normality

Descriptive Statistics

	N	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
INTE	411	5.7970	.04137	.83867	-1.237	.120	2.321	.240
NEMO	411	1.8995	.04292	.87004	.143	.120	-.249	.240
PEMO	411	4.8162	.05013	1.01629	-.844	.120	.661	.240
FUNC	411	5.7213	.03781	.76654	-.963	.120	1.312	.240
CODE	411	3.3860	.04433	.89871	-.532	.120	-.458	.240
COCR	411	4.9785	.02973	.60275	-1.283	.120	2.486	.240
INFO	411	5.6591	.03542	.71813	-.580	.120	-.002	.240
SITU	411	5.9882	.04636	.93984	-.697	.120	.009	.240
COVI	411	6.3694	.03910	.79266	-.716	.120	-.043	.240
SOCI	411	3.9488	.04486	.90950	-.496	.120	.585	.240
KNOW	411	5.1397	.03885	.78754	-1.233	.120	2.704	.240
PEFF	411	6.1450	.03902	.79108	-.487	.120	-.431	.240
Valid N (list-wise)	411							

Annexure ix: Multivariate normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
FUNE1	1.000	7.000	-1.277	-10.567	2.868	11.869
EMEX5	1.000	7.000	.191	1.577	-.454	-1.877
EMEX6	1.000	7.000	.116	.963	-.646	-2.673
EMEX7	1.000	7.000	.399	3.300	-.554	-2.292
TECK3	2.000	7.000	-1.243	-10.284	2.391	9.893
Sufficiency	2.000	7.000	-.831	-6.882	.704	2.913
CONV2	2.000	7.000	-1.001	-8.284	1.250	5.172
BEIN1	2.000	7.000	-.894	-7.397	1.355	5.607
BEIN2	1.000	7.000	-1.353	-11.196	2.766	11.445
BEIN3	2.000	7.000	-1.244	-10.295	2.174	8.998
Clarity	3.000	7.000	-.683	-5.652	.414	1.713
EMEX3	1.000	7.000	-.095	-.784	-.026	-.108
EMEX2	1.000	7.000	-.851	-7.042	.588	2.435
EMEX1	1.000	7.000	-.549	-4.546	-.096	-.396
FUNE4	1.000	7.000	-.999	-8.270	1.187	4.913
FUNE3	1.000	7.000	-1.233	-10.203	2.571	10.641
FUNE2	1.000	7.000	-1.124	-9.304	2.499	10.343
CD_LE3	1.000	7.000	-.787	-6.517	.386	1.599
CD_PR2	1.000	7.000	-.136	-1.130	-.813	-3.365
CD_PR1	1.000	7.000	-.638	-5.280	-.605	-2.504
CD_CN2	1.000	7.000	-1.006	-8.328	.396	1.638
CD_CR1	1.000	7.000	-.413	-3.418	-.849	-3.513

Variable	min	max	skew	c.r.	kurtosis	c.r.
CD_CR2	1.000	7.000	-.635	-5.253	-.363	-1.502
COOP4	1.000	7.000	-1.250	-10.343	1.791	7.411
COOP3	2.000	7.000	-1.268	-10.491	2.214	9.163
COOP2	2.000	7.000	-1.156	-9.564	2.261	9.356
COOP1	2.000	7.000	-1.131	-9.363	2.497	10.332
COPR3	1.000	7.000	-.956	-7.912	1.666	6.896
COPR2	1.000	7.000	-1.030	-8.529	1.562	6.464
COPR1	2.000	7.000	-1.336	-11.058	3.198	13.233
COLE3	1.000	7.000	-1.217	-10.077	3.241	13.411
COLE1	1.000	7.000	-1.474	-12.198	4.300	17.792
Relevance	3.000	7.000	-.581	-4.811	.349	1.446
Timeliness	3.000	7.000	-.639	-5.288	.392	1.624
Accuracy	3.000	7.000	-.659	-5.452	.455	1.885
SIFA1	1.000	7.000	-.651	-5.385	-.059	-.246
SIFA2	2.000	7.000	-.868	-7.186	.418	1.730
CONV3	3.000	7.000	-.784	-6.491	.102	.423
CONV4	2.000	7.000	-.749	-6.197	.380	1.574
CONV5	3.000	7.000	-.891	-7.376	.354	1.466
SOIN1	1.000	7.000	-.337	-2.789	.313	1.294
SOIN2	1.000	7.000	-.444	-3.677	.458	1.896
SOIN3	1.000	7.000	-.443	-3.668	-.316	-1.307
TECK1	2.000	7.000	-.827	-6.842	1.104	4.569
TECK2	1.000	7.000	-1.424	-11.783	3.448	14.268
PERJ7	2.000	7.000	-1.221	-10.105	2.004	8.291
CONV1	2.000	7.000	-.806	-6.671	1.116	4.618
PERF1	3.000	7.000	-.704	-5.827	.528	2.186
PERF2	4.000	7.000	-.531	-4.396	-.538	-2.226
PERF3	3.000	7.000	-.627	-5.190	-.093	-.387
PERF4	2.000	7.000	-.646	-5.351	.050	.205
Multivariate					535.823	73.871

Annexure x: Multicollinearity

Coefficients							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	117.752	70.681		1.666	.097		
Performance	20.311	11.741	.117	1.730	.084	.420	2.381
Knowledge	-49.862	12.678	-.299	-3.933	.000	.334	2.997
Social Influence	13.983	7.310	.093	1.913	.056	.825	1.212
Convenience	13.080	11.296	.079	1.158	.248	.414	2.415
Situational Factors	4.429	7.730	.035	.573	.567	.507	1.972
Information richness	10.396	11.531	.054	.902	.368	.547	1.827
Co creation	-3.519	13.963	-.018	-.252	.801	.372	2.687
Co destruction	17.697	6.707	.139	2.639	.009	.698	1.433
Functional experience	30.747	11.288	.198	2.724	.007	.366	2.730
Emotional experience	1.123	7.027	.009	.160	.873	.604	1.656
Co-creation Intention	-30.004	10.401	-.197	-2.885	.004	.413	2.423
a. Dependent Variable: ID							

Annexure xi: Factor correlation matrix

Factor	1	2	3	4	5	6	8	9
1	1							
2	.351**	1						
3	.270**	.243**	1					
4	.516**	.404**	.229**	1				
5	.393**	.771**	.163**	.423**	1			
6	.575**	.377**	.272**	.411**	.375**	1		
7	.664**	.490**	.243**	.470**	.492**	.557**	1	
8	.637**	.417**	.280**	.525**	.457**	.468**	.513**	1	.583**
9	.509**	.557**	.366**	.458**	.578**	.447**	.490**	.583**	1

Annexure xii: Reliability (Cronbach alpha) and Item to total correlations

Factor One

Reliability Statistics

Cronbach's Alpha	N of Items
.898	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PERF1	17.71	6.556	.738	.882
PERF2	17.73	5.902	.863	.837
PERF3	17.78	5.921	.798	.859
PERF4	18.04	5.684	.720	.895

Factor two

Reliability Statistics

Cronbach's Alpha	N of Items
.908	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TECK1	17.16	6.572	.787	.884
TECK2	16.82	6.667	.869	.855
TECK3	16.74	6.821	.846	.863
PERJ7	17.13	7.230	.681	.920

Factor three

Reliability Statistics

Cronbach's alpha	N of Items
.761	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SOIN1	9.03	3.587	.671	.587
SOIN2	8.88	3.474	.728	.516
SOIN3	8.46	4.766	.406	.870

Factor four

Reliability Statistics

Cronbach's Alpha	N of Items
.907	6

item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Relevance	27.93	13.593	.707	.896
Timeliness	27.94	13.013	.753	.889
Accuracy	27.88	12.969	.796	.883
Clarity	28.15	13.130	.753	.889
Sufficiency	28.17	12.904	.773	.887
Simplicity	28.29	13.060	.685	.900

Factor five

Reliability Statistics

Cronbach's Alpha	N of Items
.885	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation
TECK4	5.59	0.925	.794
TECK5	5.47	1.020	.794

Factor Six

Reliability Statistics

Cronbach's Alpha	N of Items
.792	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SIFA1	11.06	4.223	.587	.491
SIFA2	10.83	4.464	.621	.463
SIFA4	11.04	4.944	.343	.812

Factor seven

Reliability Statistics

Cronbach's Alpha	N of Items
.860	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CONV3	11.70	3.190	.740	.802
CONV4	11.99	3.039	.708	.829
CONV5	11.82	2.868	.761	.779

Annexure xiii: Exploratory factor analysis findings – Customer value co-creation intention in SSTs

Item	Factors									Communalities
	1	2	3	4	5	6	7	8	9	
PERF1	.641									.730
PERF2	.740									.852
PERF3	.604									.693
PERF4	.450									.667
TECH1		-.653								.714
TECH2		-.923								.904
TECH3		-.857								.841
PERJ 7		-419								.510
SOIN1			.926							.818
SOIN2			.842							.740
SOIN3			.542							.528
Relevance				.608						.699
Timeliness				.710						.734
Accuracy				.835						.762
Clarity				.812						.694
Sufficienc				.807						.693
Simplicity				.755						.616
TECH4					.608					.820
TECH5					.515					.754
SIFA 1						.575				.531
SIFA2						.794				.750
SIFA4						.407				.273
CONV3							.674			.731
CONV4							.720			.612
CONV5							.596			.665
PERF7								.408		.509
PERJ1								.448		.598
PERJ4								.434		.476
PERF6									.439	.552
EMO1									.619	.697
EMO2									.615	.600
Eigen	15.72	3.20	2.27	1.92	1.46	1.29	1.26	1.85	1.03	
%Variance	34.95	7.12%	5.05	4.25%	3.25%	2.86%	2.80%	2.63	2.29	
Cronbach	.898	.908	.761	.907	.885	.792	.860	.766	.809	

Annexure xiv: Customer value co-creation intention- Maximum likelihood estimates (CFA)

Item		Construct	β p<.001	SE	CI (95%)	C.R.
PERF1	<---	Performance	.801	.021	.751-.836	22.362
PERF2	<---	Performance	.931	.011	.906-.950	-
PERF3	<---	Performance	.863	.021	.816-.898	26.241
PERF4	<---	Performance	.759	.026	.700-.808	20.219
TECH1	<---	Teck-know-how	.823	.024	.771-.867	-
TECH2	<---	Teck-know-how	.848	.023	.792-.885	22.515
TECH3	<---	Teck-know-how	.834	.025	.772-.874	19.565
PERJ7	<---	Teck-know-how	.767	.037	.670-.824	17.415
TECH4	<---	Teck-know-how	.814	.021	.759-.850	18.822
TECH5	<---	Teck-know-how	.792	.030	.722-.841	18.088
SOIN1	<---	Social influence	.814	.087	.612-.969	8.907
SOIN2	<---	Social influence	.946	.115	.768-.1.19	-
SOIN3	<---	Social influence	.537	.053	.482-.592	8.605
Relevance	<---	Information richness	.821	.023	.769-.863	21.351
Timeliness	<---	Information richness	.890	.018	.847-.923	-
Accuracy	<---	Information richness	.867	.018	.827-.899	23.350
Clarity	<---	Information richness	.652	.035	.573-.715	14.703
Sufficiency	<---	Information richness	.691	.030	.630-.743	16.214
SIFA1	<---	Situational Factors	.788	.034	.716-.852	15.757
SIFA2	<---	Situational Factors	.871	.030	.812-.923	-
CONV3	<---	Convenience	.854	.023	.806-.895	20.496
CONV4	<---	Convenience	.749	.033	.678-.812	17.139
CONV5	<---	Convenience	.852	.021	.806-.899	-
PERJ1	<---	Emotional reactions	.666	.038	.579-.731	13.237
PERF6	<---	Emotional reactions	.696	.037	.611-.761	13.865
EMOR1	<---	Emotional reactions	.782	.041	.681-.846	-
EMOR2	<---	Emotional reactions	.718	.041	.617-.786	14.330
BEIN1	<---	Co-creation intention	.822	.028	.747-.864	24.121
BEIN3	<---	Co-creation intention	.950	.055	.916-.976	-
BEIN2	<---	Co-creation intention	.853	.015	.717-.937	26.125

Annexure xv: Customer value co-creation practices EFA

Item	Factors		Communalities
	1	2	
COLE1	.636		.526
COLE3	.651		.731
COPR1	.719		.537
COPR2	.736		.591
COPR3	.765		.639
COOP1	.645		.537
COOP2	.529		.499
COOP3	.590		.490
COOP4	.605		.548
CONE1		-.672	.523
CONE2		-.924	.831
CORE1		-.545	.491
Eigen Values	6.950	1.579	
% variance	40.884	17.271	58.155
Cronbach Alpha	.908	.794	

Annexure xvi: KMO and Bartlett's test for customer value co-creation practices in SSTs

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.916
Bartlett's Test of Sphericity	Approx. Chi-Square	3813.684
	df	136
	Sig.	.000

Annexure xvii: Item to total correlations in customer value co-creation practice

Item to total correlations in customer value co-creation practices

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
COLE1	66.47	82.485	.637	.909
COLE3	66.38	80.036	.733	.905
COLE4	66.39	81.608	.536	.914
COPR1	66.34	82.087	.665	.908
COPR2	66.74	79.737	.699	.907
COPR3	66.61	80.518	.713	.906
COOP1	66.11	82.153	.694	.907
COOP2	66.30	81.480	.645	.909
COOP3	66.44	81.588	.655	.908
COOP4	66.38	77.602	.710	.906
CONE2	66.68	82.148	.582	.911
CORE1	66.60	82.220	.625	.910
CORE2	67.05	83.423	.510	.914

Annexure xviii: Customer value co-creation practices: Maximum likelihood estimates-CFA

Item		Construct	β P<.001	SE	CI (95%)	C.R
COOP4	<---	Co-creation	.713	.042	.615-.789	-
COOP3	<---	Co-creation	.674	.045	.562-.750	12.677
COOP2	<---	Co-creation	.643	.042	.553-.718	12.050
COOP1	<---	Co-creation	.703	.036	.627-.773	13.228
COPR3	<---	Co-creation	.755	.035	.688-.820	14.064
COPR2	<---	Co-creation	.733	.038	.650-.803	13.654
COPR1	<---	Co-creation	.741	.035	.672-.810	13.912
COLE3	<---	Co-creation	.721	.040	.637-.796	13.496
COLE1	<---	Co-creation	.666	.051	.557-.757	12.476

Annexure xix: Customer value co-destructions: EFA

Item	Factors		Communalities
	1	2	
CD_PR2	.705		
CD_PR1	.687		
CD_CR2	.643		
CD_CR1	.642		
CD_CO1	.596	.317	
CD_PR3	.585		
CD_LE3	.573		
CD_CO2	.526		
CD_CO4		.588	
CD_CN2		-.539	
Eigen Values	6.950	1.579	
% variance	40.884	17.271	58.155
Cronbach Alpha	.908	.794	
Extraction method: Maximum likelihood, Rotation Method: Oblimin with Kaiser Normalization. Two factors extracted, 4 iterations required.			

Annexure xx: KMO and Bartlett's Test: Customer value co-destructions

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.844
Bartlett's Test of Sphericity	Approx. Chi-Square	2620.036
	df	105
	Sig.	.000

Annexure xxi: Reliability statistics and item to total correlations: Customer value co-destructions

Reliability Statistics

Cronbach's alpha	N of Items
.845	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CD_LE3	22.53	32.973	.532	.836
CD_PR1	22.83	29.456	.668	.811
CD_PR2	23.31	30.249	.633	.818
CD_CN2	21.94	30.622	.541	.837
CD_CR1	23.22	29.047	.675	.809
CD_CR2	22.83	29.348	.710	.803

Annexure xxii: Customer value co-destructions: Maximum likelihood estimates- CFA

Item		Construct	β P<.001	SE	CI (95%)	C.R
CD_LE3	<---	Co-destruction	.558	.048	.461-.649	11.083
CD_CR1	<---	Co-destruction	.804	.034	.725-.862	-
CD_CR2	<---	Co-destruction	.854	.025	.798-.900	17.514
CD_PR1	<---	Co-destruction	.662	.039	.580-.740	13.405
CD_PR2	<---	Co-destruction	.670	.040	.590-.744	13.631
CD_CN2	<---	Co-destruction	.637	.039	.545-.706	12.913

Annexure xxiii: Customer value co-creation experience -EFA

Item	Factors			
	1	2	3	Communalities
FUNE1	.494			.415
FUNE2	.970			.851
FUNC3	.869			.805
FUNC4	.697			.606
EMEX1		.798		.779
EMEX2		.639		.733
EMEX3		.818		.582
EMEX4		.541		.537
EMEX5			.652	.511
EMEX6			.905	.775
EMEX7			.741	.585
Eigen values	4.992	1.823	1.315	
%Variance	44.748%	16.577%	11.954%	73.279%
Cronbach Al	.862	.908	.808	

Annexure xxiv: KMO and Bartlett's Test: Customer value co-creation experience

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.824
Bartlett's Test of Sphericity	Approx. Chi-Square	2649.644
	df	55
	Sig.	.000

Annexure xxv: Reliability statistics and item to total correlations: Customer value co-creation experience

Factor one

Reliability Statistics

Cronbach's Alpha	N of Items
.862	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
FUNE1	17.71	7.218	.539	.889
FUNE2	17.18	6.361	.824	.782
FUNE3	17.24	6.009	.794	.788
FUNE4	17.51	76.041	.706	.827

Factor two

Reliability Statistics

Cronbach's Alpha	N of Items
.908	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EMEX1	13.95	11.722	.738	.782
EMEX2	13.76	12.422	.697	.802
EMEX3	14.84	11.438	.716	.790
EMEX4	14.44	11.300	.605	.847

Factor three

Reliability Statistics

Cronbach's Alpha	N of Items
.808	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EMEX5	7.00	6.580	.618	.776
EMEX6	6.94	5.997	.725	.668
EMEX7	7.08	5.781	.635	.765

Annexure xxvi: Customer value co-creation experience: Maximum likelihood estimates-CFA

Item		Construct	β P<.001	SE	CI (95%)	C.R
FUNE4	<---	FUNC	.779	.030	.712-.833	20.464
FUNE3	<---	FUNC	.938	.018	.892-.967	-
FUNE2	<---	FUNC	.862	.020	.814-.897	24.371
EMEX3	<---	PEMO	.568	.044	.476-.646	11.785
EMEX2	<---	PEMO	.956	.030	.908-.100	-
EMEX1	<---	PEMO	.826	.034	.746-.883	18.123
EMEX7	<---	NEMO	.740	.039	.658-.811	14.019
EMEX6	<---	NEMO	.841	.033	.766-.898	-
EMEX5	<---	NEMO	.732	.039	.660-809	13.873