

The Impact of National Culture and Other Cognitive Factors on Servitization

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Abstract

The University of Manchester

Edward Crowley

Doctorate of Business Administration (DBA)

The Impact of National Culture and Other Cognitive Factors on Servitization

Servitization research has provided rich insight into servitization at the organisational level and at a broad level across industries; however, understanding of servitization at the individual industry level has been limited. The research began as an exploration of the servitization of the office products (OP) industry. This thesis defined servitization as the shift from a product-centric business model and logic to a service-centric approach (Kowalkowski et al., 2017), which can be measured by comparing the proportion of the firm's (or business unit's) revenue from services to total revenue for that firm (or business unit). Quantitative grounded theory was used to analyse longitudinal data from interviews with 5,913 corporate decision makers responsible for service contract decisions between 2008 and 2012. Consistent with the grounded theory method, data guided the analysis and indicated that industry level servitization shows similar characteristics to servitization at the firm level in terms of the evolution of service offerings and the customer outcomes achieved from these offerings. The analysis also indicated that within the OP industry firms were not achieving a consistent level of servitization (as measured by service revenues), despite their similar service offerings and results.

To understand this phenomenon, a second phase of research was undertaken using in-depth personal interviews with industry executives to understand why some firms were not achieving the same level of servitization despite their desire to achieve a higher level of servitization. This desire for a higher level of servitization is identified as *servitization intent*. The second phase of research identified a set of cognitive factors, including *what is valued*, *tradition*, *belief in services*, *risk tolerance*, *intentionality*, *perspective to service*, *desire*, *change tolerance* and *trust*, that appear to represent challenges in the servitization process for some firms. These appear to be limiting factors to achieving servitization intent for firms headquartered in Japan but not for firms headquartered in the United States (US). The servitization process thus appears to be influenced by the national culture of the firm. This is the first contribution of this research.

Based upon this doctoral research, a three-layered model of servitization factors was developed, which includes cognitive factors at the micro-meso level, organizational factors at the meso level and industry level factors at the macro level. National culture appears to

influence both the cognitive and organizational factors, but it does not appear to be a factor at the industry level. This model represents the second contribution of this research.

The third contribution of this research is demonstrating the use of a mixed-methods research design guided by the grounded theory method to provide a dual lens approach for understanding servitization at both the industry level and the organizational / cognitive level. This dual lens approach was critical in identifying that at an industry level there were differences between servitization levels achieved by Japanese and US firms, while also enabling examination of individuals to identify the cognitive and organizational factors and how they differed between Japanese and US firms. Furthermore, the iterative abductive nature of the grounded theory method was well suited for understanding the complex set of dynamics associated with servitization at industry and organizational levels.

Declaration

I, Edward Crowley, declare that no portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Acknowledgement

I would like to thank my research supervisors, Professors Jamie Burton and Judy Zolkiewski, who dedicated countless hours to guiding me, providing feedback and generally supervising my doctorate efforts. While their wisdom during this process was invaluable, their support, encouragement and constant belief in me was even more important during the challenging task of publishing my research.

There is one individual without whom this process would not have been possible: my wife, Terri Crowley. Terri's support of my doctorate was beyond measure and unwavering, despite the financial sacrifices and the countless hours spent alone and caring for our children while I was studying, writing and attending sessions in Manchester. She did the heavy lifting for our family so I could pursue my dream of obtaining a doctorate. I am a blessed man to have such a special woman to share my journey with, and Terri is more than I could have ever asked for or expected.

My Research Journey and Perspective

During my 30-year career in the imaging industry, I had the opportunity to work both in major manufacturers and as a leading consultant to the industry. This experience provided me with a unique view of the industry and access to a unique cross-section of executives in the industry. I have seen major shifts in the industry, including the transition from analogue to digital products in the copier/MFP segment, movement from a cost-per-copy to a pay-for-use model and, most recently, the shift from selling products to providing services that included use of the products. Of these changes, the most significant for the industry has been the shift from selling products to providing services that include products. This shift began when I was responsible for products at a major manufacturer, and I began experiencing the shift from the perspective of a 'product-centric' participant who was somewhat antagonistic to the concept of offering services. Ultimately, as I founded my own successful global consulting firm, I assisted clients with this transition to a services-led model and became an advocate for services. At the same time that the industry underwent this transition, I began my personal academic journey with my studies at The University of Manchester. I found the difference between a practitioner focus and an academic focus to be dramatic.

Within the practitioner community, my success is defined by my ability to articulate a vision based upon a compelling set of data I had accumulated and to turn this vision into a 'tangible' plan with very specific actions, activities and objectives that demonstrated reasonable potential for success. I am measured on the successful execution of this plan. Ambiguity, theory and context are not only lacking but also not tolerated in the business context. Within the academic community, the approach was completely reversed. Rather than focusing on concrete actions and plans, academic study requires ingesting a broad spectrum of knowledge, constantly reviewing the latest additions to the field of knowledge relevant to a topic, and carefully analysing data and insights to develop or validate theoretical concepts and abstractions to expand the total field of knowledge. Ambiguity, theory and context are fundamental to the research process.

The differences were most visibly demonstrated in the writing process. When writing for the business world, it is critically important to have accurate facts, a compelling argument and convincing prose. With multiple awards for my business writing, I naively assumed academic writing would be easy and elected the alternate thesis format. Thankfully, I had very patient and persistent research supervisors who guided me through this process.

After multiple revisions in which reviewers provided fair but tough assessments of my (at the time) far from adequate writing, I learned that academic writing has a

fundamentally different philosophy than business writing. In business writing, the goal is to convince the reader that what you are writing is useful and relevant to them. In academic writing, the goal is to build upon and add to the existing base of knowledge. Understanding how your research fits within existing research and how it will expand this base of research is paramount. It is not enough to make statements that are compelling. Everything must be based upon prior research and data. Conceptual development is important, but it cannot be developed in isolation. The gruelling process of academic review is essential to ensuring not only the validity of the research but also that the research fits within this context of existing knowledge while providing some unique, additional insight.

A specific example of this is in the second paper in my thesis, ‘Servitization Intent as a Factor in the Servitization Process’. This paper began as a conference paper that won an award at the 2015 Spring Servitization Conference, which at the time was titled, *The Dilemma of Reversed Servitization in a Highly Servitized Industry: A Case Study of Failed Servitization and the Implications for Practitioners*. Through the review process, the reviewers challenged my initial proposition leading to the development of the concept of servitization intent, which represented a more compelling and impactful contribution than the original focus of the article on business model transformation. While the critical assessment of the article and subsequent revisions did not change the data, it forced me to re-examine the data and my analysis, which resulted in something new and compelling.

For me, this is perhaps the most advantageous result of pursuing a doctorate. It has forced me, on many levels, not only to examine how I interpret the information I receive but also to think about this information in a broader context in relation to the work others are doing and the work that has been done by those before me. As a result, I am able to make contributions both as a practitioner and an academic, based upon a much broader context than I had before. Furthermore, by bridging the practitioner and academic worlds, my goal is to act as a catalyst to bring these two different perspectives together and develop new insights benefiting both communities. This has been an incredibly challenging and rewarding journey for me.

Copyright Statement

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Dedication

This thesis is dedicated to my great-grandfather, John Crowley, an illiterate timberman who lived in the Irish Wilderness in south-eastern Missouri. While John could neither read nor write, he could accurately predict how much timber could be hewn from a tree by looking at it. A tall, thin, red haired great-grandson of an Irish immigrant with a large handlebar moustache, John was very much a product of his environment. He instilled in his children a sense of pride, hard work and perseverance that I am blessed to have inherited. He was a man who did very well by his family and his community despite a lack of formal education. I believe he would have been extremely proud to see the first one of his descendants obtain a doctorate, and my greatest hope is that I can be as strong of an example to my descendants as he was to me.

Candidate's Background

Edward Crowley obtained his Bachelor of Science degree from the University of Missouri in agricultural economics with an emphasis on computer science. Subsequently he earned a Masters of Business Administration from the University of Mary Hardin-Baylor. Mr. Crowley has 30 years of experience in the technology industry, holding executive and management positions with firms including QMS, Texas Instruments, IntelliQuest and Lexmark International. He founded the firm Photizo Group Inc. (a leading consulting and research firm for the imaging industry) and subsequently founded Virtulytix Inc. (www.virtulytix.com), an advanced analytics firm specializing in developing software as a service predictive analytics solutions for Internet of Things-enabled fleets.

Doctor of Business Administration Timeline

My Doctor of Business Administration (DBA) progressed in three major phases: course work, research (including presenting at academic conferences) and thesis development (including publishing). While the phases did not have defined boundaries, at the end of each phase there was a clear shift in focus into the next aspect of the doctorate programme. For example, in addition to the completion of coursework, there was a significant shift into the research phase as soon as my research proposal was accepted. Likewise, while the research and analysis continued through the publishing phase, upon the completion of my last conference in February 2016, there was a clear shift to publishing my work in the alternative thesis approach.

While there was significant and unique learning during each phase of my doctorate, three particular aspects were significant to me. During the coursework phase, in the review of my pilot project, the independent examiner challenged my methodology and whether it was data mining or grounded theory. This was my first introduction to the academic process of using critical discourse in challenging ideas and research, and it resulted in significant improvement in the defence and articulation of my research method. It also forced me to perform a deep dive into the specific methodology and significantly expand the scope of my understanding related to this methodology to be able to defend it in the future. This is when I began to value the academic approach of discursive challenges in improving my critical thinking (and as being key to the critical thinking process).

The next major learning was participating in conferences. Again, the interactive nature and critically challenging aspect of conferences and conference feedback resulted in a significant reshaping and enhancement of my research approach and analysis of the research. In this phase, in addition to reinforcing the value of critical discourse, I learned how presenting one's analysis and conclusions to a group of objective academics can result in a significant improvement.

The final and most challenging aspect of my DBA experience was the discursive process associated with publishing in academic journals. Academic writing requires taking a very different approach relative to business writing, not only in how one writes but also in how one frames arguments and builds a structure around the original research while also weaving in the existing body of knowledge to identify an original contribution and how it fits. While I found this to be the most difficult and challenging aspect of my academic work, it was also the most rewarding and impactful in shaping my research. Table 1 provides a timeline for the progression of my doctorate programme.

Table 1 – Doctorate Timeline

ACTIVITY	COMPLETION DATE
COURSEWORK PHASE	
• Entered Programme and Began Coursework	November 2012
• Cursory Literature Review (in line with Glaser re: Grounded Theory)	September 2013
• DBA Pilot Project	March 2014
• DBA Research Proposal Acceptance	July 2014
• Coursework Completed	October 2014
RESEARCH PHASE	
• Quantitative Grounded Theory Analysis	March 2014
Conference Presentation – IMP France – <i>Using Grounded Theory in Researching the Office Products Industry</i>	September 2014
Conference Presentation – IMP Asia (Bali) – <i>Are Japanese Firms at a Disadvantage</i>	December 2014
Conference Presentation – Aston Spring Servitization Conference – <i>Redesigning the Manufacturing Business Model for Services</i>	June 2015
• Elite Interviews	December 2015
Conference Presentation – IMP Asia (South Africa) – <i>Hidden Barriers to Servitization</i>	February 2016
THESIS DEVELOPMENT	
Abstract	October 2017
Chapter 1: Introduction	August 2019
Chapter 2: IMP Paper: ‘Using Grounded Theory in Researching the Office Products Industry’	September 2014
Chapter 3: JBIM Article: ‘Servitization Intent as a Factor in the Servitization Process’	Accepted July 2018
Notice of Submission	1 July 2018
Chapter 4: Article Pending Submission: ‘National Culture as a Barrier to Servitization’	Submitted August 2018
Chapter 5: Discussion	August 2018
SUBMISSION	September 2018
DEFENCE	November 2018

1.0 INTRODUCTION

1.1 Defining the Context: Servitization Research Background

By adding services to their offerings manufacturers seek to increase the value of their offerings through the process of servitization (Vandermerwe and Rada, 1988). Within this Thesis, servitization is defined as "The transformation processes whereby a company shifts from a product-centric to a service-centric business model and logic." (Kowalkowski et al., 2017, p. 7). The level of a firm's servitization can be measured by dividing the service revenue by the company (or divisions) total level of revenue (Fang, Palmatier, and Steenkamp, 2008). My research further refines the definition of servitization by positing that servitization encompasses a cognitive desire by actors within the organization to reach a different end-state for the organization which includes some level of servitization. This end-state is not the same for every organization; but rather, there are many different levels of servitization with a unique level of servitization being specific to each individual organization (Kowalkowski, Gebauer and Oliva, 2017; Salonen, Saglam and Hacklin, 2017a). However, in every case servitization requires some level of organizational transformation for the firm to reach the desired end state (Bigdeli *et al.*, 2017; Eskelinen, 2017).

Firms seek to improve their competitive position via servitization (Bustinza *et al.*, 2015), as well as to improve profits (Roser, DeFillippi and Samson, 2013; Mazzocato *et al.*, 2014; Worm *et al.*, 2017), improve customer retention (Penttinen and Palmer, 2007), and bring more value to their offerings (Ahamed, Kamoshida and Inohara, 2013). While the results of servitization do not always lead to increased profitability (Eggert *et al.*, 2014; Lee, Yoo and Kim, 2016), and the success of services may require involvement of other network actors than the manufacturer (Raddats *et al.*, 2014), the trend towards servitization of manufacturing continues (Sorin, 2014). Servitization also has the potential to impact not only individual firms, but also entire industries (Nadkarni and Barr, 2008). Servitization has been identified as a potential source of survival for firms during industry transformation; "It is possible that the ability of certain product firms and not others to add services successfully to their portfolio may impact the shakeout phenomenon observed in many product industries." (Nadkarni and Barr, 2008, p. 570). Thus, servitization has implications not only at the firm level but also the industry level.

Servitization research is extensive with over 1,092 servitization articles published prior to February 2017 (Rabetino *et al.*, 2018). Despite this extensive research there are still gaps in servitization research due to paradigmatic assumptions regarding the process of

servitization and how to servitize a manufacturing firm (Baines *et al.*, 2017). Furthermore, understanding organizational dynamics associated with servitization and the inter and intra-organizational barriers and enablers to servitization continues to be a gap in extant servitization theory (Perona, Saccani and Bacchetti, 2017; Story *et al.*, 2017). By utilizing research representing manufacturers across an entire industry, (the Office Products (OP) industry), it is possible to reduce this gap by identifying factors impacting servitization at both the industry and the individual firm level. Within this research, the OP industry is defined as consisting of firms which manufacture products which print, copy, scan and fax documents and which provide services associated with these products. These firms offer service contracts called Managed Print Services (Gaiardelli *et al.*, 2014), which incorporate pay-for-use models, bundles of services and products, and in some cases, advanced services including business process consulting.

The research utilized a mixed-method, grounded theory approach which evolved during the two major phases of research. The initial phase of research utilized Quantitative Grounded Theory (QGT) (Glaser, 2008) applied to secondary data based upon a survey of 5,913 corporate decision makers who were responsible for managed print service contracts. This survey was conducted yearly between 2008 and 2012 with respondents from Europe, North America, and Asia (Photizo Group, 2012) resulting in a longitudinal, global view of servitization within the OP industry based upon a customer perspective. The QGT method used in the first phase of the research is described in the first paper included in this thesis: “*Using Grounded Theory in Researching the Office Products Industry*”. Analysis of this data identified differences in servitization rates between firms providing similar service offerings to the same customers while competing in the same global market. However, it could not identify why there was a difference, leading to a second phase of research using purposeful sampling (Poulis, Poulis and Plakoyiannaki, 2013) of executives within the industry (elite interviews). Elite interviews were selected for their ability to explore complex phenomena (Jones and Alony, 2011) - a feature of servitization.

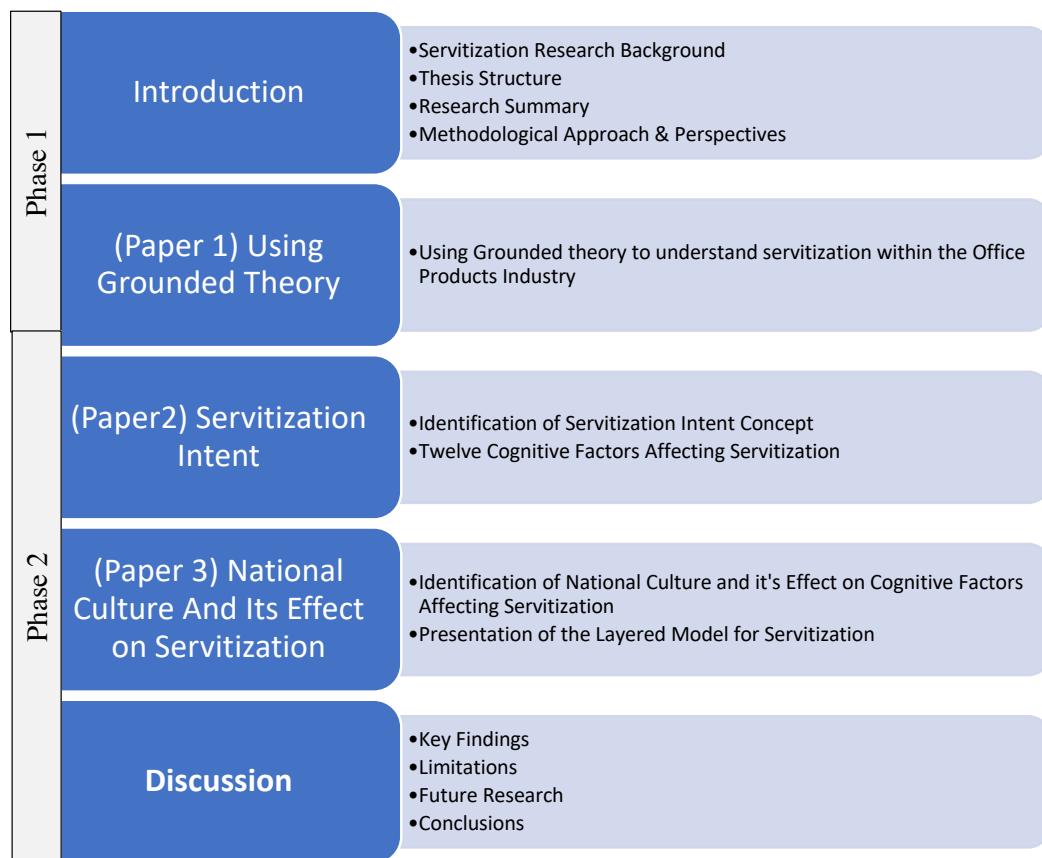
The second phase of the research uncovered the cognitive aspect of servitization, which is defined in this research as servitization intent, and a dissonance of this servitization intent within some organizations. Servitization intent and dissonance in this intent are presented in the second paper: “*Servitization Intent as a Factor in the Servitization Process*”. It also identified the impact of national culture on this cognition or servitization intent. A model consisting of four industry, nine organizational, and twelve cognitive factors which impact servitization was developed. The research found that one of the organizational factors

and nine of the cognitive factors are different between two groups of organizations; North America or Japan headquartered firms, indicating a linkage between the cognitive factors and the national culture of the organization's headquarters location. The third and final paper of this thesis presents this model and discusses the implications of these cognitive and organizational factors: *"Layered challenges to servitization: from cognitive to industry level"*.

1.2 Thesis Format and Structure

The thesis uses an alternative thesis format, in this case consisting of three papers, including one conference paper and two academic articles. The structure is illustrated in Figure 1.

Figure 1 - Thesis Structure



The first section of this Thesis includes this introduction to the research, the literature review, methodological and epistemological / ontological position, and the DBA timeline. This is followed by the conference paper (Crowley, Burton and Zolkiewskie, 2014b) which presents the quantitative grounded theory (QGT) approach utilized in the first phase of the

research. In this research, the QGT approach identified a difference between the level of servitization for two groups of firms in the industry, despite their offering similar services and achieving similar outcomes for customers. In order to fully understand the reason behind these differences, a second stage of research used elite interviews to explore the servitization dynamics within the industry further. The second paper included in this Thesis (Crowley, Burton and Zolkiewski, 2018b) is forthcoming in the Journal of Business and Industrial Marketing and addresses the results of the second stage of research. The paper identifies the concept of servitization intent and how dissonance within the organization of servitization intent may represent a barrier to servitization. The final paper presented in this thesis has been prepared for submission the International Journal of Operations and Production Management and leverages data from both the first and second stage of research to address the impact of national culture on cognitive factors in creating barriers and enablers to servitization. Following the papers, a review of the methodological choices is discussed including the choice of using a grounded theory framework throughout the research, utilizing Quantitative Grounded theory, and the selection of a mixed methods approach. Furthermore, the ontological and epistemological approach in regards to Grounded theory is addressed in order to provide a context for the grounded theory approach. The final section addresses the discussion, findings, limitations, recommendations for further research, and conclusions.

1.3 Literature Review

1.3.1 Defining Servitization

Servitization is "*The transformation processes whereby a company shifts from a product-centric to a service-centric business model and logic.*" (Kowalkowski *et al.*, 2017, p. 7). The level of a firm's servitization can be measured by dividing the service revenue by the company (or divisions) total level of revenue (Fang, Palmatier, and Steenkamp, 2008). Within the academic community there are three major schools of thought regarding servitization: Product Services Systems (PSS), Solutions Business, and Service Science (Rabetino *et al.*, 2018). The PSS approach focuses upon sustainability related concerns (Velu and Stiles, 2013) and the design of services as an integration with product systems using three disciplines: information systems, business management, and engineering and design (Boehm and Thomas, 2013). This is contrasted by the solutions business school of thought which relies upon a theoretical framework grounded in a resource-based view for servitization based upon the delivery of a complete solution integrating products and services (Storbacka *et al.*, 2013). Service Science is heavily focused upon a Service-

Dominant Logic (SDL) view (Vargo and Lusch, 2004) within the context of a multi-disciplinary approach including services sciences, management, and engineering (Abe, 2005; Chesbrough and Spohrer, 2006) to develop service centric business models (Maglio and Spohrer, 2013).

Traditionally servitization was identified as an end-point with the manufacturer achieving a shift to a predominantly service driven focus with manufacturing being secondary (Ahamed, Inohara and Kamoshida, 2013; Ulaga and Loveland, 2014). There is also an argument that servitization can be used to reinforce the existing manufacturing business (by selling more products and product-specific services), rather than being transformational in nature (Salonen, Saglam and Hacklin, 2017b). Increasingly the concept of servitization has shifted to a process with many potential end-points and paths (Kowalkowski *et al.*, 2015) ranging from service infusion with products remaining primary and services secondary, to a service led model with products being secondary (Kowalkowski *et al.*, 2017; Salonen, Saglam and Hacklin, 2017b). While less than 4% of capital goods firms always offer pay-for-use services (Adrodegari *et al.*, 2015) manufacturing firms are increasingly offering services with over half of manufacturing firms in the USA and Finland reporting some level of servitization (Neely, Benedetinni and Visnjic, 2011). An objective measurement of the level of servitization is provided by comparing the organizations service revenues to total revenues (Fang, Palmatier and Steenkamp, 2008). This is the measurement applied in this research to measure servitization at both an organization level and an industry level.

By definition, servitization involves some level of transformation (Adrodegari and Saccani, 2017; Bustinza, Vendrell-Herrero and Baines, 2017; Clegg *et al.*, 2017) for the organization's business model (Kastalli and Van Looy, 2013; Kowalkowski *et al.*, 2015; Visnjic, Wiengarten and Neely, 2016), capabilities (Parida *et al.*, 2015; Sousa and da Silveira, 2017), organization composition (Vendrell-Herrero *et al.*, 2014; Huikkola, Kohtamäki and Rabetino, 2016), and offerings (Matthyssens and Vandenbempt, 2008; Beltagui, 2018). This transformation may not follow a smooth linear transition from product focused manufacturing to customer centric services delivery (Kowalkowski *et al.*, 2017). Rather, the journey may encompass periods of progression towards servitization, and even periods of de-servitization where the organization shifts back towards the product centric business model or evolves into a hybrid model with some level of service focus but still predominantly focused on products (Ulaga and Reinartz, 2011; Ulaga and Loveland, 2014). Increasingly research recognizes there are many paths of servitization, not all of which end

up in a high level of servitization (Kowalkowski *et al.*, 2015). In some cases the firm may actually revert back to a product centric model in an intentional shift away from services, in a case of reverse-servitization (Finne, Brax and Holmström, 2013). Additionally, there is increasing recognition that servitization is not accomplished solely by the manufacturer alone, but rather, it involves greater complexity, involving both internal and external actors (Story *et al.*, 2017).

1.3.2 Key Servitization Research Themes

The impact of servitization across almost every aspect of the organization makes it a rich area of study involving many different business disciplines including business model theory (Barnett *et al.*, 2013), organizational change theory (Bigdeli *et al.*, 2017), marketing theory (Kamp and Parry, 2017; Lenka, Parida and Wincent, 2017), and business strategy theory (Rabetino, Kohtamäki and Gebauer, 2017). One measure of the complexity of servitization as a topic is evidenced by the 1,092 servitization articles published prior to February 2017 which touch upon servitization (Rabetino *et al.*, 2018). Several key themes have emerged from this research which include (but or not limited to): servitization as a process – not an end-point destination (Kowalkowski *et al.*, 2017), the paradox of firms investing to servitize but failing to realize the financial benefits of this servitization (servitization paradox) (Gebauer, Fleisch and Friedli, 2005; Visnjic and Van Looy, 2013), the emergence of multiple pathways to servitization (Raddats *et al.*, 2017; Salonen, Saglam and Hacklin, 2017b), the perceived risk associated with servitization (Nenonen, Ahvenniemi and Martinsuo, 2014; Ghotbabadi, Feiz and Baharun, 2016; Ziaee Bigdeli *et al.*, 2018), and the barriers to servitization (Hou and Neely, 2013; Confente, Buratti and Russo, 2015; Burton *et al.*, 2017). While a full review of each of these themes is beyond the scope of this thesis, this section briefly summarizes each of these themes.

A key theme of this servitization research is that servitization is a process, not an end point (Coreynen, Matthyssens and Van Bockhaven, 2015; Paslauskis *et al.*, 2016; Martinez *et al.*, 2017). The examples of firms that have successfully servitized range from firms that infused services to create greater value add through a combined product service system while retaining their manufacturing focus (Alter, 2012; Xing and Ness, 2016), such as PPG (Rothenberg, 2007), to manufacturing firms that have transformed from a product-centric business model to a services led model with products becoming secondary to services; such as the case of IBM (Ahamed, Inohara and Kamoshida, 2013).

Many firms fail to realize the promise of servitization (Fang, Palmatier and Steenkamp, 2008; Benedetinni and Neely, 2010; Finne, Brax and Holmström, 2013;

Valtakoski, 2017) resulting in a servitization paradox. The servitization paradox happens when firms make a large investment in servitizing their business, which leads to greater services offerings and increased costs to deliver these offerings, but which does not lead to a corresponding level of higher returns as a result of these service offerings (Gebauer, Fleisch and Friedli, 2005). This servitization paradox results in firms that attempt to servitize having a higher chance of failure than those that do not (Fang, Palmatier and Steenkamp, 2008).

While an argument can be made that one path of servitization is to reinforce the organization's existing product manufacturing business with additional supporting services versus shifting to a services led model (Salonen, Saglam and Hacklin, 2017b), any level of servitization requires significant change (Baines *et al.*, 2017). For a manufacturing company seeking to develop service offerings, five significant challenges arise during servitization. The first challenge is a strategic resistance, to servitization which is based upon the shift of business models from a product centric value generation model towards a service centric value generation model (Barnett *et al.*, 2013; Kastalli and Van Looy, 2013; Adrodegari and Saccani, 2017). A further challenge is the cultural challenge of balancing a product versus the service mindset. This involves a significant shift from an product-engineering focused culture to a customer-services focused culture (Gebauer and Kowalkowski, 2012). Closely aligned with this challenge is the potential gap in personnel capabilities required for new service development versus the existing capabilities based on product development present in most manufacturers (Burton *et al.*, 2017). The final challenge is the procedural challenge in developing the unique processes and structure required for services versus the existing manufacturing processes (Bustinza *et al.*, 2015; Buschmeyer, Schuh and Wentzel, 2016) including the new service development process (Burton *et al.*, 2017). A corollary challenge is that for firms lacking in-house technical knowledge, developing advanced services can be perceived as a high risk strategy (Ziaee Bigdeli *et al.*, 2018).

Despite the significant academic work identifying reasons for servitization failure, there is a continued call for further understanding of the reasons for servitization failure (Tukker, 2015). Research has identified multiple reasons for a lack of success in servitization including barriers to servitization at the organizational level (Benedetinni and Neely, 2010; Hou and Neely, 2013; Sandberg and Aarikka-Stenroos, 2014; Kowalkowski *et al.*, 2017; Valtakoski, 2017), dissonance between the product and service offerings (Jovanovic, Engwall and Jerbrant, 2016), and structural and process barriers (Ahamed *et al.*, 2013). These structural and process barriers include customer service and knowledge transfer

between functional areas in the organization (Paslauskis *et al.*, 2016), an inability to change behavioural processes (Gebauer, Friedli and Friedli, 2005), and organizational rigidities which inhibit the business model innovation associated with servitization (Sandberg and Aarikka-Stenroos, 2014). Further research is needed to understand the cost of reducing the risk association with servitization efforts (Bigdeli *et al.*, 2017) due to the financial risk associated with servitization efforts (Neely, 2009).

While the research into organizational factors inhibiting servitization is significant, research into understanding how individuals impact the organizational servitization process is limited. An exception is Lenka *et al.* (2018a) whom have built upon strategic research addressing how individual decisions result in organization level decisions and outcomes (Felin, Foss and Ployhart, 2015) to identify individual tactics for overcoming structural, strategic, cultural, and procedural resistance. Due to the focus on organizational factors, the individual factors, including cognitive factors, impacting servitization are minimized. However, the organization is made up of individuals and ultimately, individual actions and cognition impacts organizational outcomes (Zenger, 1992; Musriha, 2013).

1.3.3 The Missing Aspect of Servitization: New Cognitive Factors

Within business research, cognitive issues are seen as important in understanding many topics including: risk taking (Kahneman and Lovallo, 2007), the role of cognitive structures and processes in the field of strategy as practice (Einola, 2018), the impact of cognitive biases on strategic planning (Walker, 1984), the differences in cognitive processes between different nationalities of managers (Abramson, Keating and Lane, 1996), the ability of firms to adapt to radical change based on managerial cognition (Tripsas and Gavetti, 2000), and how executives cognitive processes play a role in decisions regarding business model transformation (Aspara *et al.*, 2013). Cognition is also recognized as an important element in servitization. Servitization research has identified cognitive factors which inhibit servitization including an overemphasis on tangible aspects of products in the business, a failure to recognize the potential of the service business, and a risk aversion of managers in manufacturing companies (Gebauer, Fleisch and Friedli, 2005). Limited research also recognizes the importance of cognition in the “*need for culture, management paradigms and skills realignment*” (Erasmus and Weeks, 2012, p. 3113) during the process of servitization. The cognitive aspects of resilience (Milanzi and Weeks, 2014) as well as the cognitive aspect of ambivalence have recently been explored in servitization research (Lenka *et al.*, 2018b). Lenka (2018b) has examined the role of ambivalence due to conflicting desires regarding products and services identifying ambivalence as an explanatory factor with both positive

(creative resource optimization, reconfiguration of accountability, and proactive decision making) and negative (resource inefficiency, dilution of accountability, and stalled decision making) implications. Work by Wilkens, Lienert, and Elfving (2016) indicates that managerial cognition does play a role in opportunity assessment and pursuit, and within integrated product service systems, this cognition may identify servitization not as an approach for pursuing new opportunities, but rather, a reaction to external competitive threats. Gebauer & Friedle (2005) propose that behavioural processes of both managers and employees are triggered by their cognitive frameworks.

This doctoral research project identifies two new servitization dynamics related to cognition. The first is the desire to servitize, or servitization intent. The second is the impact of national culture of the firm's headquarters location on the organizational culture. The process of servitization requires a change in the organizational culture (Dubruc, Peillon and Farah, 2014), and this research indicates that the national culture may impede a firm's ability to shift its organizational culture as part of the servitization process. Both of these topics will be discussed further in the following sections.

1.3.3.1 Servitization Intent: The Cognitive Desire to Servitize

The potential benefits to servitization include increasing competitiveness (Kindström, 2010; Gebauer, Gustafsson and Witell, 2011; Lerch *et al.*, 2014; Eloranta and Turunen, 2015), improving profitability (Lee, Yoo and Kim, 2016), and increasing customer satisfaction (Raja *et al.*, 2013). These benefits may engender intent by a manufacturer to pursue servitization of their business. I describe this desire to servitize as **servitization intent**. While intent is referred to in current servitization research, there is a gap in understanding the role that the cognitive intent to servitize a manufacturing business plays in the actual servitization process. Raja (2017) identifies the strategic intent of manufacturers to achieve recurring service revenue and market expansion as factors in servitization. While this refers to strategic intent as a driver, it does not identify servitization as the focal point of this intent, but rather, the outcome of a resilient revenue stream, as the focal point of the intent. Other research has explored the role of resilience in a firm's servitization effort and found that there are differences between manufacturing resilience and service resilience, and the true value of servitization is realized when the amalgamated resilience from manufacturing and service is delivered as part of a solution to a client (Milanzi and Weeks, 2014). This research treats reliance not as an individual or even group cognitive factor, but

rather as a result of processes within the organization which create certain characteristics (such as focus on the customer) in the organization (Milanzi and Weeks, 2014).

Intent is a complex cognitive concept which includes multiple components including desire, belief, choices, and action (Cohen and Levesque, 1990). Coshen and Levesque (1990) expand upon intent by arguing that commitment is an essential element of intention without which realization of the intent is not possible. In the case of servitization intent, there is a desire to achieve a different future state which includes some level of services. There is a belief that this level of services will bring some benefit to the organization. A myriad of choices is involved in servitization ranging from organizational changes and design (Ahamed *et al.*, 2013; Vendrell-Herrero *et al.*, 2014) to skills development (Azim, Subki and Yusof, 2018), and even what path to follow in servitizing (Kowalkowski *et al.*, 2017). Finally, the fulfilment of the intent may be realized by actions taken the firm to servitize, or in some cases, the intention may not be realized due to internal and/or external barriers that arise during the process of servitization (Hou and Neely, 2013). This research has found that servitization intent may not be consistent throughout the organization, and this dissonance in servitization intent may represent a barrier to servitization.

Managerial motivation (or intent), or lack-thereof, can impact a firm's willingness to invest resources in a services business (Gebauer and Fleisch, 2007). In turn, the firm's willingness to invest in resources for a services business impacts its ability to grow services from revenue (Gebauer, 2008). Therefore, I posit that servitization intent is a critical aspect of servitization. However, servitization intent may be moderated by the organization's culture, which in turn may be moderated by the national culture of the firm based upon its headquarters geographic location.

1.3.3.2 National Cultures Cognitive Impact on Servitization

Creating a service culture is identified as a critical aspect of servitization (Weeks, 2010; Dubruc, Peillon and Farah, 2014; Lienert, 2015) due to the fundamental difference between a transitionally focused manufacturing mindset and a relationship based service focus. Studies focused on national and business culture such as Hofstede's (1994) work have focused on values and attitudinal traits, not cognitive differences between national cultures. Hofstede's culture taxonomy defines six dimensions for culture including individualism versus collectivism, large versus small power distance, high versus low uncertainty avoidance, and masculinity versus femininity (Hofstede, 1994), long term versus short term orientation and indulgence versus restraint (Hofstede, 2011). However, differences beyond

values and attitudinal traits have been identified as important to business decision making (cognition). Specifically, differences have been found in how business people from different cultures (specifically the USA, Canada, and Japan) gather information and how they utilize cognitive decision making schema (Abramson, Keating and Lane, 1996). Additional support for the differences in cognition based on culture can be found in research identifying how for US, Swiss and Chinese managers different tactics were effective in terms of gaining approval for a proposed change; more direct approaches were effective for Western managers while Chinese managers gave higher value to indirect approaches through both personal and upward appeals (Yukl, Ping Fu and McDonald, 2003). Furthermore, a study of decision making by Japan versus North American managers indicated national culture impacts the individual manager's preferences in terms of profit centre controls (Chow, Kato and Merchant, 1996) and market entry decisions (Calantone, Di Benedetto and Song, 2010). The study identified that the Japanese firms use tight controls similar to North American firms, which was surprising given the Japanese firms are associated with collectivist culture versus the individualistic culture of North America. The consensus style decision making associated with this culture would seem to indicate greater participation in decision making, and hence a need for looser controls (Chow, Kato and Merchant, 1996). While this may seem to be contradictory, it may be explained by research which identifies that Japanese cultural decision making is becoming centralized among fewer senior managers (Karube *et al.*, 2009).

While demonstrating the importance of understanding cognition within the cultural context, this also indicates a need to understand the role that national culture plays upon the organizational culture, and hence, managerial cognition. The impact of national culture has been identified in differences between Japanese and North American firms in terms of the level of trust for in-group versus out-of-group trust and relative to collectivist Asian cultures versus Western individualist cultures. Collectivist cultures such as the Japanese culture are less likely to trust in those who are outside of the group relative to individualistic cultures (Huff and Kelley, 2003).

This research posits that national culture can act as a filter to the organizational culture and as such, impact the cognitive paradigms for manufacturing firms going through servitization. Research into servitization has provided focus on international differences in servitization, however, the focal point has primarily been upon demographic and market characteristics (Baines *et al.*, 2017) while neglecting national culture differences. This

research addresses calls for studies linking national culture to organizational culture (Bao and Toivonen, 2015).

1.4 Research Summary: Discovering New Cognitive Factors: Servitization Intent and National Culture

The genesis of this research began when, as a practitioner, my firm developed a global study called the Managed Print Services (MPS) Decision Maker Tracking Study (Photizo Group, 2012) to track how customers were adopting services provided by OP industry manufacturers between the years 2008 and 2013. This industry was one of the first to begin servitizing (Visintin, 2014) making it an interesting focal point to begin understanding servitization adoption and dynamics. Based upon the analysis of this data, during the first stage of my DBA research, it was determined that there were factors which were not being identified that were inhibiting servitization by a group of manufacturers within the industry. This led to a second stage of qualitative research using elite interviews with industry executives in order to fully understand these inhibitors and why there were differences between firms in the industry (despite offering similar service offerings, and producing similar outcomes, within the same market of global customers). This iterative research approach, with each succeeding round of research being guided by the data from the prior round of research, is consistent with the grounded theory method used throughout the study (Glaser and Strauss, 2008). Perhaps one of the most unique aspects of this mixed methods, grounded theory research approach is that it utilized both customer (MPS Decision Maker Tracking Study) and manufacturer (elite interviews) viewpoints to provide a holistic view of servitization within an industry. A second unique aspect of the work is the use of Quantitative Grounded Theory (QGT) to analyse industry level servitization data. While the QGT method has been well defined (Glaser, 2008), its use in business research remains rare.

1.4.1 Paper 1: Using Mixed Methods to Uncover New Cognitive Factors

This paper (Crowley, Burton and Zolkiewskie, 2014b) was presented at the IMP Conference in Bordeaux France in 2015 and describes the use of Quantitative Grounded Theory (QGT) to analyse the results of the MPS Decision Maker Tracking Study (Photizo Group, 2012). QGT was selected due to its ability to develop theory from quantitative data when using secondary data (Glaser, 2008). The focus of my paper (Crowley, Burton and Zolkiewskie, 2014b) was the use of method, although it does describe selected results in terms of indices analysis in order to describe the method and identify the need for further theoretical development and research in order to meet the requirement of producing theory in order to qualify as grounded theory (Glaser and Strauss, 2008).

The QGT study identified that servitization of the OP industry is increasing with time, and that as the level of servitization increases the service offerings are evolving from basic – product centric services to advanced outcome-based services. These findings were consistent with theories for servitization evolution with a fairly linear evolutionary pattern as described by early servitization theory (Jacob and Ulaga, 2008; Gebauer *et al.*, 2010; Kindström, 2010; Baines, Lightfoot and Smart, 2011). Both firms with headquarters in Japan, and headquarters in North America exhibited this same evolutionary pattern of offerings shifting from product centric services to outcome-based services. Given this similarity in service offering evolution one would expect both sets of firms to have similar growth in levels of servitization (as measured by service revenue versus total revenue (Fang, Palmatier and Steenkamp, 2008)). However, while the servitization levels for North American firms increased, the servitization levels for Japanese firms increased at a much lower rate. This indicates that some factor is hindering Japanese firm's ability to realize the financial benefits (in terms of service revenue) associated with their investments in servitization relative to competing North American firms. It is important to note that both Japanese and North American OP Industry manufacturers compete in the same global markets for the same customers, hence this appears to be a dynamic which is related to headquarter location.

This research, consistent with the grounded theory method, indicated a need to conduct further research in order to understand the difference between Japanese and North American firms. Specifically, to identify what factors were acting as a barrier to Japanese firms. Grounded theory is predicated upon an iterative research approach, with each succeeding stage of research being guided by previous findings (Charmaz, 2006; Glaser, 2008; Zarif, 2012). Based upon this research outcome, a second stage of research was conducted using elite interviews. The elite interviews were conducted with fourteen executives from seven firms representing a majority of the revenues for the OP Industry. This phase of the research used a qualitative methodology in order to explore in depth the difference in results identified in the QGT phase of research. The results of this research are discussed in the second paper: 'Servitization Intent and Dissonance of this Intent as a Servitization Factor' (Crowley, Burton and Zolkiewski, 2018b).

1.4.2 Paper 2: 'Servitization Intent as a Factor in the Servitization Process'

My second paper (Crowley, Burton and Zolkiewski, 2018b) describes the results of the second stage of research, which utilized elite interviews to identify the servitization intent within the organization and to identify how dissonance in this intent can create a

barrier to servitization. By identifying a cognitive factor as a barrier to servitization, this research expands upon the role of the individual in the servitization process (Lenka *et al.*, 2018a), and brings new perspective to the importance of developing a service orientation at the individual level (Rese and Maiwald, 2013) as well as focusing on individual cognitive factors impacting on servitization, as in the case of trust factors (Huff and Kelley, 2003).

The paper utilizes elite interviews from a cross section of the top firms in the imaging industry (see Table 2) to explore in depth, the barriers and drivers of servitization. Elite interviews were purposively selected based upon their ability to provide insights into both cognitive frameworks and management decision making (Welch *et al.*, 2002; Hochschild, 2015). Purposeful sampling is useful as a means of focusing the population and sample to a meaningful and relevant group of interviewees (Poulis, Poulis and Plakoyiannaki, 2013).

Table 2 - Elite Interview Profiles

Company	Level	Scope	Role	2013	
				North America Market Share (Products)	Global Market Share (Direct MPS)
Company A	EVP	Global	Head of Strategy, Planning, and AP Region	21%	27%
Company B	Director	Europe	Head of Marketing (Europe)	14%	19%
	GM	Global	Head of MPS globally		
	Director	Global	Head of MPS Operations Globally		
Company C	Executive VP/GM	Global	Head of MPS globally	22%	16%
	Vice President	Regional - Europe	Sales VP		
Company D	Product Manager	Global	MFP Products	1%	2%
	Director	Regional - USA	Channels Director		
	Director	Global	Head of MPS globally		
	Director	Europe	Head of Marketing (Europe)		
Company E	Director	Global	MPS Operations	3%	7%
Company F	Vice President	Regional - USA	Services/Sales VP	6%	4%
	Executive VP/GM	Global	Board Member, Head of Services Globally		
Total				67%	75%

This research addresses three research questions including RQ1: Are there barriers relating to converting servitization intent into servitization outcome; RQ2: What are they; and RQ3: What are the mechanisms for overcoming these barriers? These questions emerged from the first phase of research which indicated there was a difference or barrier which resulted in Japanese firms having a lower level of servitization versus US firms despite offering similar services and achieving similar outcomes.

Interview analysis was conducted using NVivo as a tool to assist in both coding and analysing the codes from the interview. Abductive coding (Dubois and Gadde, 2002) was used to analyse the interviews, with the initial 242 individual codes being reduced to 121 codes by combining codes with similar meaning. These codes were then compiled into 8 categorical variables which represented major themes from the interviewers:

1. Barriers to business model change
2. Blending business models

3. Business Model Differences
4. Drivers of business model change
5. Services business model
6. Sustainability of business model
7. Traditional business model
8. Types of transitions

The 'business model' term was used by the respondents describing the shift from a product centric to services centric approach which is consistent with the concept of servitization. However, the respondents were not familiar with the term 'servitization' which is not commonly used in the industry. Thus, (change in) business model served as a proxy for the servitization concept among these respondents. There were three managerial challenges or tensions associated with the categorical codes including a lack of servitization intent, difficulty in overcoming manufacturing intent, and the role managerial experience played in limiting servitization intention.

The respondents identified servitization intent as important to successful servitization efforts, while acknowledging the lack of this intent in the organization represented a significant barrier to servitization. Interestingly, the lack of servitization intent could be present either in the broader organization, or in the top management team. Thus, the hierarchical level associated with the lack of servitization intent seemed to play less of a role than the dissonance of servitization intent within the organization.

Mantere & Sillince (2007) identify organization intent as the coherence of intent within the organization. For some organizations in the study, their manufacturing culture acted as driver of organization intent to remain a manufacturer, creating a dissonance with the servitization intent expressed by respondents in the study. In at least one case, the dissonance is so strong as to create a perception that the servitization effort has failed. As a result, this firm is shifting its focus back to products from services, representing a case of reverse servitization (Finne, Brax and Holmström, 2013).

The executive's tenure in the OP industry was a factor in the executives' cognition towards servitization, with executives with strong OP Industry tenure having a much stronger focus on overcoming the barriers to servitization, while executives outside the industry were actively focused on changing the firm's business model in order to achieve their servitization intent (aspirations). This difference in cognitive focus related to servitization may reflect cognitive biases related to executive tenure in the industry (Hambrick, Geletkanycz and Fredrickson, 1993).

In order to overcome this dissonance in servitization intent, respondents identified several structural approaches which have been addressed by existing research such as creating separate groups or business units to focus on services (Kucza, Kucza and Gebauer, 2011), staff behavioural modification efforts (Buschmeyer, Schuh and Wentzel, 2016), and ensuring top management commitment. While these approaches are recognized as approaches to addressing servitization barriers they do not explicitly address the issue of overcoming the cognitive servitization barrier of dissonance in servitization intent. One respondent used the term ‘organizational gravity’ to describe the difficulty in shifting organizational intent from a manufacturing focus to a servitization focus. Furthermore, the respondent identified this gravity as being a drag on the servitization effort which deflects the servitization trajectory (in a negative way).

The research acknowledges that path dependency may be one element of the dissonance in strategic intent, and by creating a shift in the culture it may be possible to change the focus for the organization to a unified focus on servitization intent. Additionally, recruiting top executives from outside of the industry may reduce the dissonance in servitization intent by moving outside the existing cognitive paradigms of executives within the industry.

The key contribution of this research was to identify the concept of servitization intent, and to determine the role it has in relation to organization intent on the servitization process. By identifying and elaborating upon the three managerial tensions associated with dissonance in servitization intent, the research is able to propose several strategies for overcoming these tensions. It provides further support for the importance of understanding managerial cognition consistent with the need identified to address managerial cognition in strategic management research (Stubbart, 1989).

1.4.3 Paper 3: The Role of National Culture as a Cognitive Factor in Servitization

This paper (Crowley, Burton and Zolkiewski, 2018a) builds upon data from Paper 1: *Grounded Theory in Research the Office Products Industry* to examine the following research questions:

RQ1: How has the level of servitization evolved for the OP Industry as a whole and for individual or groups of firms within the industry?

RQ2: If the OP industry as a whole is servitizing, is the servitization process consistent for all firms within the industry (or groups of firms within the industry) or are there differences in how firms servitize?

These questions were driven by my experience as a practitioner and very limited literature review (consistent with the principle of informed inquiry, but limited to prevent apriori theorizing (Glaser and Strauss, 2008; Thornberg, 2012)). While the first paper focused on the methodological approach used to answer these two research questions, this paper focuses upon the results of the mixed methods study. The first finding and a key index used throughout the study was the level of servitization found in the OP industry. The OP industry has a long history of servitization beginning with Xerox in the early 1960's (Finne, Brax and Holmström, 2013), but subsequently went through a period of reverse servitization due to government regulation (Finne, Brax and Holmström, 2013), and more recently has gone through another wave of servitization resulting in a servitization level higher than in most industries (Santamaría, Jesús Nieto and Miles, 2012). By 2012, the servitization level of the OP industry had reached 23%, more than doubling in a five-year period as shown in Table 3.

Table 3 - Servitization Level of the OP Industry

	2008	2009	2010	2011	2012
Servitization %	10%	14%	18%	20%	23%

Sources: Publicly released financial statements, (Stewart 2012), MPS market report (Photizo Group, 2013)

The results from the MPS Decision Maker Tracking Study (Photizo Group, 2012) indicated that whilst the OP Industry firms were offering the same types of service offerings and achieving the same results, firms with headquarters locations in Japan were not receiving the same level of service revenue growth, resulting in a lower rate of servitization (as defined by service revenues divided by total revenues) relative to firms headquartered in North America. This apparent dichotomy of results versus similar efforts indicated that Japanese firms have hidden, or un-identified barriers to servitization. The results of this analysis are shown in Table 4.

Table 4 - Servitization Percentage by HQ Location

	Year				
	2008	2009	2010	2011	2012
American	16%	23%	30%	34%	39%
Japanese	5%	8%	9%	10%	11%
Difference	-11%	-15%	-21%	-24%	-28%
Industry Average	10%	14%	18%	20%	23%

Source: (Photizo 2012)

Further exploration in the results from the second wave of the study identified twelve cognitive factors associated with servitization including: 'what is valued', 'tradition', 'belief in services', 'risk tolerance', 'intentionality', 'desire', 'change tolerance', 'perspective to service', 'trust', 'knowledge', 'commitment' and 'conflicted management direction'. Of these twelve factors, nine had differences between respondents from organizations with headquarters in Japan and those organizations with headquarters in North America. These nine factors were: 'what is valued', 'tradition', 'belief in services', 'risk tolerance', 'intentionality', 'change tolerance', 'desire', 'perspective to service', and 'trust'. This research posits that these cognitive factors are influenced by national culture. A number of cognitive factors were consistent regardless of headquarters location including: 'knowledge', 'commitment', and 'conflicted management direction'.

An example of a cognitive factor related to the perception of service cognitive factor is the Japanese concept of 'omotenashi'. Omotenashi is defined as the desire to "fulfil the guest's requirements by presenting super services from the core of the heart without expectation of any return" (Belal, Shirahada and Kosaka, 2013, p. 29), which one respondent explained as the concept that as a service provider you always provide more than what was contracted for. This represents a challenge in scaling services since capturing the full value of the service requires 'bounding the service delivery terms', which inherently conflicts with the omatenashi concept. In North America, confining the service delivery to the terms defined and bounded by the 'statement of work' or other contractual agreement is considered normal business practice, which fits with Hofstede's (2011) notion of individualistic cultures.

Hofstede's (1985) seminal work on national culture differences impacting business culture did not address the impact of national culture on servitization efforts. However, by comparing the nine cognitive factors identified in this study which varied between groups with the study of national culture to Hofstede's (1985) model of American and Japanese values, the author developed a hypothesized impact for each hidden factor. The results of this work suggest that Japanese firms may be suffering from the servitization paradox (Benedetinni and Neely, 2010) in part due to these cognitive factors.

By analysing servitization at an industry level, this research is able to identify how the national culture associated with the headquarters location for OP Industry firms is influencing the firm's organization culture (globally) and subsequently the firm's ability to servitize. It also raises cognitive factors as important considerations that have the ability to impact the results of firm's servitization efforts. The results of this research have

implications at both an organizational level and a national policy level. At an organizational level this research demonstrates that building a service organization and offerings is not enough to guarantee manufacturers the growth of services revenue required to overcome the potential servitization paradox and create a sustainable level of servitization. At the national policy level, this research indicates that as more organizations and industries servitize resulting in services becoming more important to countries' economies (Buera and Kaboski, 2009), national policy will have to address these hidden servitization barriers in order to maintain the competitiveness of their manufacturing industries (Bajpai and Radjou, 1999).

In order to break free of the cultural resistance, or gravity, associated with a manufacturing culture, firms and national policy makers must identify ways to create velocity to break free from traditional organizational and national cultural constraints to foster servitization growth. Servitization requires a change in corporate culture which is a difficult task (Dubruc, Peillon and Farah, 2014). This research posits that without addressing the cognitive factors, this is an even more difficult task and efforts to servitize may fail. To avoid this, firms must first recognize these cognitive factors and develop programs to address them. This can include recruiting executives from outside of the manufacturing industries in order to bring new, fresh perspectives to the organization and to avoid entrenched industry paradigms. It also requires further research to quantify the cognitive factors and further explore the relationships and strength of these hidden factors relative to national culture. Furthermore, this research would benefit from studies in other industries to validate the applicability of these findings across industries.

An important aspect of this research is the grounded theory approach using mixed methods (quantitative and qualitative) which was used to develop these findings. In order to fully articulate the research approach, the next section will provide further perspectives on the methodological and epistemological positions associated with this research beyond the research methods described in the three research papers.

1.5 Methodological Approach and Perspectives

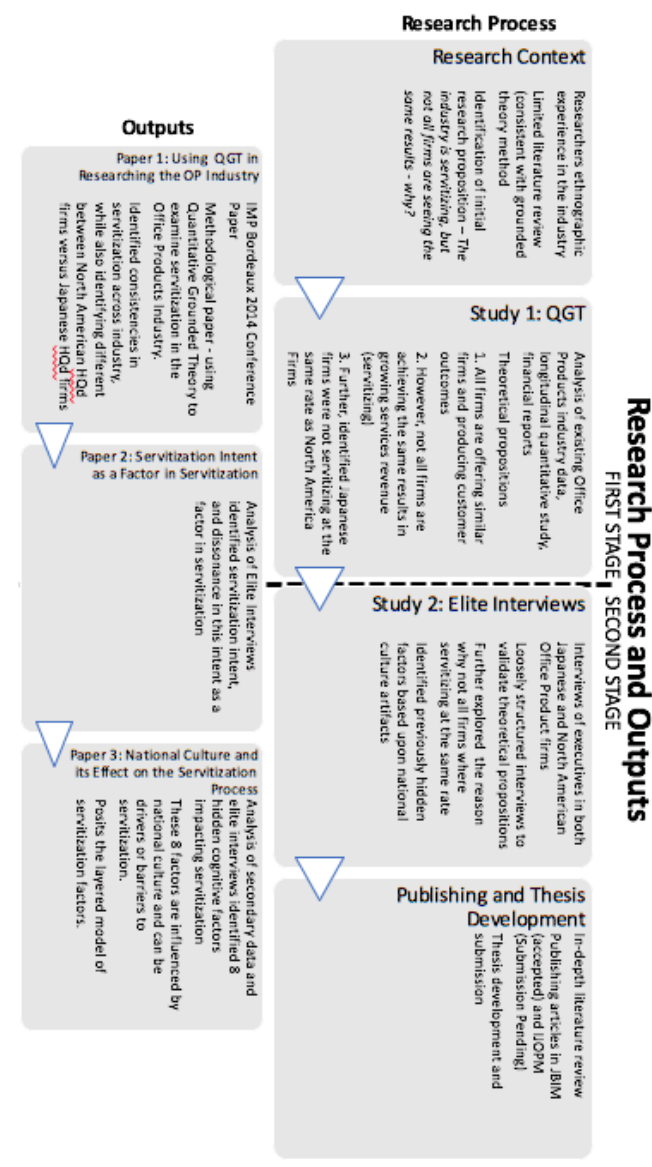
1.5.1 Evolutionary Research Design

I began the research process with over 20 years' experience in the Office Products industry both with manufacturers and as a leading industry consultant. While my experience with manufacturers provided insight into the dynamics of industry decision making, the research and consulting experience provided deep insight into the plans, strategies, and challenges that OP firms as a whole were facing as they began the servitization process. Furthermore, this provided access to top executives in the industry in addition to providing

a rich set of data to use in analysing the industry. This combination provided a rich ethnographic-like basis for the research design.

The interaction between myself in a dual role as an academic (doctorate student) and practitioner, with my research supervisors, and with the reviewers of submitted articles was a very powerful force in shaping the research results and providing clarity and academic rigor to this research process. It is consistent with calls for increased collaboration between academics and practitioners in order to create and transfer knowledge (Rynes, Bartunek and Daft, 2007). As shown in Figure 2 the research process consisted of a mixed methods approach using QGT and qualitative grounded theory (Elite Interviews).

Figure 2 - Research Process and Outputs



This process produced three outputs: a conference paper on QGT methodology: *Using Grounded Theory in Researching the Office Products Industry* (Crowley, Burton and Zolkiewski, 2014b), an article accepted in the Journal of Business and Industrial Marketing: *Servitization Intent as a Factor in the Servitization Process* (Crowley, Burton and Zolkiewski, 2018b), and a research article to be submitted to the International Journal of Operations and Production Management: *National Culture as a Barrier to Servitization: A Layered Model For Factors in Servitization* (Crowley, Burton and Zolkiewski, 2018a).

Since the methods, data, and analytical techniques are covered in-depth in the conference papers and articles included in this thesis, rather than duplicate these items, this section will focus upon the research design, methodological, and analytical choices that were made in developing this research and provide context for my ontological and epistemological perspectives and how they changed during the research process.

1.5.2 Ontological and epistemological perspective -An evolving research design

At the beginning of my research, I held a firm objective-positivist (Charmaz, 2006) view of research, and in particular of servitization research. My view was that servitization could be measured objectively (Luoto, Brax and Kohtamäki, 2017), and from these measurements deductions could be made to characterize the dynamics of servitization within the OP industry. This positivist view made the selection of QGT straightforward (even though it is an emergent, abductive method (Glaser and Strauss, 2008)) since using an existing survey data set (the MPS Decision Maker Tracking Study (Photizo Group, 2012)) provided the potential for gaining unique insights into the dynamics of servitization for the OP industry during a period of industry transformation.

While QGT did provide very useful insights into the dynamics of servitization for the OP industry, it was limited in its ability to thoroughly explain the phenomena of why one group of companies headquartered in North America were more successful increasing levels of servitization in their business as measured by percentage of revenues coming from services (Fang, Palmatier and Steenkamp, 2008) relative to another group of companies which were headquartered in Japan. Given the similarity in service offerings, outcomes produced from these service offerings, and the market context in which they were competing (globally, across the same types of customers) there should have been no difference in their servitization levels unless some other, heretofore unrecognized factors were influencing their ability to servitize.

Subsequent research using a qualitative method (elite interviews) combined with inductive analytical techniques (grounded theory thematic analysis of interviews) revealed the nine cognitive factors ('what is valued', 'tradition', 'belief in services', 'risk tolerance', 'intentionality', 'perspectives to service', 'desire', 'change tolerance', and 'trust') which were impacting servitization. In turn, iterative analysis of the data and coding revealed that these factors were linked to the national culture associated with the headquarters location for the organization. Hence, it is concluded that national culture is impacting organizational culture in relationship to the nine cognitive factors linked with servitization.

Thus, by the end of my research I discovered that my view of the research has shifted to a critical realist perspective (Kempster and Parry, 2011) where I can measure some aspects of the 'reality' of servitization (such as the absolute level of servitization), however, this reality has not been fully measured since the participants cognitive outlook and perceptions are also a part of the servitization dynamic, and these outlook and perceptions are not perfectly consistent or aligned making it very difficult to fully measure the true servitization of the firm or the industry. I would argue that much of earlier servitization research has, from a stratification perspective, addressed the highest-level effects such as organization structure, service offerings, and skills and capabilities requirements. More recent research into actors (Aitken, Stringer and Ballantyne, 2012), the non-linear (Martinez *et al.*, 2017) and multi-path (Kowalkowski, Gebauer and Oliva, 2017) process of servitization, and the cognitive factors (Crowley, Burton and Zolkiewski, 2018b; Einola, 2018) associated with servitization are providing deeper insight into the lower-levels of the servitization phenomena and thus expanding servitization theory.

1.5.2.1 Grounded Theory Epistemological Framework

Given the similarities and differences between the different GT schools (classic (Glaser, 2011), evolved (Strauss and Corbin, 1994), and objectivist (Charmaz and Charmaz, 2006)), and the resulting impact on the basic approach to GT including the literature review, coding, and interpretation (LaRossa 2005), it is important for the researcher to define their epistemological frame for the research (Walsh *et al.*, 2015). In the research project outlined here, a classic view (Glaser-based) has been utilized which rests upon a foundation of a positivist view of there being an objective reality which is represented by the data. In addition, this research utilized major foundational procedures which are common to both Glaser and Strauss (Glaser and Strauss, 2008) and which have been identified as "joint collection, coding, and analysis of data, theoretical sampling, constant comparisons,

category and property development, systematic coding, memoing, saturation, and sorting.” (Jones and Noble, 2007, p. 100).

1.5.3 Methodological Choices

The selection of grounded theory as an overall research method was driven by several factors. First, as stated earlier, grounded theory is an approach that can be applied to both quantitative and qualitative research (Glaser, 2008). Onwuegbuzie (2005) argues that quantitative and qualitative methodologies are complimentary and both are required to obtain a full understanding of a phenomena. Grounded theory is particularly well suited to understanding complex relationships and organizational issues such as culture (Pearse and Kanyuangale, 2009), logistics (Mello and Flint, 2011), and due to its ability to address complex strategy issues in a dynamic market setting (Paul and Koen, 2003) such as that present in the OP industry.

Secondly, grounded theory is also inherently iterative in nature (Lingard, Albert and Levinson, 2008) providing a level of flexibility in research design which seeks to understand multi-layered and complex concepts such as servitization. Grounded theory is an ideal method for understanding complex dynamics (Wagner, Lukassen and Mahlendorf, 2010) change and temporality due to its technique of constant comparison (Parry, 1998). Finally, grounded theory’s practical applicability (Martin, 1986; Locke, 2001) can appeal to researchers attempting to encourage implementation of their research findings. The grounded theory approach also provided the opportunity to develop a theoretical framework based upon insights from the data.

Grounded theory is often perceived “*as being entirely within the domain of qualitative research, neglecting the fact that one of the cornerstones of grounded theory method was the quantitative work of Barney Glaser*” (Fernandez *et al.*, 2007, p. 232). Furthermore, Glaser (1999) states that GT works with any data, although, the use of QGT is significantly less frequent (Gligor, Esmark and Lgeci, 2015), whereas examples of qualitative GT studies dominate (Charmaz and Charmaz, 2006; O’Reilly *et al.*, 2012). A review of literature only identified three cases of QGT in B2B research including its use in a study of the Australian ICT market (Fernandez *et al.*, 2007), research e-verse auctions (Lösch, 2006), and understanding networks within venture capital firms (McLean, 1999). Thus, QGT was identified as a potentially unique approach for analysing servitization data which might shed new insight into the data. Another reason for using QGT is the complexity of organizational dynamics associated with servitization (Ahamed *et al.*, 2013; Vendrell-

Herrero *et al.*, 2014) and the need to explore the temporal aspect of servitization (Subramony and Pugh, 2014).

1.5.3.1 Mixed Methods Approach

The use of a mixed methods approach combining quantitative and qualitative research is recognized for its benefit in both fully exploring a complex phenomenon and in providing a method to cross-check results between methodologies to improve the validity of the research (Hantrais, 2014). In addition, the use of qualitative and quantitative research together has been identified as a way to enhance theory building in business research (Shah and Corely, 2006). This combination of quantitative and qualitative methods was essential for this study which required quantitative analysis at the industry level to identify macro servitization dynamics (industry servitization trends) and qualitative analysis of individual companies and groups of companies to fully understand the micro servitization dynamics (cognitive factors). Furthermore, this study applied the mixed methods approach using a grounded theory research design throughout (both qualitative grounded theory and quantitative grounded theory). The use of grounded theory research in a mixed method design is relatively rare and challenging due to the lack of generally accepted best practices for mixed methods grounded theory design (Guetterman *et al.*, 2017). However, the flexibility of the grounded theory approach was extremely helpful in this study in addition to the iterative, exploratory design inherent in grounded theory (Orton, 1997).

This research required the ability to examine the industry longitudinally in order to identify changes over time in servitization levels and offerings. Furthermore, in order to understand servitization of the entire industry, the research required the ability to measure multiple service related metrics (manufacturer servitization level, types of services offered, and the outcomes resulting from these services) across a section of companies that provided compelling representation of the industry as a whole. This required quantitative data including industry financial data and reports, industry market sizing reports (Photizo Group, 2013), and a longitudinal survey of decision makers who were purchasing services from OP industry manufacturers (the MPS Decision Maker Tracking Study (Photizo Group, 2012)). By using secondary data from existing studies and reports, it was possible to develop these quantitative metrics and by using QGT, develop insights from this data (Glaser, 2008).

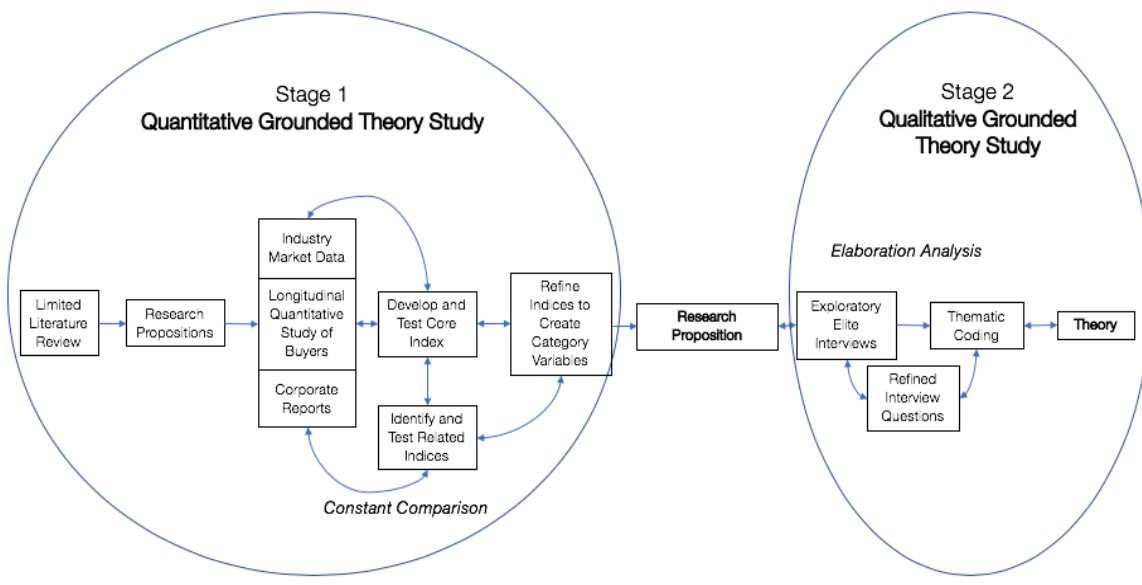
However, in order to understand the micro dynamics associated with servitization at an organization and individual level, a qualitative method was required to understand the causal processes associated with servitization. Elite interviews were selected due to the

potential for top executives (elites) to hold insight into strategy and barriers that may not be available to other members of the organization (Tansey, 2007). While corporate elites are typically very difficult to access, my role as an industry consultant and experience as a practitioner provided the credibility to gain executives trust and obtain interviews (Mikecz, 2012). In part due to my role as a recognized industry consultant, it was possible to create a very open and collaborative approach (Smith, 2006) with the interviewees which resulted in very reflective and thoughtful responses. A flexible, semi-structured interview approach was used in order to meet the requirements of executive elites to have discussions relevant to their business and interests (Kincaid and Bright, 1957). Thirteen elite interviews were conducted across six companies with as few as one interviewee per company and as many as four interviewees per company. The question of sample size is often challenging in qualitative research, with a significant level of disagreement about how many interviews are enough (Baker and Edwards, 2012). In this case, our goal was not to conduct full case studies with saturation levels within a company, but rather, to interview respondents from two groups (North American headquartered companies – four interviews, and Japanese headquartered companies – nine interviews) until no new insights were obtained from the interviewees, or in other words saturation (Charmaz and Charmaz, 2006). For both groups, there was a high degree of consistency in responses and it is interesting that while the respondents were from companies with either Japanese or North American headquarters, the respondents were from a variety of areas including the USA, Japan, and Western Europe with the nationalities being relatively distinct from the headquarters location. For example, the comments about servitization intent within a Japanese headquartered company were very consistent regardless of whether the interviewee was a Japanese national or from another country.

The mixed methods approach was ideal for this research since it enabled the analysis of the macro dynamics of servitization at an industry level while also providing for the deep insights at an organizational and individual level around the cognitive factors associated with this servitization. As the following quote indicates, both the macro (industry level via survey data) and the micro (organizational level via elite interviews) views were required to provide a complete picture of servitization. “Studies that examine how organizational-level events cumulate into a population-level process are essential to determine how change in industries comes about” (Turunen and Finne, 2014).

Figure 3 provides a depiction of the mixed methods design and how the two approaches used separate survey modalities (quantitative and qualitative) while consistently utilizing the grounded theory method through the entire research process.

Figure 3 - GT Mixed Methods Research Design (Glaser, 2008; Glaser and Strauss, 2008)



Utilizing quantitative grounded theory did represent challenges since using quantitative data to develop new theoretical propositions is relatively rare compared to most servitization research which is based upon qualitative exploratory research (Rabetino *et al.*, 2018).

1.5.3.2 Industry level versus firm level research

Recent discussions of theory development in service-dominant logic have identified the need to bridge the meso (industry) and micro (organization or individual) level interactions to expand the scope of current service-dominant logic theory (Vargo and Lusch, 2017). This research expands existing servitization theory by following a similar approach beginning with an industry (meso) view of servitization, and then subsequently linking this to the organizational (micro) view of servitization. There are a very limited number of servitization studies addressing servitization at an industry level. The majority of servitization studies are either cross-industry studies of manufacturers (e.g. Santamaría, Jesús Nieto and Miles, 2012; Schmenner, 2013; Eggert, Thiesbrummel and Deutscher, 2015) or case studies of individual firms (e.g. Spohrer, 2017) or case studies of a small number of firms in unrelated industries (e.g. Witell and Löfgren, 2013).

While the firm's industry of operation has been shown to impact organizational culture and potential for change of this organizational culture due to competition, customer requirements, and social expectations (Gordon, 1991), there is limited understanding of how industry level dynamics impact the servitization process, or how servitization occurs at an industry level. By examining the industry level dynamics, this research provides a new perspective on the macro level of servitization while still linking this macro view to servitization dynamics at an individual organization level.

1.5.3.3 Choosing the Office Products Industry -Selecting A Highly Servitized Industry

Firms within the OP industry have been frequent subjects of servitization research in examining the changes in product service systems due to servitization (Matsumoto and Kamigaki, 2013), reverse servitization (Finne, Brax and Holmström, 2013), the evolution of service offerings (Visintin, 2012; Rapaccini and Visintin, 2014), and the servitization of business models (Chesbrough and Rosenbloom, 2002). The industry is highly servitized as evidenced by less than 4% of capital goods companies always offering pay-for-use services across all industries (Adrodegari *et al.*, 2015) versus 20% offering these services in the OP industry (Photizo Group, 2013). Due to this high level of servitization, it is possible to examine the industry dynamics associated with servitization by examining data representing a majority of the firms in the industry, thereby providing an additional lens through which to examine servitization. The high level of servitization supported the approach of purposeful sampling since experienced executives within the industry provided 'insightful' context for understanding the dynamics being studied (Tranfield, Denyer and Smart, 2003).

1.5.4 Utilizing a Unique Data Source: The MPS Decision Maker Tracking Study

The MPS Decision Maker Tracking Study (Photizo Group, 2012) was selected as the initial data set due to its potential as a rich source of secondary data to understand servitization at an industry level. This data was created for manufacturers within the Office Products (OP) Industry, in order to identify their customer's service contract requirements, competitive brand positions, and other critical metrics (Photizo Group, 2012).

The study's large sample base answers calls for more quantification of the phenomena of servitization (Luoto, Brax and Kohtamäki, 2017) and specifically calls for more longitudinal quantitative research designs (Rabetino *et al.*, 2018). In addition, using secondary data provided an advantage in terms of both the timeliness of available information and also avoiding the costs of a large scale primary study (Cowton, 1998). The study's longitudinal nature made it particularly well suited for understanding transformation

by providing a temporal context for analysis. The combination of longitudinal research, a global study, and grounded theorizing provided an opportunity to address several key service research priorities including understanding employee and organizational issues relative to servitization and understanding service within a global context (Ostrom *et al.*, 2015).

The study is unique in the field of servitization from several respects including;

- It is designed to represent an entire industry (OP Industry) with customers from each of the major manufacturers being represented in the study.
- Additionally, the study was based on customer perception of service offerings from the manufacturers – versus the more common approach of using manufacturer-based studies which provided the manufacturers view of services.
- The longitudinal, global, quantitative nature of the study based upon interviews of 5,913 service customers who were decision makers over a period of five years from 2008 until 2012 in the USA, Canada, UK, Germany, France, Benelux, Australia, China, and India is unique relative to the majority of studies which are focused on the manufacturer's viewpoints.

The papers are included in the following sections.

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2.0 USING GROUNDED THEORY IN RESEARCHING THE OFFICE PRODUCTS INDUSTRY

PAPER PRESENTED AT THE 30TH IMP CONFERENCE
KEDGE BUSINESS SCHOOL, BORDEAUX FRANCE, SEPTEMBER
2014

This article has been modified from the original paper published in the conference proceedings to reflect direction provided during the Thesis defence. The modifications include further clarification of the method for developing indices and removal of an extraneous graphic.

USING GROUNDED THEORY IN RESEARCHING THE OFFICE PRODUCTS INDUSTRY

APPLYING QUANTITATIVE GROUNDED RESEARCH TO UNDERSTAND SERVITIZATION DYNAMICS USING LARGE SAMPLE SIZE LONGITUDINAL SURVEY DATA

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ABSTRACT

This research describes an innovative use of the grounded theory method with quantitative data for industrial research in the Office Products Industry (OPI). The work identifies a methodology that has potential use across a number of industrial research projects. The aim of this research was to understand the process of servitization within the OPI and whether there is a difference in the servitization process for firms within the industry. Using grounded theory, the researchers found that the OPI is becoming increasingly servitized and that the growth of customer-centric results leads the growth of servitization. When companies are separated by headquarters location, the American firms are servitizing at a faster rate and producing more advanced results from services than Japanese firms. The use of quantitative grounded theory has revealed rich data and identified important trends within the OPI. It also has illustrated how industrial secondary data can be analysed through this process and used to explain and expand existing theoretical frameworks. This provides a demonstration of the value of grounded theory in understanding business-to-business issues and provides an indication of the potential for this method in expanding our knowledge of business-to-business theory.

Keywords: Grounded Theory, Quantitative Research, Servitization, Office Products

Industry, Japanese Manufacturing

1.1 Introduction

1.1 Object of research: Office Products Industry and servitization

Servitization is defined as "The transformation processes whereby a company shifts from a product-centric to a service-centric business model and logic." (Kowalkowski et al., 2017, p. 7). The level of a firm's servitization can be measured by dividing the service revenue by the company (or divisions) total level of revenue (Fang, Palmatier, and Steenkamp, 2008)." The research aim for the study was to examine the servitization of an industry (Office Products Industry or OPI) and to understand if there is a difference among firms within the OPI in terms of their servitization process.

The OPI consists of firms that manufacture digital printing equipment and supplies. This is also a large industry, with revenues in excess of \$200 billion globally (Jamieson, 2013). Despite predictions of a paperless office (Smart, 1995), printing devices continue to be used by almost every office worker. Although as office workers are shifting to using both paper and digital documents (Guimbretiere, 2003). As a result of this shift the industry is going through a significant transition as the traditional business model is being challenged by new digital workflows which reduce the need for printing and copying (LeCompte, 2013). An example is electronic workflows in hospitals which replace paper intensive processes with digital processes (Adler-Milstein and Bates, 2010). This transition is driving many leading imaging firms such as Xerox and Ricoh to add more value to customers by providing services that move beyond the traditional print offering such as Xerox being the outsourcing provider for the New Jersey Turnpike Authority (Xerox, 2010).

OPI was selected due to the availability of data on the industry to the research team and the increasing importance of services to the industry (Hutchins and Huster, 2010). While firms within the OPI began offering services at about the same time, including the outsourcing and remote management of fleets (called Managed Print Services or MPS), practical experience of the principal researcher suggested that there was a difference between firms in their level of success in servitizing their business. By identifying and understanding the servitization process and how it evolves over time the factors that drive successful servitization at an industry level or individual company level should be revealed. Servitization is defined as the process by which a firm shifts from a product-centric business model to a services centric business model (Kowalkoski et al., 2017) and can be measured by comparing the proportion of service revenue to the total revenue for the business unit or firm (Fang, Palmatier and Steenkemp, 2008). A grounded theory method was chosen due to

its potential for understanding complex dynamics of change in organizations such as the process of servitization (Wagner et al., 2010).

2.0 Grounded Theory Approach

2.1 Defining grounded theory

Grounded theory was first developed by Barney Glaser and Anselm Strauss during their research on dying patients which was published in *Awareness of Dying* (1965). Subsequently grounded theory was detailed by Glaser and Strauss in their book *The Discovery of Grounded Theory* (2008). Grounded theory is unique in two aspects, the first of which is a focus on theory discovery through data analysis (Glaser and Strauss, 2008, p. 2). This discovery process is intended to be an iterative process that occurs with data collection guiding the analysis and vice versa (Bryant and Charmaz, 2007, p.3). The second unique aspect of grounded theory is that it treats all information as emergent, demonstrated by its rejection of a priori theorizing (Locke, 2001, p. 34).

While it rejects a priori theorizing, there is recognition that prior knowledge and a review of literature may help frame the research question. However, the key concern is to ensure that the research is not contaminated by the existing theory and does not unintentionally shift from creating theory to testing theory. The acknowledgement of this and the resultant tension has created arguments for delaying the literature review until after the completion of the research (Glaser and Strauss, 2008, p.37). However, as grounded theory has evolved, there is an increasing belief that it is important to conduct an initial literature review resulting in "informed grounded theory" (Thornberg, 2012).

Grounded theory has become the one of most widely used qualitative research methods (Bryant and Charmaz, 2007, p. 47), yet there are relatively few business-to-business research papers adopting this method, with many recent papers favouring an abductive approach (Anna Dubois, 2002, Dubois and Gadde, 2014).

2.2 Using grounded theory with quantitative data

While there are many examples of using a grounded theory to analyse qualitative data (Curtis et al., 2000, Charmaz, 2006, O'Reilly et al., 2012, Kan and Parry, 2004), the use of quantitative grounded theory is less common. However, grounded theory was intended to be a general method that could be used with either qualitative or quantitative data. Glaser (1999, p. 842) states that: "grounded theory is a general method. It can be used on any data or combination of data. It was developed partially by me with quantitative data." In order to support a growing demand for quantitative grounded theory, Glaser published a book in

2008 devoted to this topic *Doing Quantitative Grounded Theory*, further validating quantitative grounded theory as an approach. The purpose of quantitative grounded theory is the same as using grounded theory with qualitative data, specifically to generate theory (Elliott and Higgins, 2012). In fact Glaser (2008, p. 186) makes a compelling statement about the potential of quantitative grounded theory in this regard, “The freedom and flexibility that we claim for generating theory from quantitative data will lead to new strategies and styles of quantitative analysis, with their own rules yet to be discovered.”

2.3 Quantitative grounded theory as a tool for industrial research

While Glaser and Strauss initially developed grounded theory for use in social science research (Glaser and Strauss, 2008, p.3), grounded theory has also been identified as well suited for use in industrial research. Multiple authors (McLean, 1999, McLoughlin and Burca, 1995, Locke, 2001, p. 95, Wagner et al., 2010) have proposed that grounded theory is particularly helpful in industrial research because it is so well suited for understanding the complex dynamics of transitions in firms or industries. Wagner et al. (2010) expand this argument to say that grounded theory is very well suited for studying industrial organizations as exemplified by its origination and historical use in studying the complexities of healthcare organizations. Martin (1986) adds that in addition to capturing complexity well, grounded theory also links well to practice since it helps the study participants gain a better understanding of their own organization.

Given these factors, one would expect grounded theory to be widely used as a method for examining quantitative data in industrial research in order to understand complex industry dynamics, or in other words, for there to be more industrial quantitative grounded theory. However, while researchers such as (Locke, 2001, p.95), Wagner et al. (2010), and Martin (1986) cite the value of using grounded theory in industrial research, in each case this usage is based within the context of using grounded theory with qualitative research. An exhaustive review found only a few papers which used quantitative grounded theory in industrial research (Edmondson et al., 2001, Sandelowski, 2000, Kan and Parry, 2004), creating a significant missed opportunity for new theory creation.

2.4 Why use quantitative grounded theory for this research?

A key appeal of quantitative grounded theory for this research was the availability of a quantitative, global research study (Photizo Group, 2012). Historically this survey data had been used to provide manufacturers within the Office Products Industry (OPI) with ongoing tracking of customer requirements for service contracts, their relative brand positions, and other key market management metrics. Glaser (2008) identifies data which

was collected for another purpose as a primary source of secondary quantitative grounded theory data.

A secondary appeal is the suitability of quantitative grounded theory in industrial research. Quantitative grounded theory provides the potential to address the complex issue of how an industry becomes servitized because it can be used to study complex systems and help develop insightful theory about difficult organizational issues such as the transformation associated with servitization. In addition, as previously outlined the aspect of the grounded theory linking well to practice (Locke, 2001, p. 95, Martin, 1986) makes this method particularly attractive.

The third reason is that despite the appeal of quantitative grounded theory in industrial research, an extensive search of the literature found only a few instances (Edmondson et al., 2001, Sandelowski, 2000, Kan and Parry, 2004, Jones and Alony, 2011, Lösch, 2006) of using grounded theory with quantitative data for research in industry. As a result, this is a unique opportunity to explore the potential of using a novel method for researching industrial markets.

3.0 Quantitative grounded theory Research Approach

3.1 Epistemological framework

Since both grounded theory and quantitative grounded theory use inductive logic (finding theory from the data) they can be identified as constructivist (Charmaz, 2006). Glaser has positioned grounded theory as a method that could be use regardless of epistemological perspective (Holton, 2011, p. 219), while Strauss has positioned grounded theory as pragmatistic (Corgin and Strauss, 1990). This research will follow the objectivist grounded theory model identified by Charmaz (Simmons, 2011, p. 19), where the researcher is an objective neutral.

3.2 Research background and research questions

The research questions were derived on the basis of one of the researcher's practical experience in the industry and from a preliminary literature review. While Glaser (2008, p. 11) clearly articulates the need to avoid inadvertently shifting from theory development to theory testing due to an undue focus on a priori review of literature and existing theory, it is reasonable to utilize professional experience and a preliminary literature review in order to frame the research questions (Elliott and Higgins, 2012, Thornberg, 2012). Whether or not to delay the literature review is an item of much debate in discussing grounded theory. Strübing (2013, p. 56-57) argues that the intent as defined in the original text *The Discovery of Grounded Theory* (Glaser and Strauss, 2008) is not for the researcher to have no practice

or theoretical knowledge of the subject, but rather, that the prior knowledge does not overwhelm the data and subvert the theory generation process. For this reason, only a limited literature review was conducted to ensure familiarity with major themes and topics in the area of servitization. The full literature review was postponed until the completion of the study in order to avoid the trap of shifting from theory development to theory testing.

The research questions were:

What is the servitization process for the OPI?

Is the OPI becoming more servitized over time?

3.3 Research data sources

The study utilised a grounded approach to analyse existing service agreement data from a large, multi-country longitudinal study of the OPI, financial data from OPI firms public report filings, and OPI service revenue data from a leading industry data firm. The longitudinal study used in this research is the Decision Maker Tracking Study™ or DMTS (Photizo Group, 2012) which was conducted from 2008 through 2012 in North America, Western Europe, and Asia with 5,913 corporate decision makers who are responsible for obtaining and managing service agreements with providers of services for Office Products (printers, copiers, multi-function devices, and document management systems). Study participants were randomly drawn from large business-to-business research panels including uSamp™ and Luth Research. The respondents were then screened to ensure they were qualified based upon their involvement in the acquisition and management of these service contracts. Financial data (OPI revenues for each firm in the industry) were collected from public annual report filings by the top 14 firms (as measured by revenue) in the OPI industry (see Appendix 1). The services data was provided by a leading market tracking firm for the OPI industry (Stewart, 2012) and included service revenues for each of the top firms. This type of triangulation of multiple data sources is recommended in conducting grounded theory (Locke, 2001, p. 47).

The DMTS study was conducted on a multi-client basis and thus fully funded before this research work began. Glaser encourages the use of existing studies as a source for quantitative grounded theory (Glaser, 2008, p. 33). The original purpose of the DMTS study was to provide a comprehensive, global view of the key market metrics such as service brand awareness and services satisfaction in order to assist manufacturers in managing their service branding and marketing programs (Crowley, 2013, Huster, 2011). This original purpose is different to the purpose of the current research which is to understand the servitization of the OPI industry. This difference in the original focus and current research is positive in that

it helps keep the researcher from being drawn into the original study purpose which is one of the pitfalls identified by Glaser (2008, p. 35) due to its potential for shifting the researchers perspective from theory creation to theory testing.

The first step in evaluating this data as a source for quantitative grounded theory is to ensure that the data is adequate for the study. Adequacy can generally be defined as having ‘enough’ data and in the relevance of the sample to the phenomena being studied (Corgin and Strauss, 1990). The challenge of establishing how much data is enough for grounded theory is problematic, however, general consensus (Jones and Alony, 2011, Locke, 2001, p. 53, Bruce, 2007) appears to be that the optimal point is the saturation point at which no further findings are generated and this approach was adopted in this research.

3.4 Identifying indices

The core of quantitative grounded theory lies in identifying indices (or variables) that will generate theory. The approach adopted in this analysis was to begin by comparing variables in the data to identify if there was any relationship (Glaser, 2008) to the topics of the study. Again, the topics for this study were servitization (as measured by the percent of service revenues to total revenues) and differences in how firms servitized within the industry. Once these crude indices are identified, they are compared in iterative fashions to ensure they have a directional relationship to the study concept (Glaser, 2008).

The first variable analysed was the aggregate level of service revenues for the top 14 OPI firms to total revenues for the top 14 OPI firms. The total service revenues were summed and then divided by the total revenues in order to create a percentage of services figure, or level of servitization (Fang et al., 2008). This percent of services did increase over time, indicating the OPI industry is becoming more servitized with time as shown in Table 6 making servitization the first index.

The next variable which was analysed was (Q31) from the Decision Maker Tracking Study™ (Photizo Group, 2012), “In regards to your fleet of imaging devices, which of the following do you feel you have accomplished?” (Photizo Group, 2012). The results were represented in terms of the percentage of respondents who acknowledged having accomplished specific activities such as having centralized the decision making for all of (devices in) the fleet.

Next, individual response variables were combined into categories based identification of common themes which are summarized below:

1. **Control of devices** (product focused) such as performing an assessment of the fleet composition and deployment.

2. **Optimization and management of devices** (product focused) such as adjusting the size of the fleet in order to optimize the ratio of devices to employees.
3. **Business process improvement** (outcome focused) such as implementing document capture and routing capabilities to improve (but not modify) the business process.
4. **Business process optimization** (outcome focused) such as engaging a vendor to evaluate a business process and identify ways to modify it and make it more efficient.

The themes were compared to existing service groups (Uлага & Reinartz, 2011) for validation as shown in Table 7. The thematic coding was highly consistent with existing service groupings.

These results were then examined in a frequency table which indicated that there was growth in all of the service results, except for Stage 1 service results (See Table 8). However, the service results that did grow did not grow at the same rate, indicating a need to further collapse the variables in order to identify the underlying factor.

In order to further analyse the directional relationship of the types of service results, the four service results were further categorised (Table 9) based upon their focus being either product centric (labelled as product-centric) or customer-centric (labelled as customer-centric). The two indices (product-centric and customer-centric) were compared over the study horizon (2008 to 2011) in order to determine how they individually changed over time. The customer-centric-results did increase over time at a much greater rate than the product-centric results (see Table 10) and as such customer-centric results were included as the second index. These two broad categories of results (product-centric versus customer-centric) are consistent with the service focus typologies proposed by other researchers in servitization (Uлага and Reinartz, 2011, Gaiardelli et al., 2013, Tuli et al., 2007).

Next, the servitization and customer-centric indices were compared in order to see if their relationship was directionally the same. The results did indicate that both results moved together directionally to increase over time. However, customer-centric results did increase at a much faster rate than servitization.

Finally, the servitization index and the customer-centric results index were further compared by analysing each index by separating the underlying data into two groups: firms headquartered in America versus firms headquartered in Japan. This created four sub-indices: Japanese firm servitization, Japanese firm customer-centric results, American firm

servitization, and American firm customer-centric results. In this analysis, all four sub-indices did increase over time indicating a positive relationship. However, the American firm's level of servitization and customer-centric services increased at a much faster rate. The results of the four sub-indices are shown in Table 11. The movement of all of the measures in the same direction (albeit at different rates) is a good indication that these are valid indices since one measure of the validity of indices in grounded theory is whether there is a consistent relationship among multiple indices, such as is the case in these results (Glaser, 2008).

4.0 Discussion

4.1 Analysis

Based upon this data I can make several specific observations about the indices including the following:

1. The OPI industry is increasing its level of servitization over time.
2. The level of advanced results increased over time.
3. The level of advanced results increased faster than the rate of servitization.
4. American firms have increased their level of servitization and their proportion of advanced results faster than Japanese firms.

There are also several statements which can be made about the relationship of the indices to each other. While both servitization and customer-centric results increased over time, customer-centric results increased at a much faster rate. In addition, the headquarters location index did show a relationship between Japanese and American firms with American firms becoming more servitized and producing customer-results at a faster rate than Japanese firms. Over the horizon of this research project the gap has doubled for both servitization and customer-centric results. Since service offerings are believed to be providing manufacturers with a competitive advantage (Gebauer et al., 2011, Kindström, 2010, Visnjic et al.), this finding represents a serious challenge for Japanese firms since it could equate to an increase in competitive disadvantage.

A number of authors have speculated that, in general, Japanese firms face unique challenges in servitization due to cultural or decision making elements, although these authors have not conducted specific research to measure the difference between Japanese and non-Japanese firms in servitization (Ström and Mattsson, 2005, Hidaka, 2006, Abe, 2005). This study does not provide conclusive data as to why Japanese firms are lagging

American firms in their level of servitization or in the growth of their customer-centric services, however, it does indicate that a gap does exist within the OPI.

4.2 Areas for theoretical development

Based upon these results, two important areas have emerged that require further theorization and investigation. The first area is that the level of servitization and the level of customer-centric results from services for the OP Industry appear to be related. This would also seem to indicate that the growth of customer-centric service results leads to increased servitization.

The second area is that the findings indicate that it is more difficult for Japanese OPI firms to servitize their businesses than American OPI firms both in terms of the level of servitization and in terms of driving the growth of customer-centric services.

To date the majority of servitization research has focused on the services being offered by service vendors (Kowalkowski et al., 2013, Gaiardelli et al., 2013, Ulaga and Reinartz, 2011, Tuli et al., 2007) versus this study which examines the results of these services, or outcomes, from the customer's perspective. The end customer perspective has important implications since a customer value driven, versus producer offering driven perspective has significant implications for the production model developed by the manufacturer (Siraliova et al., 2011).

4.3 Potential impact of grounded theory in Business-to-Business research

The embedding of electronics into every day devices (also called smart devices) that are connected to the internet creating a global network of interconnected smart devices is referred to as the Internet of Things (IoT) (Miorandi et al., 2012). Examples of the business-to-business applications presented by IoT include electronic payment systems (Laya et al., 2013), monitoring of IoT connected devices as a business-to-business service offering (also called Sensing as a Service) (Zaslavsky et al., 2013), and predictive monitoring enabled through IoT in transportation and logistics (Metzger et al., 2012). The IoT is creating massive amounts of data from intelligent devices which offer opportunities for exploration and potentially theory development (Grubic, 2014).

The IoT is affecting almost every industry and even creating new business models (Haller and Magerkurth, 2011). This explosion of data is driving a growing need for new and innovative methods for extracting insights from the data (Friess, 2011, p. 14) in order to turn the data into useful theory which can ultimately be applied to developing new business models and generating new service offerings (Leminen et al., 2012). As an example Leminen et al. (2012, p. 23) states, "there is a need for research that reveals the embedded

structures and creates comprehensive understanding of the networked IOT business models, as well as depicts the roles of diverse IOT actors and the dynamics of mega-ecosystems, in which different industries and clusters are integrated into a large ecosystem”.

Quantitative grounded theory has the potential to become increasingly important as a tool for industrial research based upon its inductive nature and suitability in identifying theory in quantitative data (Glaser and Strauss, 2008, p. 185). The inductive nature of grounded theory also makes it well suited for many types of process data (which can include IoT data) (Langley, 1999) such as IoT data. This study provides one example of using grounded theory to gain insights from industrial data. The growing mass of business-to-business IoT data may provide many additional opportunities for the application of grounded theory to quantitative data.

4.4 Limitations and future research

The findings from this study relate to the evolution of servitization and differences between American and Japanese firms in their respective evolution to servitization. Further research is needed to elaborate this and will be undertaken using detailed case studies as the next phase of the research. This is the analysis called for by Glaser and Strauss (2008, p. 205) to further refine the theory and identify the reasons for the relationships between variables. It should be noted that the data source is specific to the OP Industry. As such, the results are limited to this industry and it is difficult to extrapolate this same theory to other industries.

Appendix 1 – Top Imaging Firms

Table 5 - Imaging Firms

Company	Included in Study	Headquarters Location	Q4 2012 Imaging Revenues
HP	Yes	America	\$6,080(M)
Canon	Yes	Japan	\$4,225(M)
Ricoh	Yes	Japan	\$3,649(M)
Xerox	Yes	America	\$3,473(M)
Epson	No	Japan	\$1,716(M)
Konica Minolta	Yes	Japan	\$1,448(M)
Lexmark	Yes	America	\$920(M)
Brother	Yes	Japan	\$848(M)
Kyocera	Yes	Japan	\$627(M)
Oki	Yes	Japan	\$273(M)
Samsung	Yes	Korea	<i>These companies do not separate their print and imaging revenues, so exact revenue numbers are unknown.</i>
Toshiba	Yes	Japan	
Sharp	Yes	Japan	
Dell	Yes	America	

Sources:

Headquarters Location: Public Filings

Imaging Revenues: 10K Statements / Public Financial Statements

Epson was not included in the study because they are the only firm without a services (MPS) offering.

Appendix 2 - Tables and Illustrations

Table 6 – % of Service / Servitization

	2008	2009	2010	2011
Servitization %	7.1%	7.9%	9.0%	10.5%

Table 7 – Types of Services

(Q31) In regards to your fleet of imaging devices, which of the following do you feel you have accomplished?

LABEL	SERVICE OUTCOME	ULAGA & REINARTZ
Control -Product Focus	Q31_1: Understands the cost for all hardcopy devices Q31_2: Has centralized decision making for the entire fleet Q31_3: Has assessed the fleet Q31_6: Has implemented a plan with the vendor for ongoing, proactive monitoring of the fleet	Product Live-Cycle Services (PLS) Service to facilitate the customer's access to the suppliers good and to ensure its proper functioning.
Optimize and Manage - Product Focused	Q31_5: Has made efforts to reduce hardcopy costs Q31_10 Has taken steps to assure have right size fleet: Q31_4: Has taken steps to consolidate the fleet and adjust the device per employee	Asset Efficiency Services (AES) Services to achieve productive gains from assets invested by customers.
Enhance and Business Process Improvement - Outcome Focused	Q31_7: Has implemented new document capture capabilities such as scanning documents and automatically routing them to pre-defined recipients or archives Q31_12 Has created doc of the workflow capability of the fleet: Q31_13 Has modified business workflows using document management solutions and training:	Process Support Services (PSS) Services to assist customers in improving their own business processes.
Integration and Business Process Optimization - Outcome Focused	Q31_8: Has engaged with a vendor to conduct an analysis of the business process in order to identify ways to make these processes more efficient Q31_9: Based upon the results of a workflow process analysis, has engaged a vendor to improve these processes by implementing document related technology which results in a more efficient process Q31_11 Has optimized one or more business processes:	Process Delegation Services (PDS) Service to perform processes on behalf of customers.

Table 8 – Tabulation by Year

	Control - PF	Optimize - PF	Enhance - OF	Optimize - OF
2008	51%	46%	20%	18%
2009	61%	49%	27%	27%
2010	49%	47%	31%	30%
2011	48%	50%	31%	24%

Table 9 – Index Categorization

(Q31) In regards to your fleet of imaging devices, which of the following do you feel you have accomplished?		
PRODUCT-CENTRIC	Control - Product Focus	Q31_1: Understands the cost for all hardcopy devices Q31_2: Has centralized decision making for the entire fleet Q31_3: Has assessed the fleet Q31_6: Has implemented a plan with the vendor for ongoing, proactive monitoring of the fleet
	Optimize and Manage - Product Focused	Q31_5: Has made efforts to reduce hardcopy costs Q31_10 Has taken steps to assure have right size fleet: Q31_4: Has taken steps to consolidate the fleet and adjust the device per employee
CUSTOMER-CENTRIC	Enhance and Business Process Improvement - Outcome Focused	Q31_7: Has implemented new document capture capabilities such as scanning documents and automatically routing them to pre-defined recipients or archives Q31_12 Has created doc of the workflow capability of the fleet: Q31_13 Has modified business workflows using document management solutions and training:
	Integration and Business Process Optimization - Outcome Focused	Q31_8: Has engaged with a vendor to conduct an analysis of the business process in order to identify ways to make these processes more efficient Q31_9: Based upon the results of a workflow process analysis, has engaged a vendor to improve these processes by implementing document related technology which results in a more efficient process Q31_11 Has optimized one or more business processes:

Table 10 – Product-Centric vs. Customer-Centric Results

	2008	2009	2010	2011	Growth
Product Centric	49%	55%	48%	49%	1%
Customer Centric	19%	27%	31%	28%	9%

Table 11 - Japan vs. American Servitization

	Year			
	2008	2009	2010	2011
Per cent of OPI Vendor Contracts with Customer-Centric Results				
American	21%	30%	31%	36%
Japanese	19%	25%	29%	25%
Difference	-2%	-5%	-2%	-11%
Industry Average	19%	27%	30%	28%
Per cent of OPI Vendor Servitization				
American	10%	10%	13%	15%
Japanese	7%	8%	8%	9%
Difference	-3%	-2%	-5%	-6%
Industry Average	7%	8%	9%	11%

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3.0 Servitization Intent as a Factor in the Servitization Process

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Servitization intent as a factor in the servitization process

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Abstract

Purpose – This paper aims to investigate the role of servitization intent in the servitization process, and specifically the role dissonance (at an organizational level) in servitization intent can play in creating barriers to the servitization effort. Servitization intent is defined as the desire to achieve a future state of increased servitization.

Design/methodology/approach – The research uses elite interviews and secondary data to explore servitization intent and its role during the servitization process. It examines the resistance to change resulting from a misalignment of the executive intent to servitize, and the organizational intent to retain the existing manufacturing business model. By encompassing data from companies representing a significant portion of the total industry (as measured by revenue), the study provides an industry level perspective of servitization intent and alignment.

Findings – Servitization intent and three key managerial challenges related to servitization intent that act as barriers to servitization were identified: lack of servitization intent, overcoming the manufacturing mindset associated with the organizational intent and the constraints resulting from managerial experience. Servitization intent and its associated managerial challenges were present at an industry level with consistent findings being shown across the major firms in the industry studied. A number of managerial strategies for overcoming these barriers were identified.

Research limitations/implications – The research focuses on a single industry; the findings, potentially, have application across a broad range of industries.

Practical implications – A key management implication from these findings is the need for a clear understanding of the organizational intent in relation to servitization in addition to the need to bring this organizational intent in alignment with the executives' servitization intent.

Originality/value – This research makes a contribution by identifying the misalignment between servitization intent in different levels of the organization during the servitization process and the mechanisms that can improve alignment and help effect servitization.

Keywords Servitization, Strategic intent, Managerial tensions, Organizational strategic intent, Servitization intent

Paper type Research paper

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1.0 INTRODUCTION

Servitization is defined as "The transformation processes whereby a company shifts from a product-centric to a service-centric business model and logic." (Kowalkowski et al., 2017, p. 7). The level of a firm's servitization can be measured by dividing the service revenue by the company (or divisions) total level of revenue (Fang, Palmatier, and Steenkamp, 2008). While servitization is a process, this process is driven by a desire to reach a different, future state; it is a complex and context-dependent with different pathways possible (Burton et al., 2017). This desire to change state is described as intent at an individual level (Searle, 1983; Bratman, 1999), or, intentionality when it is focused on an agent which can be an individual or an organization (Cañibano, Encinar and Muñoz, 2006). We differentiate the term "servitization intent" from the term servitization by describing the former as a cognitive desire (for servitization), rather than an end state or the process of reaching this end state (servitization). An example of servitization intent is Ricoh's announcement of a \$300m investment in services, "Ricoh's investment in its global MDS infrastructure is designed to strengthen its best practices approach and technologies across its global footprint and help the company achieve an annual MDS revenue target of \$3.3 billion USD by FY2013" (Ricoch, 2011, p. 1).

The lack of a unified organizational mindset (servitization intent) toward servitization can be a key internal barrier to servitization and has been described as a logic barrier that applies to the entire organization (Coreynen et al., 2017). Alignment of intent is critical as identified by [Alghisi and Saccani \(2015\)](#) who emphasize the importance of the alignment of strategic orientation (servitization intent) and the internal organization within the servitization process. There is, therefore, a need for greater understanding of the role of servitization intent in the process of business model change associated with servitization.

By examining an industry that has become highly servitized, this research attempts to shed light on the role of servitization intent in the servitization process. This paper addresses the call for research to challenge paradigmatic assumptions ([Luoto, Brax and Kohtamäki, 2017](#)) of servitization research, by identifying a dissonance in servitization intent which can be a barrier to servitization, versus existing literature which, by omission, assumes some level of unified intent in the servitization process. While current research identifies the resistance of individuals to servitization, or a lack of service orientation ([Rese and Maiwald, 2013](#)), it does not address the cognizant aspect of intention as a potential enabler or barrier to servitization. Our contribution is two-fold: we define servitization intent

as representing the desire for a future state of servitization and illustrate that, due to the differences of servitization intent between different actors within the organization, dissonance can occur which creates specific barriers to servitization.

2.0 THEORETICAL BACKGROUND

2.1 Defining intentionality, servitization intent and dissonance in servitization intent

While only a limited number of studies have examined what strategic intent means (O'Shannassy, 2016), Hamel and Prahalad (1989) define strategic intent in terms of a focus on winning and growth. Mariadoss *et al.* (2014) expand the definition of strategic intent to include the strategic posture that permeates the firm impacting both investment and resource allocation decisions. Recent work defines the strategic intent construct as having three elements: a shared vision, resource focus and foresight (O'Shannassy, 2016). The role of top executives in shaping and driving strategic intent is critical, particularly in defining a vision for the future state of the organization and engaging the organization to achieve this vision (Smith, 1994). Hence, the agent associated with strategic intent can be identified as the top executives (Böhm *et al.*, 2008; Nadkarni and Herrmann, 2010). Strategic intent encompasses both envisioning and active management processes, including a desire to accomplish the vision (Ogilvy, 2010). Strategic intent has been identified as a critical aspect of success in entrepreneurial activities (Bird, 2015), internationalization (Hutzschenreuter *et al.*, 2007) and innovation (Cañibano *et al.*, 2006). Furthermore, strategic intent is a critical driver of developing a new business strategy and driving cultural change (Ice, 2007). It is posited that one aspect of strategic intent can be executive management's focus on achieving a future state for the organization encompassing some level of servitization. This desire for a future state of servitization represents servitization intent.

In relation to driving strategic change in an organization, the concept of "muddling through" identifies the intended strategy (the desired strategy) versus the realized strategy (the actual strategy) which can be described as a stream of decisions expressing an intent (Mintzberg, 1978). Here, the decision streams associated with a strategy are seen as being shaped by the external dynamic environment with executive leadership acting as the moderator between the intended and realized strategy. This muddling through process (Johnston *et al.*, 2012) has been used in servitization to describe the incrementalist approach to servitization with constant modifications and *ad hoc* decision-making during the servitization process (Kowalkowski *et al.*, 2012). Servitization intent suggests that the executive strategy pursues a desired level of servitization in the future. While muddling through could be seen as impacting the servitization intent or execution of the servitization

strategy, it suggests the executive intent is primarily reactive (thus modifying the actual strategy or decision streams) rather than an intentional desire for a future state of servitization as indicated by the concept of servitization intent (a desired strategy). While this may appear to be a subtle difference, it is an important one, as muddling through presents the executive strategy development process to be more of a reactive, evolutionary process driven (by the environment) versus an intentional strategy developed based upon the desire of the executive team to achieve a specific state in the future (servitization intent).

While the broader organization's servitization intent could be assumed to align with senior leaders' servitization intent, it may not necessarily be so; tensions and problems may result from different groups in the organization having different views and lacking shared intent to act to effect the change associated with the servitization process (Blackler and Reagon, 2009). As an organization is made up of many individuals (Coase, 1934), each of whom may have their own intent (Searle, 1983) it is difficult to ascertain the servitization intent of the organization. Within manufacturing industries, employee sense making regarding the concept of servitization and how they react to servitization may be bounded by the constraints of a product-centric manufacturing heritage, despite the stated strategic direction (sense giving from top executives) being focused on the end state of servitization (Eskelinen, 2017). In the process of servitization, internal managerial tensions (Burton *et al.*, 2016) may result in a firm's stated servitization intent being at odds with the intent of many individuals within the organization who want to maintain the product-based business model. Alignment between the strategy and organization change is essential in the shift to a services led business model (Kindström and Kowalkowski, 2015). Coherence of intentionality among the individuals in an organization has been identified as a key to success for entrepreneurial organizations, without which there is "inefficient communication, inconsistent decisions, and counterproductive conflict, thereby contributing to the vulnerability of the venture" (Bird, 2015, p. 450). Thus, a lack of cohesive intent to servitize can be expected to create dissonance in servitization intent.

2.2 Dissonance in servitization intent as a barrier to servitization

Servitization is difficult, with organizations being tested at strategic, operational and social levels (Martinez *et al.*, 2010; Lütjen *et al.*, 2017). This is further complicated because there no single correct transformation path for servitization (Kowalkowski *et al.*, 2012; Witell and Löfgren, 2013; Burton *et al.*, 2017). For example, firms in a weak financial position may need to leverage supplier relationships in servitization efforts, while firms in a strong financial position may need to leverage strong customer linkages in their servitization

effort (Böhm, Eggert and Thiesbrummel, 2017). The organizational changes needed to transition through servitization are widely acknowledged (Oliva and Kallenberg, 2003; Baines *et al.*, 2009; Alghisi and Saccani, 2015), although consensus around how organizational change can be achieved successfully remains elusive (Burnes, 2005).

To affect second-order changes during the servitization, it is necessary to change behavioral processes for both managers and employees in terms of both service awareness and understanding of the individuals role in the service process (Gebauer *et al.*, 2005a). The firms' existing dominant logic (Bettis and Prahalad, 2015), the organizational structure for the services business (Gebauer *et al.*, 2006) and the ability to shift from producing and delivery products to effectively producing and delivering services (Neely, 2009) represent organizational barriers to servitization. Within manufacturing industries, employee sense making regarding the concept of servitization and how they react to servitization may be bounded by the constraints of a product-centric manufacturing heritage despite the stated strategic direction (sense giving from top executives) being focused on the end state of servitization (Eskelinen, 2017).

Using organizational studies and agency as a backdrop, Blackler and Reagon (2009) highlight the problems that arise in an organization when managers or professionals do not share similar views and, thus, the collective intentionality becomes dysfunctional, with many views and implementations taking place. Hence, employees' notions of their managerial/group intentionality may be at odds with the strategic intent of senior managers (Burton *et al.*, 2016). Using the terminology identified by Mantere (Mantere and Sillince, 2007), this represents a gap between the strategic intent as defined by top management (servitization intent) and the organizational strategic intent (to focus on products) which represents the collective intent of all members of the organization, in other words, a dissonance in the servitization intent.

Another barrier to servitization (Huikkola *et al.*, 2016) which can also be a contribution to dissonance in servitization intent is organizational rigidity. Multiple approaches have been identified for addressing this rigidity, including learning activities (Walter *et al.*, 2016), expanding the managerial awareness of the external environment and cognition of the need for organizational learning to align with the external environment (Tripsas and Gavetti, 2000), and, a continuous level of transformation activity as an enabler of overcoming organization inertia (Teece, 2017). Creating spin-off companies, divisions or hybrid structures has been identified as a way to circumvent organizational rigidity both in technological disruption research by Clayton Christensen (Tongur and Engwall, 2014) and

servitization research (Davies *et al.*, 2006). While recognizing this as an approach for dealing with organizational rigidity, this does not diminish the need for understanding dissonance in servitization intent. The existing work regarding organization rigidities, particularly in industries with a high degree of organizational rigidity or structural rigidity (Helms, 2016), reinforces the necessity of understanding the role these rigidities play in significant organizational change such as servitization. Additionally, organizations that seek to pursue a more incremental or evolutionary approach to servitization (Raddats and Kowalkowski, 2014; Burton *et al.*, 2017) without creating a separate services unit or business unit may still be subject to this dissonance in servitization intent.

Different communication behaviors and differences in ways of working have also been identified as a creator of behavioral tension in value co-creation (Tøth *et al.*, 2017), both of which also may be manifestations of a lack of cohesive servitization intent.

Blackler and Reagon (2009) state that such tensions and contradictions need to be embraced and addressed in new ways to find a “successful” outcome. Given these common organizational barriers and the cognitive bias represented by a manufacturing business paradigm (Gebauer, 2009), the desire to move from a product centric business model to a new business model based upon services requires this gap in servitization intent to be bridged.

2.3 Research gap

The lack of research to identify or explore the dissonance in servitization intent (between the senior leadership team and staff at the organization) represents a gap in the literature. The aim of this research is to explore the impact of dissonance in servitization intent on the business transformation which takes place as part of the servitization process. If the dissonance in servitization intent is important, this could have significant ramifications for understanding the change associated with servitization.

Hence, the objective of this research is to determine what the role of servitization intent is during servitization. To investigate this, the following research questions have been developed:

RQ1. Are there barriers relating to converting servitization intent into servitization outcome?

If so:

RQ2. What are they?

RQ3. What are the mechanisms for overcoming these barriers?

3.0 RESEARCH METHOD

3.1 Research approach

This paper focuses on the office products (OPs) Industry (manufacturers of copiers, printers, multifunction devices) to understand the role that servitization intent plays during the servitization process and subsequent business model transformation. It uses a sample of companies representing the entire industry to explore whether there is a difference in the approach to business model transformation between firms in the imaging industry, given their different levels of servitization. The office products industry is appropriate for this study given its history in leading servitization ([Visintin, 2014](#)), and the level of servitization ([Photizo, 2013](#)) (in excess of 20 per cent as shown in [Table 12](#)) observed. This level of servitization is much higher than in most industries ([Santamaría et al., 2012](#)).

Table 12 Office products servitization

Servitization level	2008	2009	2010	2011	2012
Servitization (%)	10	14	18	20	23

The industry has undergone a significant shift to a pay-for-use model with manufacturers and resellers providing fleets of devices based on a cost per page financial model with, in many cases, these providers retaining ownership of the assets, offering advanced services focused workflow or business processes, and in some cases, provided on-site staffing to support customer operational needs in programs typically labeled as managed print service (MPS) programs ([Rapaccini and Visintin, 2014](#)).

Servitization can represent a very complex organizational transformation ([Buschmeyer et al., 2016](#)) making this study of the highly servitized OP Industry relevant to understanding both servitization intent and the servitization process. Each of the companies in the study are public companies with revenues ranging in size from \$2B to \$50B (US\$). Both secondary data and elite interviews with top firm executives were analyzed to understand the servitization dynamics for these firms. The executives who were interviewed were located in Japan, Europe and North America. These firms represent over 65 per cent of the total industry revenues ([Lecompte, 2013](#)) and are shown in [Table 13](#).

Table 13 Respondents and respondent firm profiles

Company	Level	Scope	Role	2013 North america market share (products) (%)	2013 Global market share (direct MPS) (%)
Company A	EVP	Global	Head of Strategy, Planning and AP Region	21	27
Company B	Director	Europe	Head of Marketing (Europe)	14	19
	GM	Global	Head of MPS globally		
Company C	Director	Global	Head of MPS Operations Globall	22	16
	Executive VP/GM	Global	Head of MPS globally		
Company D	Vice President	Regional - Europe	Sales VP	1	2
	Product Manager	Global	MFP Products		
	Director	Regional - USA	Channels Director		
	Director	Global	Head of MPS globally		
Company E	Director	Europe	Head of Marketing (Europe)	3	7
	Director	Global	MPS Operations		
Company F	Vice President	Regional - USA	Services/Sales VP	6	4
	Executive VP/GM	Global	Board Member, Head of Services Globally		
Total				67	75

3.2 Secondary data

Secondary data were used to triangulate the elite interviews and specifically to identify external statements by the company regarding their servitization intent. The sources used are summarized in [Table 14](#).

Table 14 Secondary sources

Source	Company A	Company B	Company C	Company D	Company E	Company F
Press Briefing/Release	X	X	X	X	X	X
Financial Analyst Briefing	X		X		X	
Company Presentation				X		
Quarterly/Annual Report	X				X	X
Corporate Report	X	X	X		X	X
Executive Speech/Blog/Interview	X	X	X			X
Industry Market Data Report	X	X	X	X	X	X
Elite Interviews	X	X	X	X	X	X

Each of the firms had expressed a commitment to servitization as evidenced by the examples shown [Table 15](#) in which servitization intent through public statements, releases or presentations is demonstrated by companies included in this study. [Gebauer \(2009\)](#) has suggested that secondary data such as this is a rich source for understanding managerial cognition related to service orientation.

Table 15 Examples of statements regarding servitization intent

Company	Item	Year	Content
Company A	Briefing	2009	Acquires global service provider – growing business by 33% (revenues)
	Financial Briefing	2011	Number 1 priority to accelerate services business growth
	Executive Blog	2012	Commitment to leading in MPS market and offerings
	Quarterly Results Briefing	2013	“Shifted to a services-led growth portfolio”
Company B	Press Release	2011	Announces \$300m investment in services/MPS infrastructure
	Press Release	2011	Releases new MPS offering, claims “progress in the evolution of the <u>services-led business model</u> Ricoh unveiled in January 2011”
	European CEO Speech	2012	Reaffirms commitment to service-led approach, “Our new services-led architecture is the gateway to the cloud and the world of managed document services.”
	Press Release	2013	Named 2nd globally in MPS. Expressed continued commitment to “aggressively accelerate our shift to a services business model”
	Press Release	2014	Acquisition of Managed Services provider (Mindspring) covering North America
	Press Release	2014	Announces separate MPSs division
Company C	Financial Analyst Briefing	2009	CEO statements - focus on MPS, key growth opportunity
	Executive Interview with Press	2010	VP statement at conference “stressed the company’s commitment to the print services market”
	Press Briefing	2014	Briefing: HP’s Focus on MPSs
	Press Briefing	2009	USA Division Announces New MPS Program/Offering
Company D	Press Release	2010	Ok! USA Hires Executive to head MPS sales, affirms commitment to MPS
	Company Briefing	2012	Announces new MPS offerings - reaffirms commitment to MPS market
	Channel Partner Briefing	2013	Announces new product line developed to support MPS
	Quarterly Earnings	2010	(CEO statement) Company focused on growing services (MPS) and software
Company E	Financial Analyst Briefing	2010	Announces acquisitions of Perceptive Software as part of solutions/MPS strategy
	10K Report	2012	Lexmark identifies MPS as key focus for future growth
	Financial Release	2013	Additional software acquisitions, maintaining leadership in MPS
	Press Release	2010	Announces new global MPS program
Company F	Annual Report	2012	CEO identified services as key growth driver in business segment
	News Interview	2013	Buys charter house, a sign of services as a key strategy
	Article CEO Europe	2013	By optimizing printing, MPS forms the basic foundation for Konica Minolta

3.3 Elite interviews

To understand the specific dynamics associated with servitization within the OP Industry and extend the secondary data described above, elite interviews (i.e. interviews with senior executives) were conducted. In doing so, the research answers calls from Gebauer (2009) for interview-based research on the subject of management cognition (attention) and servitization. Elites are defined as those individuals at the top of a social, economic or organization stratification system (Moyser, 2006; Welch *et al.*, 2002), with these interviewees being among the top executives within their organizations. Elite interviews were selected for their ability to provide rich insight into motivations and behaviors associated with management decision-making and deep insights into respondents’ cognitive frameworks (Welch *et al.*, 2002; Hochschild, 2015). Also the nature of the research which

is looking at senior level servitization intent with respect to the servitization process meant that insight from elites was critical to achieving the purpose, thus confirming the suitability of this approach (Aberbach and Rockman, 2002).

When interviewing elites, the perceived status relationship or differential between the interviewer and the interviewee can be an issue, making it important for the interviewer to establish their position and credibility (Mikecz, 2012). Due to the lead researcher's experience in the industry, it was possible to gain access to senior executives directly involved with these firms' servitization efforts and to have immediate credibility and trust which is critical in interviewing elites (Moyser, 2006). This inside industry role provided an advantage in the interviewing process by providing a knowledge base for assessing the validity of the respondents answers in relation to their role in the change process (Berry, 2002; Mullings, 1999). However, it is difficult, if not impossible, to avoid some level of bias when conducting elite interviews when the interviewer has had prior exposure to the interviewees (Welch *et al.*, 2002). Self-representation is critical, in elite interviewing, to establishing a power-balanced interview. In this instance, the interviewer clearly identified their role in this situation as a researcher, in essence establishing a balanced role as an impartial industry observer (Welch *et al.*, 2002; Mullings 1999). It was recognized that getting the right balance to minimize such bias was of critical importance (Berry, 2002).

Elite interviews do not require large samples with adequate sample sizes beginning at 12 interviews (Adler and Adler, 2012). The elite interviews were conducted with 13 executives from the six OP industry manufacturers. Executive identities are disguised to support anonymity.

The interviews took place over the course of one year. Interviews were conducted both in-person (when possible) and by phone to provide the most convenient and comfortable interview environment for the respondent (Kincaid and Bright, 1957; Aberbach and Rockman, 2002). A semi-structured method was used with ten open-ended questions which acted as a guide (see appendix), but with the interviewer providing the personnel being interviewed with the opportunity to expand upon topics as they deemed appropriate (Aberbach and Rockman, 2002). This type of flexible interviewing with open-ended questions is highly desirable when interviewing elites, as they often resist close-ended questions limiting their responses (Aberbach and Rockman, 2002). The interviews lasted 60 to 90 min and were recorded. They were subsequently transcribed and the interviewees were given a copy of the transcribed interviews and invited to sense check for accuracy, provide feedback and clarification; in several cases answers to follow-up questions and clarifications

of responses were captured from the respondents (Mikecz, 2012). This method is also recommended to ensure quality when dealing with corporate elites (Welch *et al.*, 2002).

Interviewees were selected using purposive convenience sampling based upon the availability of executives; who were associated with the services business in terms of its formation or development for each company. The goal was to interview the highest level executive possible, as these executives would have the most comprehensive view of the organizations' operations and servitization process (Kincaid and Bright, 1957). While two organizations limited interviews to a single, senior individual, multiple executives were interviewed at the other four to gain a comprehensive set of viewpoints, thus facilitating triangulation of the data (Creswell and Miller, 2000). The interviewees were primarily senior executives with a significant length of tenure in the OP Industry.

3.3 Interview analysis

Coding is a critical element in analyzing data from elite interviews. Coding enables researchers "to communicate and connect with the data to facilitate the comprehension of the emerging phenomena and to generate theory grounded in the data" (Basit, 2003, p. 152). One challenge in the coding process is that the respondent's statements are addressing complex issues, which are context sensitive. NVivo was used as a tool to assist in coding process to achieve a greater degree of flexibility in analyzing and viewing the data to better understand the relationships between categories (Bringer, 2006).

The coding was undertaken using an abductive approach (Dubois and Gadde, 2002). The coding process began with line by line open coding, to ensure maximum saturation of codes and to avoid missing any important themes (Holton, 2007). This initially resulted in 242 individual codes. Subsequently, axial coding was conducted, where codes associated with the same concept were combined into a single code. For example, "less print" and "less need for print" were combined into the code "reducing print." This resulted in reducing the number of codes to 121. This was an iterative process, with codes being constantly compared to subsequent interview transcripts and codes. Codes were then compiled into categories which represented "themes" associated with the individual codes.

Subsequently selective coding was used to analyze the codes and focus the analysis on the codes related to the business model transformation (associated with servitization). Within business the term "business model" is poorly defined (Shafer *et al.*, 2005). In the context of these interviews, the term business model transformation or business model shift was used by the respondents to describe the firms' movement from a focus on manufacturing

products to a focus on services. Respondents were not familiar with the term servitization, although their description of the business model shift is consistent with the term “servitization” used in academia as shown by the following quotes:

You know, engaging a razor/razor blade model and turning it into a click charge where they only pay you every time they print something or you know scan something. That is a whole fundamental shift in how you measure the business [...] (Organization C, Executive VP/GM)

Everything is different and your productivity is totally different in that business. Visibility is totally different. They are two different business models and the competition is totally different. (Organization C, VP)

We regard servitization as an overarching concept that includes but goes beyond service infusion, where servitization is defined as the transformational process of shifting from a product-centric business model and logic to a service-centric approach. (Kowalkowski et al., 2017, p. 7).

Table 16 identifies the eight major categories of codes which are associated with business transformation and servitization and the companies that made references which were included in these codes.

Table 16 Coding by company

Code	Co A	Co B	Co C	Co D	Co E	Co F
1. Barriers to business model change	X	X	X	X		X
2. Blending business models			X			
3. Business model differences	X		X			X
4. Drivers of business model change	X	X	X	X	X	X
5. Services business model	X	X	X	X		X
6. Sustainability of business model	X		X			X
7. Traditional business model		X	X	X	X	X
8. Types of transitions	X		X		X	X

Each of the categorical codes (or variables) comprises multiple individual codes which fit thematically within the categorical code. For example, the categorical code: “barriers to business model change” included individual codes such as “conflicting directions” and “lack of leadership”.

Hirschman’s (1986) and Creswell and Miller’s (2000) criteria for assessing validity of qualitative data were used to guide the coding process. Reflexivity of the research team and the abductive approach to the coding, analysis and presentation of the data were central to presentation of the findings (Creswell and Miller, 2000; Dubois and Gadde, 2002).

4.0 FINDINGS

In analyzing the coding categories, an over-riding theme emerged of a desire for servitization, or servitization intent, among the respondents and the recognition of both the importance and challenge of pursuing servitization over the long term. At the same time, key managerial challenges within the organization were identified as barriers to achieving this servitization intent. A number of mechanisms for effecting change were also described. These findings are discussed in further detail in the sections below.

4.1 Dissonance in servitization intent

In the interviews, three main managerial challenges (barriers to change) were described. These were: lack of servitization intent, overcoming the organizational intent (which can be described as a manufacturing mindset of organizational employees) and the constraints resulting from a limited breadth of managerial experience. Table 17 indicates which categorical codes included references to each of these challenges:

Table 17 Managerial challenges by categorical code

Code	Lack of servitization intent	Overcoming manufacturing intent	Managerial experience
1. Barriers to business model change	X	X	
2. Blending business models		X	X
3. Business model differences	X	X	
4. Drivers of business model change	X		
5. Services business model		X	X
6. Sustainability of business model	X		X
7. Traditional business model		X	X
8. Types of transitions		X	X

The complexity of transformation challenges associated with servitization (Helms, 2016) is evidenced in the multiplicity of challenges associated with each individual code. With the exception of business model differences, each code had at least two categories of challenges associated with it. The following section will explore each of the managerial challenges in more depth.

4.1.1 Lack of servitization intent

The respondents identified servitization intent as critical to the servitization effort as in the following quote:

*If you really want to do it, you are committed to it even if you want to do a phase approach.
(Company D Channels Director)*

While the importance of servitization intent was identified by the respondents, the lack of servitization intent was also identified as a critical barrier in the codes for barriers to business model change, business model differences, drivers of business model change and the sustainability of the business model. The interviews identified several specific barriers to servitization which demonstrate a lack of servitization intent, including a lack of long-term commitment, and a lack of leadership commitment. A near term temporal focus (coded as “change takes too long” and “failure to give time”) is one aspect of a lack of servitization intent, as it indicates a lack of long-term resource focus and foresight (core to the strategic intent construct) as demonstrated by the following quote:

There is even a good business model opportunity internally but the company does not give it long enough to mature [...] we are in this yearly cycle, quarterly pattern, and all of a sudden if there are other business impacts, maybe some other parts of the business are struggling [and] you

cannot stick with it, and you go into the next year planning cycle and now maybe we will not fund in as much, maybe we will do something different. (Organization C Executive VP/GM)

Other codes indicating a lack of servitization intent include lack of leadership and management not being convinced, both of which would be inconsistent with the shared vision and strategic posture associated with strategic intent. This is most clearly demonstrated in the following quote which identifies inconsistent behavior by the CEO in relation to the servitization message:

“When the big conference [of] three days, then it’s all about services [..] blah, blah, blah, blah, blah”. And then the CEO gets up at the end of the conference and says, “Look, thanks so much for coming. And I can already see the future. But don’t forget we got month end coming..” “.. and you got to get the boxes out the door.” And so everything that they had done, was completely dead in one fell swoop. In one statement from the CEO it was absolutely flattened, because it said, “Look, we are not serious about it.” (Organization B Marketing Director – Europe)

Interestingly, this quote indicates a situation where the organization (or parts of it) may have a stronger servitization intent than the top executive, indicating that servitization intent may not always be a “top down” phenomena, or that all of the top management team may not be in alignment with regards to their level of servitization intent.

4.1.2 Organizational intent based on the current manufacturing business model

Overcoming the strong manufacturing culture associated with the existing business model was explicitly identified as being a barrier to servitization intent in the category codes including barriers to business model change, blending business models, business model differences, services business model, types of transitions and the traditional business model. Again, organizational intent can be viewed as the coherence of intent by the collective organization (Mantere and Sillince, 2007), which may or may not be consistent with servitization intent. An existing manufacturing business model results in a corresponding manufacturing culture that then impacts the organizational intent with the result that the latter can contradict the servitization intent (to develop a servitized business model).

When asked about the challenges associated with the transition to services, the Marketing Director in Organization B explicitly identified the traditional product business model as a barrier. Concerns were also expressed about the potential disruption to the existing business model if the firm tried to undertake a rapid transition to a services business model by the VP of Sales, Company F:

There are a lot of hesitations within the organization where we have been enjoying very profitable business model to change [..] Sometimes [people] do not want to change their behavior or way of doing their business and also systems, so we are trying to change their business performance management way and also our system revenue recognition, cost recognition system and consequently other systems. That sort of change we need but it is not easy, so that is the kind of [..] an organizational barrier. (Executive Director, Organization B)

This resistance to change appeared widespread, despite several executives noting the need for a radical departure from the traditional business model due to changes in the environment:

Where I came in is, you can do something radical which is a huge departure from your core business right? (Organization F, Senior VP)

It is amazing how they can find ways to kind of keep what they are doing going and then all of a sudden it becomes so compelling and so devastating that they cannot react to it I think there has to be this compelling business impact externally, but the other half of the equation is it has to have a business model impact internally as well (Organization C, Executive VP/ GM)

Such resistance to change can be seen to impede servitization to such an extent that the move to a new business model is deemed to have failed. An executive from one firm, which is currently going through the process of shifting its focus back to products (“reverse servitization”; Finne *et al.*, 2013), actually cited the firm’s current business model, an inability to think beyond this business model and their lack of success in changing the business model, as reasons for the firm’s failure to servitize and its shift back to products:

We haven’t really been successful, to be honest, and within the company the priority for us is to do the proper MPS [Managed Print Service] again, we have to have the proper resources to do it, but we haven’t really been successful as a result [of our prior efforts] and looking at [this] result top management is hesitant, well not convinced, to put more resources into it unless we show some success. (GM of Marketing, Organization D)

4.1.3 Impact of managerial experience

An interesting dynamic that was revealed was the influence of the executives’ prior experiences and how it framed servitization intent. It was identified within coding for blending business models, services business model, sustainability of the business model, traditional business model and types of transitions. Each of the executives used at least one reference from a prior position to identify how they frame key issues such as risk, or whether there should be a separate business unit for services. An example of the degree to which executives’ prior experiences shaped their thinking on servitization is provided by one executive from outside the industry, who had witnessed a significant shift in the value creation and value chain and now uses this as one of their conceptual frameworks for how servitization will evolve in the OP Industry:

At [Major Computer Company], I ran the consumer division, which started off as an interesting PC business but then all the value moved out of the PC business and the PC business declined [] I have come to believe, is just a constant race because value is constantly moving... whether that, is hardware computing or the IT infrastructure or medical devices or air planes and now cars, everything, is kind of moving away from just hardware into software and services (Organization A, Executive VP)

Three of the executives had spent a significant portion of their careers in technology firms not associated with the OP Industry prior to joining their current OP Industry employer,

with each of these executives having significant experience in service centric businesses. Executives with significant OP industry tenure appeared to be much more focused on the barriers to change, contrasting with executives from outside the industry whose focus was on actively changing the business model to realize the servitization intent (Table 18). The table identifies the number of codes (on average) associated with each respondent based upon whether they identified as their career being primarily “inside” or “outside” the imaging industry (based on tenure).

Table 18 Industry experience

	Significant portion of career inside or outside the OP Industry			
	Outside		Inside	
	Codes	Avg/Resp.	Codes	Avg/Resp.
Barriers to servitization	14	4.7	146	14.6
Resistance to change	1	0.3	24	2.4
Developing credibility and proving model	6	2.0	8	0.8
Separate business unit	17	5.7	25	2.5
Leadership and leader	24	8.0	68	6.8
Long-term horizon	6	2.0	9	0.9
Respondents	3		10	

The executive’s tenure in the OP industry may have an impact upon their ability to lead change with longer tenured executives struggling to envision and lead change beyond the existing manufacturing centric business model. The focus by executives from within the industries’ on barriers to change versus executives from outside the industry having a much clearer view of the potential to change may reflect the cognitive biases based on tenure within the industry (Hambrick *et al.*, 1993). This tie between the CEO’s commitment to the status quo and their tenure in the industry may be a result of industries having a level of group paradigms and common thinking, which results in the creation of a stable paradigm for thinking about the industry (Hambrick *et al.*, 1993). As a result, executives within the industry appear to have cognitive bias meaning that they can only accept limited or gradual change due to industry barriers to servitization, whereas executives from outside the industry appear to be free from this thinking. A contributing factor may also be the influence of past success in servitization for executives from outside the industry.

4.2 Overcoming the dissonance in servitization intent

This research identified a number of structural approaches to servitization which are consistent with existing research including developing a separate business unit (Kucza and Gebauer, 2011), developing the services capabilities and skills of staff (Galbraith, 2002; Erasmus and Weeks, 2012; Buschmeyer *et al.*, 2016), changing the sales model (Ulaga and Loveland, 2014), leveraging customer relationships (Martinez *et al.*, 2010), leveraging business model adjacencies (Araujo and Spring, 2016) and leveraging a phased approach to change (Davidson, 1999; Savic *et al.*, 2016). However, while these approaches may impact

the shared intent of the organization (the organizational strategic intent), they do not explicitly address the dissonance in servitization intent between senior executives and the rest of the organization. One executive described the drag of organizational intent as gravity:

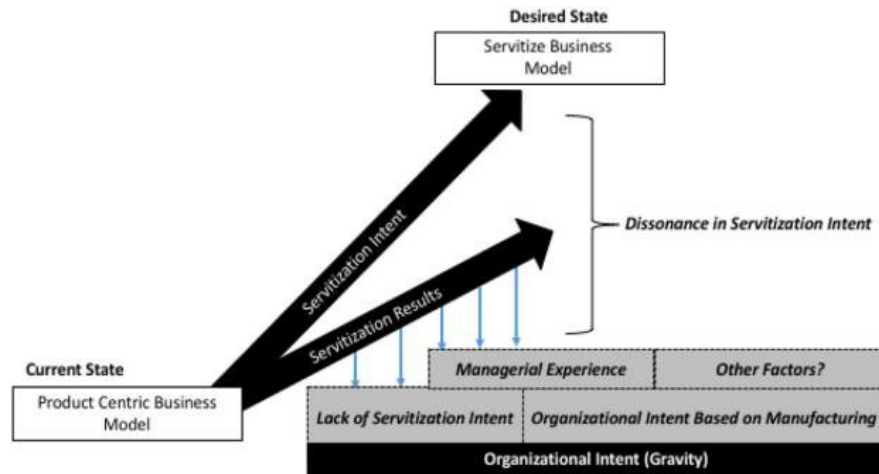
Yes, well, sometimes I use the word 'gravity', because if we say culture, many people can say that they understand the difference in culture and I'm behaving in the right way. But I call it gravity because people don't see it or feel it, and they are comfortable with it, but that is how they make decisions every day. And that gravity, and specifically the technology company's gravity is centered around technology and headquarters rather than around the market.
Organization B, Corporate Director

The executive is careful to draw a distinction between gravity and culture, as culture represents a mode of behavior, whereas gravity represents a fundamental framework for decision-making. This is consistent research into strategic change that has identified an organizations past decisions as a limiting factor making strategic choices and thus in realizing strategic change (Kelly and Amburgey, 1991). A specific case in the imaging industry is the role inertia (another description for gravity) played in limiting Polaroid's ability to make strategic change (Tripsas and Gavetti, 2000). This research posits that gravity is another term for the organizational inertia associated with the organizational intent to be a manufacturer. To fulfil the desire to achieve a higher level of servitization (servitization intent), the organization must break free from the gravity of the organizational intent to be manufacturing-centric (inertia).

To break out of the manufacturing centric gravity, the respondents articulated the need for achieving a cognitive recognition that there is a significant external change occurring in the market (one respondent referred to this as movement of tectonic plates) creating a clear and compelling business impact, in conjunction with an internal business model impact. Within the OP industry, this shift was identified by respondents as being a fundamental shift in the financial structure of the industry due to declining page volumes (a major driver of profitability), consolidation and customers desire to outsource as evidenced by the growth of MPS (Stewart, 2013).

Figure 4 provides a conceptualization of the dynamics associated with servitization intent and identifies how managerial experience, lack of servitization intent and organizational intent based on manufacturing can create a "gravity" that deflects the trajectory of servitization and creates a dissonance in servitization intent.

Figure 4 Dissonance in servitization intent



5.0 DISCUSSION

This research identifies a need to expand the understanding of servitization intent to minimize dissonance in intent and create greater alignment in servitization intent throughout the organization. This may require going beyond traditional approaches to cultural or management alignment (Erasmus and Weeks, 2012) to identify ways to shift the organizational intent (or gravity) to align with servitization intent. Furthermore, to effect change it may be necessary to recruit executives from outside the industry with a broader vision for the potential of servitized business models and without the myopic view-points of executives with long term industry experience.

Path dependency may be one structural element associated with the dissonance in servitization intent. Several respondents specifically identified the firms' reliance upon the historical revenue generation model (maximizing sales of printers to grow the installed base and drive sales of high margin supply items) and the associated decision-making paths as a limiting factor to servitization intent. While path dependency can be identified as a contributor to the organizational intent for a manufacturing business model and resistance to servitization intent, it could also be method to develop servitization intent if the organization is able to implement cultural change fostering servitization intent (Lienert, 2015). Lienert (2015) proposes a model for driving culture change using a path-agency-culture framework. However, the ability to drive this kind of strategic change of the organization's culture may be mitigated by the firm's risk tolerance profile and the resulting impact on resource allocation decisions (Mariadoss *et al.*, 2014). This is an area that holds potential for further study which is beyond the scope of this research study.

By examining the disconnect between executives' servitization intent and the organizational intent, this research addresses the need for a better understanding of the role which employees have in the servitization process (Luoto *et al.*, 2017) as reflected by the organizational intent. Our findings suggest that the more radically transformative change is, the more likely the organization will resist the change, in line with Pardo del Val and Martínez Fuentes (2003), while conversely, the most successful firms use transformative structural change (Miller and Friesen, 2015) which by its nature is radical and represents significant change for the individual and organization as a whole (Callan, 1993). Organizational change is heavily influenced by two factors: the organization's environment and its willingness to change (Dunphy and Stace, 1988). The research posits that this organizational willingness to change is a reflection of the servitization intent. This creates a paradox in that while success is linked to transformative change, firms may naturally resist transformative change if it directly contradicts historic product focused activities and/or experience of senior leaders.

Three managerial tensions were evident from the findings, relating to consistency in servitization intent, moving the shared mindset (organizational strategic intent) away from the traditional manufacturing business model, and, overcoming executive myopia derived from industry norms. These tensions share resonance with those previously identified by Burton *et al.* (2016) but advance understanding by clarifying the impact of the gap between servitization intent and the organizational intent.

Tensions relating to servitization intent stemmed from tactical responses to other business problems and not being able to keep a consistent vision moving forward. It could be suggested that the dominant logic of the firm (Bettis and Prahalad, 2015) was acting as constraint in this situation. Thus, both the scope of change (SBU or organization) and the servitization intent to change the business model may both be important factors in achieving significant levels of servitization. The combination of servitization intent and desire to accomplish change at an SBU level may play a significant factor in the service paradox (Gebauer *et al.*, 2005b) which says firms may actually see detrimental results from attempts to servitize (if they do not reach critical mass) (Fang *et al.*, 2008).

Tensions relating to creating a shared mindset derive from lack of shared views and vision (Blackler and Reagon, 2009), resistance to change (Mathews and Linski, 2016) and, a desire to retain the status quo (Silver and Mitchell, 1990). A contributory factor to this may be that the majority of the firms identified the relative success of the existing business model as an active barrier to the development of a new services based business model. While the

OP Industry is under significant business pressure, it is still very profitable having recurring revenue streams and margins in excess of 60 per cent (Lecompte, 2013).

A reluctance to add services can be linked with organizational inertia, as one of the key barriers to successful business process reengineering is organizational and middle management inertia and resistance to change (Terziovski *et al.*, 2003). This organizational resistance to change has been identified in both the strategic formulation and implementation stages of organizational transformation (Pardo del Val and Martínez Fuentes, 2003). This apparent resistance to revolutionary change could ultimately result in organizations not reaching servitization critical mass without a high degree of alignment of organizational strategic intent with strategic intent. Alignment of business model elements in the shift to a service centric model is important (Kindström and Kowalkowski, 2015), although the alignment of servitization intent and organizational intent has not previously been an area of focus for academic research.

The final tension we observed appears to relate to the constraints that industry norms may unwittingly impose on executive decision-making and vision. In this case, executives within the industry appear to have a stronger focus on either not changing the existing manufacturing focused business model or taking a less disruptive (incrementalist or evolutionary) approach to changing to a service-centric business model. This appears to be consistent with research by Hambrick *et al.* (1993) which has shown that executive tenure within an industry can lead to a degree of unwillingness to change and think outside of existing industry paradigms. It seems that the longer an executive works in an industry the more social norms and group-think drive them to revert to the status quo. The role of outside agents in provoking radical change has been widely discussed (e.g. Ginsberg and Abrahamson, 1991).

A number of drivers of transformation were also identified. These tended to be embedded in phased approaches that permitted investment in training and resources, thus facilitating development of new capabilities (Raddats *et al.*, 2017), using customer needs to provoke change (du Gay and Salaman, 1992) and facilitating value co-creation (Cova *et al.*, 2000). These processes then allow time for servitization intent alignment to develop (Alghisi and Saccani, 2015). These phased approaches are widely reported in servitization research (Gebauer *et al.*, 2006, Baines *et al.*, 2009). They could also be indicative of firms needing to retain their product focus alongside their newly developed services and not “throwing the baby out with the bath water” (Burton *et al.*, 2017).

Overcoming the barriers created by dissonance in servitization intent may require managers to actively influence the evolutionary path of the firm through an intentional focus on experiential learning (Hutzschenreuter, Pedersen, and Volberda, 2007). Furthermore, understanding the cognitive frameworks and paradigms held by the top executives is important to avoid being limited by deep structures such as existing industry paradigms (Gersick 1991) and by inter-organizational cognitions (Aspara, Lamberg, and Laukia, 2013) and may require a change in top executives to drive radical change (Hambrick et al., 1993). Selecting the right organizational structure relative to the service offering and strategy has been shown to impact competitive advantage in servitization (Bustinza, Bigdeli, Baines and Elliot, 2015) and has also been identified as a factor in servitization success (Gebauer, Saul, Haldimann, and Gustafsson, 2005) and thus should be evaluated as a strategy for overcoming organizational resistance to servitization.

6.0 MANAGEMENT IMPLICATIONS

Given the importance of organizational change to servitization (Vendrell-Herrero *et al.*, 2014; Barnett *et al.*, 2013; Ahamed *et al.*, 2013), managers have to plan how they will facilitate this change process. Current research has addressed the requirements for strategic change from multiple perspectives including the potential for inertia based on existing organization archetypes (Greenwood and Hinings, 2017), the role of the discursive process on strategic change (Jaynes, 2015), behavioral processes acting as facilitators or inhibitors to servitization (Gebauer *et al.*, 2005a), the role of organizational dynamism in adaptive business model innovation (Ricciardi *et al.*, 2016) and transformational leadership as a requirement for business model transformation (Savic *et al.*, 2016). While the impact of alignment between strategic intent and the organizations orientation to this strategic intent has been identified as a predictive factor for organization performance (O'Shannassy, 2016), research is lacking on the alignment of servitization intent and the organizational intent.

This research indicates a need to actively plan for, and manage, servitization intention at both the executive and operational level as part of the servitization process, and specifically to address the need for alignment of strategic intent throughout the organization. This has implications for the strategic planning process, resource commitments and even the selection of executives to lead the transformation efforts. The research indicates that executives with a long history inside the industry may have a greater reluctance to changing to a service-centric business model and instead may have a focus of maintaining the current business model as the “core model” and using services as an ancillary business model or focusing on the barriers to servitization to an extent that they are not willing to make significant changes.

Rapid transformation may require recruiting executives from outside the industry to lead the transformation, as they may be less encumbered or enamored with the industry's existing business models.

To take meaningful steps to reach a unified level of servitization intent, it is important to be able to measure servitization intent. Intention can be a difficult thing to measure, as it is a cognitive state which is specific to an individual and may not be readily observed externally with an objective measurement (Sayre, 1986). Furthermore, within business, studies which have attempted to measure intent and then predict actual action based on this intent often show a gap between intention and action such as studying the intent to buy wine versus actual purchase activity which was quite different than the intention (Barber *et al.*, 2012). This research posits an approach to measuring servitization intent which uses an objective measurement of servitization, the level of service revenue divided by total revenues (Fang *et al.*, 2008), as an objective target for the desired future state of servitization. Hence, the respondents in an organization would be asked what they believe the level of servitization for their organization should be at some future point, and then these responses could be compared across the organization to determine the desired future state of servitization (the servitization intent). This would provide a consistent way to measure the servitization intent across the organization and the level of alignment in servitization intent. Further research needs to be conducted to determine the best scale for measurement (for example nominal values or ranges) and the best wording for the question.

The changing competitive dynamics and demand trends within the OP Industry create the incentive to shift the business model to services to improve profitability and competitiveness (Kamp and Parry, 2017). Sudden shifts in the business model can be seen as disruptive (Vendrell-Herrero *et al.*, 2014; Gebauer, 2009) and may result in a reluctance to make a dramatic shift to a service business model, risk avoidance may lead to failure of servitization (Gebauer and Fleisch, 2007) and even a shift back to a product focus (Finne *et al.*, 2013). So while firms within the industry see the need to shift to services, they are reluctant to do so out of concern for disrupting the existing transactional business model, creating a change paradox for the industry. The research indicates that servitization intent, combined with achieving alignment with a shared mindset (organizational intent) are critical elements in breaking through this seeming paradox (the need to change, combined with the reluctance to change). This has implications in terms of creating awareness and agreement among stakeholders on the need to servitize, to influence all of the factors of intentionality including desire, belief, intention and awareness (Malle and Knobe, 1997). This may involve

communication transparency over the long-term risks to the organization and the industry if there is a failure to change.

This research recognizes that there are multiple potential organizational strategies for servitization ranging from incremental or evolutionary approaches (Kowalkowski *et al.*, 2015) of modifying existing organizational capabilities to radical approaches involving spinning-off a new business unit or organization with a service-centric paradigm (Barnett *et al.*, 2013). The topic of servitization intent has application across all of these approaches; however, the strategies for achieving alignment may be different based upon the servitization strategy and is an area of potential future study.

7.0 CONCLUSION

The overall objective of this research was to determine what the roles of servitization intent and organizational intent have in changing from a product-centric to a service-centric business model. Three research questions were explored: *RQ1*, *RQ2* and *RQ3*.

Three key managerial challenges that act as barriers to business model transformation in servitizing firms were identified: lack of servitization intent, overcoming the manufacturing mindset reflected in the organizational intent and the constraints resulting from breadth of managerial experience. A number of managerial strategies for overcoming these barriers were identified.

By examining the servitization intent in the servitization in the OP industry, this research responds to the call for further research to provide a context for the variability of management innovation in an institutional context (Volberda *et al.*, 2014). It provides an industry level perspective for the process of business model change associated with servitization.

Our contribution stems from elaborating the tensions that senior managers face when trying to transform business models during the servitization process and the mechanisms that can reduce these tensions and help effect servitization. Recent research has identified how tensions can develop in network relationships related to co-value creation in projects (Toth *et al.*, 2017). Tensions emanated from achieving consistency in servitization intent, creating a shared mindset and overcoming managerial myopia derived from industry norms. A softly, phased approach seemed to be most suitable for lowering tensions around the process, with more radical change needing to be invoked by industry outsiders.

By providing a focus on the need for executives to have a cognitive recognition and focus on the intent to servitize the business, this research expands upon the existing body of literature which identifies specific barriers and drivers to business model transformation in

the support of servitization ([Gebauer *et al.*, 2005a, 2005b](#); [Kindström, 2010](#)). This has a significant practical implication in terms of identifying a need for additional executive management education and dialogue regarding best practices and approaches to achieving unified servitization intent, and potentially for recruiting executives from outside the industry to lead change.

This research focuses upon a single industry and draws conclusions based upon this industry; however, the drivers and dynamics for other industries may be very different. Examination of multiple industries would provide further clarity regarding the applicability of these findings. We use a relatively small number (13) of elite interviews representing a limited number of companies (6) with a limited number of interviews per company. However, because these interviews are with top executives for these firms, and these firms represent the majority of revenues for the industry, this makes this a relatively deep and extensive study of the OP industry. In-depth case study analysis could provide further insight into the dynamics within each of the companies included in this study and provide further light on the interactions of various factors.

Inertia can be a significant factor in inhibiting change at an organization or even a network level which may require a “critical event” to drive an organization from incremental change to radical change ([Halinen *et al.*, 1999](#)). A number of the points within this research imply a need to drive significant change in the organization to shift the business model from a product-centric focus to a services-centric focus. This may require an organizational crisis to create the impetus for an organization to pursue strategic intent ([O’Shannassy, 2016](#)). Further research on the linkage of a critical event or crises to successful servitization efforts would be beneficial.

Finally, a critical aspect of achieving alignment of the servitization intent must begin with an understanding of what the “shared organizational intent” is. Further research into tools and methods for quantifying and measuring the organizational intent to be able to benchmark it against the servitization held by the executive management team would be extremely beneficial for developing recommendations for practice application.

NOTE

- 1 While there is still considerable discussion and some ambiguity regarding the definition of the term servitization ([Lightfoot *et al.*, 2013](#)), it has become the most frequently used term by industrial marketing and operations management scholars ([Brax and Visintin, 2017](#)).

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APPENDIX 1 MODERATORS QUESTIONS

The following questions were used in the moderator's guide.

1. Where is your firm at in the process of servitization. Are you servitizing? Or is your focus on products? Has your focus shifted over the past few years?
2. Can you provide a description of your firm's journey through the servitization process?
3. What is the biggest driver of your company's servitization? Why is your firm servitizing?
4. What is your biggest barrier to success? What if anything are the specific issues holding your organization back from reaching your servitization objectives?
5. Were there any key inflection points where your organization gained significant momentum in the servitization process?
6. Historically has your firm delivered products to customers directly via your own sales organization (versus channel partners), through channel partners, or through both? What impact has having a direct sales model or a channel sales model had on the evolution of your service business?
7. What impact has your company's culture had on the development of your service business? Have there been any major advantages or disadvantages in terms of the growth rate of your service business based on this culture? How would you describe your corporate culture in terms of taking risk, engaging in new business areas and making and implementing strategic decisions?
8. Does your organization have a separate business unit or subsidiary for delivering services with its own management team, its own P&L, and it is different criteria for measuring success relative to your manufacturing business? Or does your organization have one P&L, management team and successes measurement criteria for both manufacturing and services? In your opinion what has been the effect of this structure on your business?
 - a. How is this working or not working?
 - b. How do you gain buy-in from senior management for servitization, or is this driven by senior management?
9. Does your firm's headquarters location have an impact on the development of your service business? Are there unique cultural, economic or market advantages associated with your firm's headquarters location and the growth of the service business? Why is that?

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4.0 NATIONAL CULTURE AS A BARRIER TO SERVITIZATION

A Layered Model for Factors in Servitization

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Production Management

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***Layered challenges to servitization:
from cognitive to industry level***

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Abstract

Purpose – The purpose of this paper is to investigate how industry level dynamics and organizational differences create challenges to servitization for manufacturers in the Office Products industry.

Design/methodology/approach – At an industry level, a mixed methods design including quantitative grounded theory utilising secondary longitudinal survey data, industry data and elite interviews have been used to capture data from both manufacturer and customer perspectives.

Findings – While Japanese and US Office Products manufacturers offer the same services which potentially produce the same results for customers on a global basis, Japanese firms appear less successful in achieving servitization (defined by proportion of revenue from services to total revenue) compared to US firms. In studying this phenomena, the authors identified three layers of factors inhibiting and driving servitization; ‘*cognitive*’, ‘*organizational*’, and ‘*industry*’ level. For Japanese manufacturers, the influence of national culture characteristics on *cognitive* factors appears to create multi-level challenges, inhibiting servitization and contributing to the servitization paradox for these firms. It is contended that these challenges prevent the Japanese manufacturers from realizing the same level of service revenue (relative to total revenue) versus US manufacturers. The limiting *cognitive* factors identified by this study include; what is valued, tradition, belief in services, trust, risk tolerance, intentionality, perspective towards service, change tolerance, and desire to servitize.

Research limitations/implications - While this study is limited to one industry, by taking a whole industry level view, it expands servitization theory to include national culture attributes as a servitization factor. Further quantitative studies to validate and measure linkages between servitization results and the cultural and cognitive factors of servitization would enhance understanding of these factors and their impact on servitization.

Originality/value – By identifying a three-layer model for servitization challenges, this research expands existing servitization theory. Organizational culture has been identified as an important factor in servitization and by examining an entire industry holistically from dual perspectives we illuminate the multi-layered nature of servitization and how national culture can impact the different layers of factors, to differing degrees, to create servitization challenges.

Keywords – Servitization, national culture, servitization challenges, longitudinal, customer perspective

Paper type Research Paper

1. INTRODUCTION

In price competitive markets, manufacturing firms are increasingly adopting services (Vandermerwe and Rada, 1988; Lay *et al.*, 2010) in an attempt to improve competitiveness (Gebauer, Gustafsson and Witell, 2011; Smith, 2013) long term profitability and firm value (Fang, Palmatier and Steenkamp, 2008; Cusumano, Kahl and Suarez, 2014) by increasing the value delivered to end-customers (Grönroos, Ravald and Ravald, 2011; Luo *et al.*, 2012). However, the attempt to servitize is not always successful as evidenced by cases of reverse-servitization or deservitization (Finne, Brax and Holmström, 2013; Kowalkowski *et al.*, 2017) and servitization failure (Valtakoski, 2017). The volume of servitization research continues to grow rapidly, (Kamp and Parry, 2017, Baines *et al.*, 2017). Despite this growing body of servitization work, there is a lack of research on the servitization of entire industries (Valtakoski, 2017) leaving a gap in our understanding of how industry level dynamics may impact customer expectations for manufacturers offering services (Turunen and Finne, 2014). This is unfortunate given the need to understand both the provider and customer view, in order to have a complete understanding of servitization dynamics (Valtakoski, 2017). Several researchers have indicated the need for this type of research to guide industrial and government policy on servitization (Bajpai and Radjou, 1999; Lin, Luo and Zhou, 2011). Furthermore, few studies have identified national culture as a factor in servitization including the identification of national culture as a to the adoption of services in Japan (Toya *et al.*, 2016) as well as a potential inhibiting factor for new service development (Jong and Vermeulen, 2003), and as an important factor in engaging in cross-cultural service engagements (Tata and Prasad, 2015). This creates a gap, in that while national culture is seen as important to strategic issues, and servitization is a strategy (Lin, Luo and Zhou, 2011; Redding, 2014), extant servitization research largely assumes that servitization phenomena occur independently of national culture.

Our research began as a longitudinal study examining industry level dynamics related to business model change within the specific context of servitization. By using quantitative grounded theory analysis of survey data containing customer views of manufacturer's service capabilities and outcomes, the study validated servitization dynamics previously studied at the firm level as also being present at the industry level. Since the data was based upon customer views using a large global sample of customers, the study was not subject to vendors projected desired results, but rather, results as perceived by the customer. This provided a different perspective relative to extant servitization research which is

dominated by service provider perspectives, with little research on the customer's perspectives relative to servitization (Tuli, Kohli and Bharadwaj, 2007). The unique contribution of this industry level analysis was the identification of two different levels of servitization for firms in the industry which aligned with the national origin of firms in the industry. This difference would not have been evident based upon analysis of individual companies, subset of companies in the industry, nor a cross-industry survey and represents our first research contribution.

In order to further understand this difference in levels of servitization, the study continued using a grounded theory method of in-depth interviews with executives from manufacturers in the industry. The analysis of this qualitative interview data identified that the difference between the two groups is related to the effect of culture at national, industry and firm levels upon an organization's servitization efforts. This research proposes a three-layered model for servitization factors based on industry (macro), organization (meso), and group/individual (micro-meso) servitization factors. This nuanced and holistic view of servitization would not have been evident by studying servitization at either the industry or firm level in isolation and represents our second research contribution.

Furthermore, the grounded theory method which guided the entire research process allowed for the combination of quantitative data using quantitative grounded theory analysis with qualitative interview data from in-depth semi structured interviews, to provide dual lenses into the industry and the firm level of servitization. These dual lenses were critical in analysing the multiple layers of servitization including industry, organizational, and cognitive. Thus, unlike quantitative broad cross-industry studies (Fang, Palmatier and Steenkamp, 2008; Thakur and Hale, 2013; Falk, 2014) or qualitative case studies examining a few firms (Velikanov *et al.*, 2012; Zolnowski, Weiss and Bohmann, 2014), this study uses a mixed-methods approach to provide a holistic view of servitization at an industry level. Mixed methods research is relatively limited in services research as identified by Benoit *et al.*, (2017) who found that only 5.6% of servitization papers with an empirical foundation and 10.3% of papers with a conceptual foundation utilize a mixed methods approach. The use of mixed methods provides the additional advantage of providing a more complete picture of the phenomena being studied, allowing for validation of results through triangulation (Hantrais, 2014). Our third research contribution is the application of a mixed methods approach guided by grounded theory method.

The remainder of the paper continues with an overview of servitization theory and the context of the study. Consistent with grounded theory methods, the full literature review

was delayed until the completion of the research to avoid apriori theorizing (Glaser and Strauss, 2005). This introduction is followed by a discussion of the research methodology used. Consistent with the grounded theory approach, the research findings are closely examined with comparison against extant research, showing similarities and new avenues for study. The findings of the two phases of the grounded theory research (QGT and elite Interviews) are discussed in detail. Finally, conclusions, implications and limitations of the research are also discussed.

2.0 LITERATURE REVIEW

2.1 Servitization

Servitization is defined as “The transformation processes whereby a company shifts from a product-centric to a service-centric business model and logic.” (Kowalkowski *et al.*, 2017, p. 8). For manufacturers, the servitization process can include the transformation of a firm’s strategy (Raddats and Burton, 2011; Gaiardelli *et al.*, 2014), business model (Teece, 2010; Paiola *et al.*, 2012; Visnjic and Van Looy, 2013; Kowalkowski *et al.*, 2017), offerings (Kindström and Kowalkowski, 2009; Ulaga and Reinartz, 2011), culture (Dubruc, Peillon and Farah, 2014; Kreye, 2016), and operational capabilities (Raddats *et al.*, 2014; Smith, Maull and Ng, 2014; Hock, Clauss and Schulz, 2016). Manufacturing firms see servitization as a way to increase competitiveness (Baines and Shi, 2015; Kamp and Parry, 2017) by enhancing the value they provide to customers (Bustinza *et al.*, 2015; Cenamor *et al.*, 2017). Servitization can also be a way to capitalize upon manufacturing based knowledge to develop customization services within the manufacturing value chain (Spring and Araujo, 2013). In examining the organizational environment’s impact on servitization, Turunen & Finne (2014) suggest that the adoption of servitization by multiple firms within a single industry may accelerate servitization requirements for the industry as a whole by changing customer expectations within the industry. While servitization is, by definition, a transformation process and difficult to measure, the level of servitization at a given point in time can be quantitatively measured by comparing the service revenues against total revenues (Fang, Palmatier and Steenkamp, 2008).

While acknowledging the benefits of servitization, research indicates that success in servitization is not predetermined. A number of studies (Fang, Palmatier and Steenkamp, 2008; Neely, Benedetinni and Visnjic, 2011; Bandinelli and Gamberi, 2012; Ahamed, Kamoshida and Inohara, 2013; Hou and Neely, 2013) have identified the challenges in servitizing successfully, including the need to look at servitization from a holistic business model perspective (Kowalkowski *et al.*, 2012). Servitization requires new skills and abilities

for the organization (Weeks, 2010; Erasmus and Weeks, 2012; Azim, Subki and Yusof, 2018) and may require jointly developed skills and capabilities with partners and customers in order to successfully deploy new services as part of the servitization process (Raddats *et al.*, 2017). The process of servitization is not necessarily a smooth one, with some firms making short-term gains only to fail to reach critical mass and thus profitability (Kastalli and Van Looy, 2013). Many firms cannot increase the value of their firm through servitization (Fang, Palmatier and Steenkamp, 2008) and some firms subsequently go through a process of deservitization (Valtakoski, 2017). Furthermore, the difficulty of developing service solutions extends beyond the firm itself into the ability to integrate with the end customer (Brax and Jonsson, 2009).

Successful servitization may not result in pure service-focused strategy (Mathieu, 2001; Oliva and Kallenberg, 2003), but rather hybrid approaches combining a product and service focus (Burton *et al.*, 2017). The final outcome of the servitization process may result in different forms of servitization including: becoming a highly servitized availability provider focused on use-oriented services, a performance provider offering customized solutions or an industrialized provider with highly standardized solutions which are scalable and repeatable (Kowalkowski *et al.*, 2015). Firms may also develop different types of services ranging from basic services (product centric services) to advanced services (which go beyond the product to the customers unique needs) with advanced services offering greater profitability (Sousa and da Silveira, 2017).

2.2 The Effect of Culture on Servitization

Culture can be defined as an informal construct which is shared by a group of individuals identifying how to accomplish things, including shared operating procedures and assumptions (Triandis, 2001). National culture and value system can influence organizational culture and value systems (Hofstede, 1985; 2011). Culture can also be an industry level dynamic as well as an organizational dynamic, with research demonstrating industry as being a moderating influence on culture-performance (Gordon, 1991), and further indicating that the fit of an organizations culture within the industry culture can be a moderating factor on the organizations revenue growth (Christensen and Gordon, 1999). Organizational culture is specific in that its focus is on how the organization accomplishes things (Watkins, 2013) and the basic assumptions which define the core of how an organization operates and reacts to the external environment (Schein, 1984). National culture shifts the focus from the organization to the broader context of a group with a common national identity and can be defined as the “*shared implicit beliefs and tacit values*

that truly differentiate one cultural group from another”, (Taras, Steel and Kirkman, 2011, p. 190). Fayolle et al (2010) have proposed a three layered model of culture with national, industry, and corporate culture influencing entrepreneurial orientation. This multi-layered aspect of culture is often ignored in servitization research, with studies including culture, focusing at one specific level; and with many servitization studies ignoring the impact of culture altogether. This creates a gap in the extant knowledge of how culture impacts servitization.

Existing research provides many indications that the firm’s national culture can impact organizational culture. For instance, a firm’s national culture and values can have significant impact on how firms develop trust (Doney, Cannon and Mullen, 1998), it also influences the adoption of organizational routines (Massini *et al.*, 2002), and can impact the organization’s ability to implement strategic initiatives (Karube *et al.*, 2009).

While organizational culture can be influenced by the organization’s national culture (Hofstede, 1994; Minkov *et al.*, 2010), the ability of national culture to predict specific corporate outcomes or individual outcomes is unclear (Taras, Kirkman and Steel, 2010). The impact of national culture on corporate activity was demonstrated in a study of sustainability initiatives which identified how national culture characteristics influenced the implementation of sustainability programs (Tata and Prasad, 2015). Another example is a recent study in Japan which identified challenges in Japanese manufacturing firms to servitization including a “*lack of mindset*” which was defined as lacking a crisis mentality, adherence to product focus, and a fear of the new service business (Toya *et al.*, 2016, p. 262). Despite the impact of servitization on a company’s culture (Dubruc *et al.*, 2014), and the impact of national culture on workplace outcomes (Taras, Steel and Kirkman, 2011) and the afore mentioned impact of national culture on organizational culture (Minkov *et al.*, 2010)), the servitization research addressing culture has historically focused solely upon organizational culture (Weeks, 2010; Hock, Clauss and Schulz, 2016) without addressing how national culture can impact servitization.

2.3 Culture, Cognition, and Servitization Intent

In order for a firm to pursue some future level of servitization, either the organization, or individuals within the organization must have a cognitive desire to reach this future level of servitization, with this cognitive desire being described as servitization intent (Crowley, Burton and Zolkiewski, 2018b). However, the management tensions associated with servitization (Burton *et al.*, 2016) resulting from varied cognitive intentions of the individuals within an organization (Searle, 1983) may result in dissonance in

servitization intent within the organization, and as such create a barrier to servitization (Coreynen *et al.*, 2017; Crowley, Burton and Zolkiewski, 2018b). At an organization level, cognition related to servitization has been labelled the organizational logic, with this organizational logic being either conducive to servitization or a barrier to servitization (Coreynen and Matthyssens, 2015). At the individual level, cognition and resulting individual actions including evangelizing and bootlegging have been identified as factors in overcoming challenges to servitization (Lenka *et al.*, 2018a). Thus, cognition is a factor at both the individual and organizational level during the servitization process. While the interplay between culture, servitization and organizational dynamics (including cognition) is recognized, it's understanding is limited (Kowalkowski *et al.*, 2017) as is the understanding of the role of individual cognition and actions relative to the organizational dynamics associated with servitization (Lenka *et al.*, 2018a). Thus, the lack of understanding of the interplay of culture, cognition, and servitization at the industry, organization, and individual level represents a gap in the current field of servitization knowledge.

3.0 RESEARCH APPROACH

3.1 Research Theme and Questions

Grounded theory research begins with “*sensitizing concepts and general disciplinary perspectives*” (Charmaz and Charmaz, 2006, p. 11) which guide the research questions. The lead researcher’s background in an industry which had experienced a significant level of servitization, combined with the co-researchers experience in servitization research and industry, led to our initial premise, which was that there are dynamics associated with the servitization of an industry, similar to the dynamics associated with servitization at an individual company level. The initial research questions associated with this concept included:

1. How has the level of servitization evolved for the OP industry as a whole and for individual or groups of firms within the industry?
2. If the OP industry as a whole is servitizing; is the servitization process consistent for all firms within the industry (or groups of firms in the industry) and are there differences in how firms servitize?

Consistent with grounded theory tenants, the research questions evolved through the subsequent stages of the research based upon the results from the data and the iterative nature of data gathering with each subsequent wave of data collection being influenced by the prior data results (Glaser and Strauss, 2005). This evolution resulted in the research question:

3. Why are firms with headquarters in North America servitizing at a faster rate than firms with headquarters in Japan?

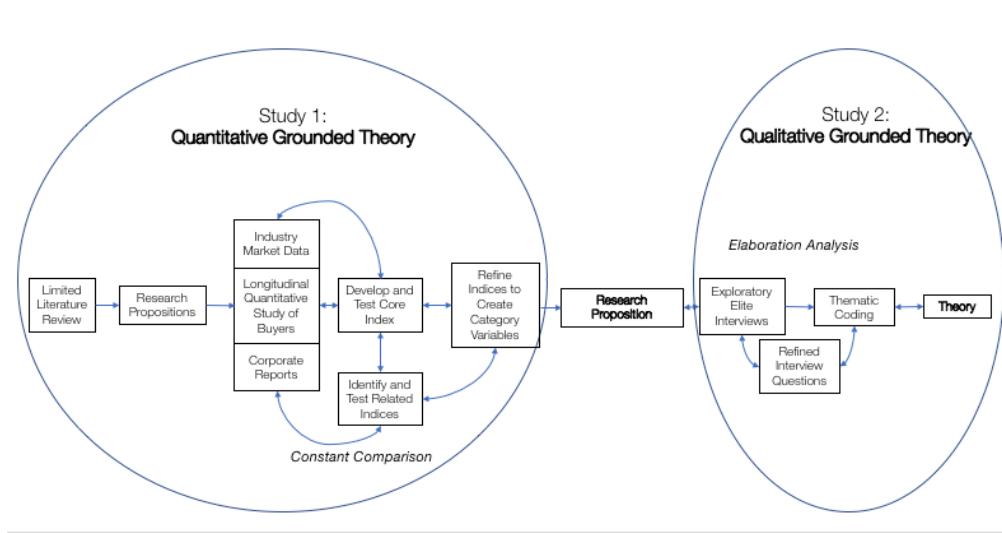
3.2 Research Method

Grounded theory is adopted in this research (Simmons, 2011). The research method utilized both quantitative grounded theory (QGT) (Glaser, 2008) and qualitative grounded theory (Glaser and Strauss, 2008) to analyse a quantitative survey and industry data, in addition to elite interviews (Moyser, 2006; Hochschild, 2015) with key executives in the industry.

3.3 Research Process

The research was conducted in two phases with the first phase using the quantitative grounded theory method to analyse a longitudinal study of decision makers responsible for services purchasing decisions in addition to corporate reports and market data from a leading OP Industry research firm. Whilst the first phase identified differences between groups of firms, the results could not explain why these differences existed. Therefore, consistent with the iterative inductive approach of grounded theory (Glaser and Strauss, 2008), a second phase of research was conducted using elite interviews to understand these differences. Elite interviews were selected based upon their usefulness in exploring topics in-depth with experts who can provide first hand observations on a topic (Moyser, 2006) and in obtaining expanded insight for results from other research studies (Hochschild, 2015). The research process in Figure 5 demonstrates the two phases of the research with the theoretical proposition from phase 1 providing a foundation for the second phase of qualitative research, which produced the final theoretical contribution.

Figure 5: Research Process



3.4 Subject Industry: The Office Products Industry

The OP industry consists of firms that manufacture office equipment including copiers, printers, faxes, and multifunction devices that are typically associated with printing and copying documents. The OP industry began the process of servitization in the 1960's when Xerox adopted a services based pay-for-use model to market early copier products, but was subsequently forced to move away from servitization due to government regulation (Finne, Brax and Holmström, 2013). By the late 1990's Xerox and the remaining OP industry manufacturers began shifting to services again and have been cited as early adopters of services (Finne, Brax and Holmström, 2013; Visintin, 2014). This shift to services was accelerated by the emergence of intelligent device capabilities and ubiquitous network connectivity built into office equipment which enabled remote monitoring, preventive maintenance, and other product centric services (Grubic, 2014b). Initially, manufacturers developed services focused on fleet management called Managed Print Services or MPS (Visintin, 2014) with these services evolving to include more complex outcome based services such as business process outsourcing, business process optimization, and IT integration (Ahamed, Kamoshida and Inohara, 2013) as evidenced by Xerox's outsourcing of key processes and infrastructure elements for the New Jersey Turn-Pike Authority (Xerox, 2010). More recently, some firms within the industry began experiencing deservitization (Valtakoski, 2017) where firms move away from a services centric model back to a product centric model.

3.5 Data Sources

There are four primary sources of data for this research. The first is the MPS Decision Maker Tracking Study™ (DMTS) which is conducted by the Photizo Group (a leading research firm for the OP Industry) for clients on a multi-client basis in order to capture key brand metrics for participants in the OP market (Photizo Group, 2012). The study was conducted from 2008 through 2012 in the US, Canada, UK, Germany, France, Netherlands, Belgium, India, China, and Australia with 5,913 decision makers responsible for obtaining and managing service contracts with OP providers¹. Respondents for this study were randomly selected from business-to-business research panels such as uSamp™ and Luth Research. This data source is particularly useful in providing new research insights since it provides a customer perspective of services.

The second data source is the publicly released financial statements for the top 14 manufacturers in the industry from 2008 through 2012. A third data source is the service

¹ . The distribution of survey respondents by year and country is available on request from the authors.

revenues which is taken from a leading market tracking firm for the OP industry for the period from 2008 through 2012 (Stewart, 2012). The fourth data source is elite interviews with 13 senior executives in OP industry manufacturing firms which are in the process of servitization and which represent over 80% of the industry's revenues. Executives represented firms headquartered in Japan and USA, with interviews taking place in the USA, Europe, and Japan from 2013 through 2015.

4.0 PHASE 1: USING QUANTITATIVE GROUNDED THEORY TO UNDERSTAND OP INDUSTRY SERVITIZATION

For this research the quantitative grounded theory method (Glaser 2008) was utilized to analyse the data from the DMTS, total OP revenue data, and the OP services revenue data. Quantitative grounded theory was selected due to the suitability of this method for addressing complex industrial research questions and the ability of grounded theory to link to practice (Martin, 1986; Locke, 2001; Wagner, Lukassen and Mahlendorf, 2010). While the grounded theory method is typically associated with qualitative research, it was intended to be a method that could be used with either qualitative or quantitative data (Glaser, 1999).

This research utilizes an objectivist grounded theory model where the researcher is an objective neutral observer (Simmons, 2011), but with knowledge of the subject based upon practice experience and a preliminary literature review which was utilized to frame the research questions (Goulding, 1998).

Initially, the core index and the crude indices (or variables) that could generate theory (Glaser, 2008) were identified by comparing all of the variables from the company data in order to determine if there was any directional relationship between the variables. The level of servitization was identified as the core index since it provides a direct measure of evolution of servitization over the research period and as such is central to the research questions. An iterative process of exploring the data using cross-tabulations and principle factor analysis identified two indices which had a positive directional relationship with the core index variable (Glaser, 2008): the service offerings included in the service contract and the service results obtained by the customer from the service contract.

In line with Glaser (2008) the next step after identifying the indices was to create composite indices based upon combining individual variables. In order to develop theory, the final step involved analysing the relationship of the composite indices to each other and to the core index, with the intention of theory emerging from this analysis.

Consistent with the approach identified by Fang et al (2008) the measure of the level of servitization in this analysis is performed by comparing service revenues to total revenues.

For the OP industry the level of servitization is calculated by comparing the total OP revenues (Jamieson, 2013) to the OP service revenues (Photizo Group, 2013) to derive a percentage of total revenue contributed by services. As shown in Table 18 service revenues grew from 10% of total industry revenues in 2008 to 23% of total industry revenues by 2011. This level of servitization is within the threshold defined by Fang et al (2008) of 20-30% servitization required to positively impact the value of the firm. Several firms were achieving even higher levels of servitization than the industry average, such as Xerox, who reached over 50% servitization by the end of 2012 (Xerox, 2013).

Table 18: OP Industry Servitization Level

	2008	2009	2010	2011	2012
Servitization %	10%	14%	18%	20%	23%

Sources: Publicly released financial statements, (Stewart 2012), MPS market report (Photizo Group, 2013)

A single service contract with an OP customer can contain multiple elements, including both product-centric and customer-outcome-centric elements. Service offerings could include the 31 contract elements (or service offerings) which were developed based upon the answers to the DMTS question asking “Which of the items listed below are included, or will be included, in your Managed Print Services (MPS) agreement?”(Photizo Group, 2012). A principle component factor analysis (PCA) was used to identify the response groupings in order to create the indices for major categories of service offerings. By examining the resulting indices we can understand what types of services the customers are engaging in, and how the mix of services are changing over time. Only respondents who currently have a service contract were included in the PCA (3,946).

The PCA used the 31 contract component items with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sample adequacy for analysis, KMO=.941 (‘superb’ according to (Field, 2009) , and KMO values for individual items were > .65 (most were above .78) which is well above the acceptable limit of .5 (Field, 2009). Bartlett’s test of sphericity $\chi^2(496) = 11841.941$, $p < .001$ indicates that correlations between items were sufficiently large for PCA. An initial analysis obtained eigenvalues for each component in the data. Six components had eigenvalues over Kaiser’s criterion of 1 (Field, 2009) and, in combination, explained 42.9% of the variance.

Given the large sample size (3,946), and the convergence of the scree plot and the KMO values of > .65 (Field, 2009) on the six components, the components were retained for the final analysis. Labels were assigned to the six PCA components based upon the best-fit description given the individual service offerings contained within each PCA component.

The components are: product fleet management, document outsourcing and change management, product deployment and support, product service and maintenance, continuous service support, and other. The other category consists of responses to an open-ended question to capture any additional responses beyond the pre-coded responses. A wide variety of responses were received to this question. We utilize these components as indices. Two of the indices: document outsourcing/change management, and product deployment and support consist of items which are focused on customer outcomes such as document disposal, document recycling, document offsite storage, device installation, and help desk services. The remaining indices are product centric activities such as providing product service, device replacement, and developing print guidelines.

There are a number of existing service typologies including classifying service specificity and organisational intensity (Mathieu, 2001), the type of customer relationship versus the focus of the service (Oliva and Kallenberg, 2003), the value proposition provided by the service versus the recipient of the service (Ulaga and Reinartz, 2011), and a meta-model which attempts to combine all of these approaches using three axis of comparison, the offering orientation, the nature of the provider to customer interaction, and the service offering focus (Gaiardelli et al., 2014). All of these approaches share a similarity in that they define a spectrum of service offerings ranging from services focused on the product to services focused on customer outcomes. Appendix 2 displays the 31 service contract components grouped into the six indices based on the PCA output compared against existing typology categories. Table 19 provides a description of the six summary indices produced by the PCA analysis. The two outcome centric indices (PCA3: Document Outsourcing and Change Management and PCA4: Product Deployment and Support) align well with outcome centric categories in existing typologies. The product centric indices also align well with the product centric categories in existing typologies. By collapsing the four product centric indices ('Product Fleet Management', 'Product Service and Maintenance', 'Continuous Service Support', and 'Other') into a new composite index called Product Centric Services, further clarity can be obtained into the relationship with the core index of servitization. Likewise, by collapsing the two outcome centric indices ('Document Outsourcing and Change Management' and 'Product Deployment and Support') into a new composite index called 'Outcome Focused Services' the clarity of the indices relationship to servitization can be improved. Table 13 shows the two new indices and their individual service components.

Table 19: Service Offering Indices

<i>Service Offering</i>	PCA Indices	Composite Indices
<i>Reporting of device utilization</i> <i>Recommendation on device deployment</i> <i>Reporting of device maintenance actions</i> <i>Monitoring of device utilization</i> <i>Implementation of document workflow software/solutions including document management archiving, or retrieval systems</i> <i>Remote monitoring of device for supplies</i> <i>Print policy or guideline</i> <i>Print rules to direct print to specific devices based upon document</i> <i>Physical survey to identify user needs</i> <i>Assessment of end-user requirements</i> <i>Vendor can replace devices that are currently installed</i>	PCA1: Product Fleet Management	Product Centric
<i>Providing 9 hours x 5 day service</i> <i>Providing 4 hour response time (for service calls)</i> <i>Physically moving device to new locations</i> <i>Manual recording of meter reads</i>	PCA2: Product Service and Maintenance	
<i>Providing 24 hour x 7 day service</i> <i>Providing 2 hour response time (for service calls)</i>	PCA5: Continuous Service Support	
<i>Other (please specify)</i>	PCA 6: Other	
<i>Document disposal</i> <i>Document recycling services</i> <i>Document offsite storage</i> <i>Change management communication</i> <i>Device installation</i> <i>Assessment of device utilization</i> <i>Help desk services</i> <i>End user training</i> <i>Automatic supplies replenishment</i> <i>Assessment of document workflow</i>	PCA3: Document Outsourcing and Change Management	Outcome Centric
	PCA 4: Product Deployment and Support	

By summing all of the respondents' contract elements into these two indexes it is possible to identify the proportion of total contract elements which are product centric versus those that are customer outcome focused. From 2008 through 2012 the product centric index declined from 66% of the contract elements in 2008 to 56% of the contract elements in 2012, while customer outcome centric index increased from 34% of 44% today. These results are shown in Table 20.

Table 20: Proportion of Customer Outcome Centric Offerings Offerings in MPS Contracts

	2008	2009	2010	2011	2012	Growth
Product Centric Service Items in Contracts	66%	69%	67%	54%	56%	-10%
Customer Outcome Service Items in Contracts	34%	31%	33%	46%	44%	10%

Source: (Photizo 2012)

This evolution of customer outcome service offerings by OP manufacturers is consistent with prior research identifying an evolution of services from product centric to customer outcome centric offerings (Batista *et al.*, 2015; Rönnerberg Sjödin *et al.*, 2016) and recognition of a need to switch from process to outcome measurement (Zolkiewski *et al.*, 2017).

4.1 Service Results

The service results index is based upon the DMTS question “In regards to your fleet of imaging devices, which of the following do you feel you have accomplished?” (Photizo 2012) which identifies the outcomes achieved from the service engagement. Table 21 provides the potential responses for this index. Responses are measured in terms of the percentage of respondents who have achieved the results identified by the index. This complements the measure of service offerings in that it provides an indication of the effectiveness of vendor’s services in producing the results for the service customers.

Table 21: Service Contract Results

Service Results	Outcome Type
Q31_1: Understands the cost for all hardcopy devices Q31_2: Has centralised decision making for the entire fleet Q31_3: Has assessed the fleet Q31_6: Has implemented a plan with the vendor for ongoing, proactive monitoring of the fleet	PRODUCT CENTRIC
Q31_5: Has made efforts to reduce hardcopy costs Q31_10 Has taken steps to assure have right size fleet Q31_4: Has taken steps to consolidate the fleet and adjust the device per employee	
Q31_7: Has implemented new document capture capabilities such as scanning documents and automatically routing them to pre-defined recipients or archives Q31_12 Has created doc of the workflow capability of the fleet: Q31_13 Has modified business workflows using document management solutions and training:	CUSTOMER OUTCOME CENTRIC
Q31_8: Has engaged with a vendor to conduct an analysis of the business process in order to identify ways to make these processes more efficient Q31_9: Based upon the results of a workflow process analysis, has engaged a vendor to improve these processes by implementing document related technology which results in a more efficient process Q31_11 Has optimised one or more business processes:	

In order to explore this dynamic further the services results indices were aggregated to create two new indices named product centric and customer outcome centric (Table 22).

Between 2008 and the end of 2011, the product centric index grew by 10% versus the customer outcome centric service which grew by 21% (Table 22). This data suggests that as the level of industry servitization increases, manufacturers begin offering more customer outcome centric services, consistent with the shift from a goods-dominant logic to a services-dominant logic proposed by Salonen (2011).

Table 22: Service Results for Product vs. Customer Centric Outcomes

	2008	2009	2010	2011	2012	Growth
Stage 1-2: Product Centric	49%	55%	48%	49%	59%	10%
Stage 3-4: Customer Outcome	19%	27%	31%	28%	40%	21%

Source: (Photizo 2012)

The results of this analysis of industry data has a high degree of alignment with current theoretical frameworks developed to describe the servitization of individual firms with both offerings and results being categorized into product centric and customer centric outcome indices which can be aligned with existing models for describing framing servitization (Raddats & Burton, 2011). Given the alignment of industry data to servitization frameworks developed for individual companies or even unrelated groups of companies, this data would indicate that existing servitization models also apply to industry servitization. In this sense, the data validates existing theory. The data were also investigated at a firm level. This showed some interesting differences. Based on cross tabulations of the index, differences emerged between firms with headquarters in America versus those with headquarters in Japan.

4.2 Japanese Versus US Firms

Based upon cross tabulations of the core index, servitization level, the US headquartered firms had a significantly higher level of servitization relative to the Japanese headquartered firms. US firms grew from 16% of revenues coming from services in 2008 to 39% of revenue coming from services in 2012. Conversely, the Japanese firms grew from 5% of revenues coming from services to 11% coming from services during the same time period. The gap in servitization levels between US and Japanese firms grew from 11% in 2008 to 28% in 2012. These results are shown in Table 23.

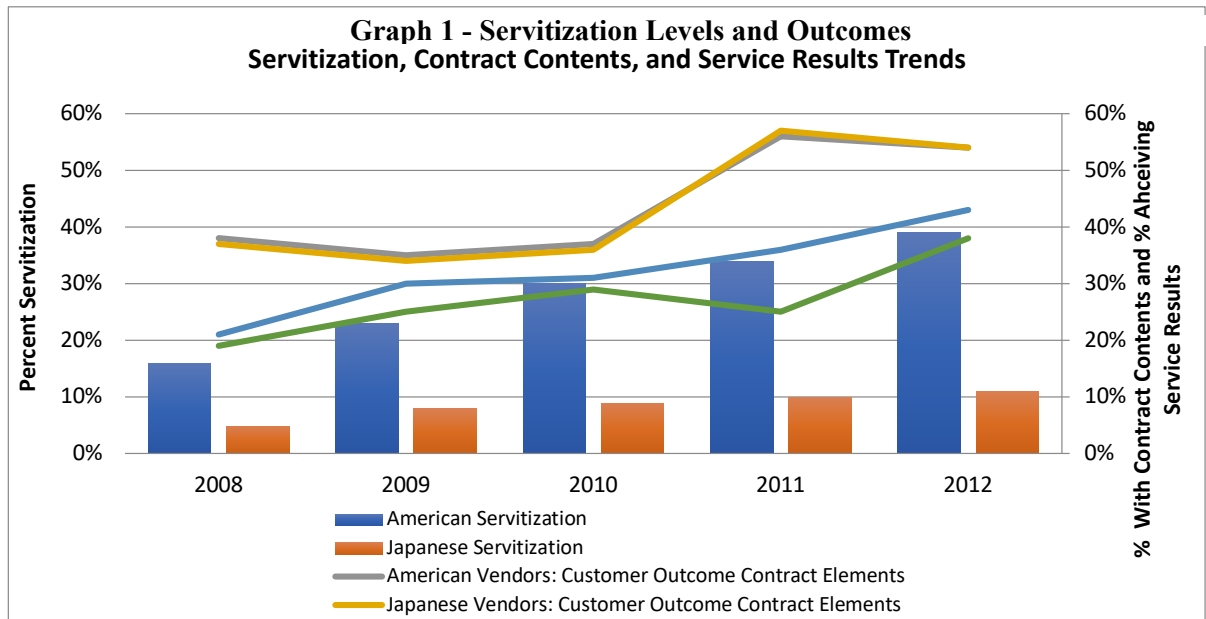
Table 23: Servitization Level Percentage by HQ Location

	Year				
	2008	2009	2010	2011	2012
US	16%	23%	30%	34%	39%
Japanese	5%	8%	9%	10%	11%
Difference	-11%	-15%	-21%	-24%	-28%
Industry Average	10%	14%	18%	20%	23%

Source: (Photizo 2012)

The same approach was utilized to analyse the service offerings indices to search for differences between US and Japanese firms. Interestingly, the amount of customer-outcome centric service offerings were almost identical for US and Japanese firms. In 2008 Japanese firms had 37% of the service offerings being customer-outcome-centric while US firms had 38% of the service offerings being customer-outcome-centric. By 2012 this proportion had grown by almost the same amount for both Japanese firms (17% increase) and US firms (16% increase). Likewise, when analysing the proportion of results which were customer-outcome centric, a similar trend emerged with both US and Japanese firms showing similar levels of customer outcome centric results at the beginning of the study and similar rates of growth through the study period. The results are shown Graph 2 (as well as Table in Appendix 3). These results indicate that Japanese firms were offering comparable services to US firms in this period and producing similar outcomes.

Graph 1 compares all three indices (servitization level, customer centric service offerings, and customer outcome focused results) for Japanese firms and US firms (based upon Table included in Appendix 3).



Based upon the results from the first phase of research there appears to be a barrier to the Japanese firms achieving the same level of servitization as US firms which is not linked to either the service offering provided by the vendors or the service results being achieved by customers. This can be seen in the gap between US and Japanese firms in terms of servitization levels (as defined by service revenues as a percent of total revenue (Fang, Palmatier and Steenkamp, 2008), despite both Japanese and US firms offering similar services and obtaining similar customer outcomes, thus Japanese firms appear to be suffering from the service paradox as defined by investing in servitization to drive service revenue growth, but failing to achieve this growth (Gebauer, Fleisch and Friedli, 2005). Hence, the research proposition:

(RP:1) Headquarters location affects the level of servitization.

In order to explore this research proposition and understand why Japanese firms were performing differently, a second phase of research was conducted using elite interviews with key executives in the industry representing both US and Japanese OP Industry firms.

5.0 PHASE 2: QUALITATIVE GROUNDED THEORY USING ELITE INTERVIEWS

For this phase of the research elite interviews were held with executives holding senior positions at OPI firms with responsibility directly or indirectly related to the firms efforts to develop a services business. Elite interviews are generally considered to be interviews with individuals who have senior positions with an ability to influence decisions relevant to the research topic (Harvey, 2010). Interviewees were selected using purposive convenience sampling (Trotter, 2012) based upon the availability of executives. The goal was to interview the highest level executive possible since these executives would have the most comprehensive view of the organizations' operations and servitization process (Kincaid and Bright, 1957). While two organizations limited interviews to a single, senior individual, multiple executives were interviewed at the other four in order to gain a comprehensive set of viewpoints. This approach of using multiple sources assists in minimizing the chance that the respondents provide a 'party-line' (Berry, 2002). The roles of the participants and the location of their company's headquarters are listed in Table 24.

Table 24: Elite Interview Participants		
Organization /HQ Location	Title	Executive Location
Organization A - America	Executive VP	America
Organization B - Japan	Corporate Director	Japan
Organization B - Japan	General Manager (Services)	Japan
Organization B - Japan	Marketing Director (Europe)	Europe
Organization C - America	Executive VP/GM	America
Organization C - America	VP Sales	Europe
Organization D - Japan	Channel Executive	America
Organization D – Japan	GM Marketing	Europe
Organization D – Japan	Product Manager	America
Organization D - Japan	Services Manager	Japan
Organization E - America	Global Vertical/Services Executive	America`
Organization F – Japan	Deputy General manager	Japan
Organization F - Japan	Senior VP	America

It is important to recognize that while individuals were interviewed in regions with distinct national cultures (i.e. Europe), organizational research indicates that their views will be reflective of that organization's national culture (van Oudenhoven, 2001).

To encourage cooperation the request for the interviews focused on a single topic request (Kincaid and Bright, 1957); specifically, for information about the firm's experience in the process of servitizing. Included with the interview request, each respondent was provided with a preliminary outline of the key questions in addition to a letter explaining the reason for the interview (Welch *et al.*, 2002). The interviews were conducted in environments that were most comfortable and convenient for the participants (Aberbach and Rockman, 2002), typically their office, but also in other neutral environments, including one interview which was conducted in a cafeteria during an industry conference.

The interviews were semi-structured, with a core set of ten questions addressing the research proposition from the first phase of the study indicating there is a difference based upon the headquarters location of the firm. The questionnaire was designed to profile each organization's servitization experience in order to identify similarities and differences between Japan and US headquartered firms. In order to gain the greatest depth of understanding into this dynamic of differences between Japanese and US headquartered firms, the questionnaire was designed to be open-ended in order to facilitate an open dialogue to facilitate insights into the factors which were affecting servitization for each firm. Interviews lasted between sixty and ninety minutes. The interviewer guide is included in Appendix 1. The questionnaire was designed to begin with general experiences in servitization and identify challenges in servitization. The question about whether there was an impact related to the headquarters location was asked last, in order to avoid 'leading' the interviewee. It is interesting, that in every case where the interviewee worked within a

Japanese headquartered company, direct or indirect references were made to the headquarters and culture having an impact on servitization, prior to this question being asked.

When interviewing elites, the perceived status relationship or differential between the interviewer and the interviewee can be an issue making it important for the interviewer to establish their position and credibility (Mikecz, 2012). Due to the lead researcher's experience in the industry, it was possible to gain access to senior executives directly involved with these firms' servitization efforts and to have immediate credibility and trust which is critical in interviewing elites (Moyser, 2006). As in the Professional Social Inquiry taxonomy (Smith, Dwyer and Prunty, 1981) the interviewer in this research is a professional / autocratic based upon his role as an industry consultant and analyst. This role provided an advantage in the interviewing process due to the interviewers' credibility and access, in addition to providing a knowledge base for accessing the validity of the respondents answers in relation to their role in the change process (Mullings, 1999; Berry, 2002). Additionally, this allowed the interviewer to provide a high degree of description regarding the participants and their multiple perspectives. However, it is difficult if not impossible to avoid some level of bias when conducting elite interviews when the interviewer has had prior exposure to the interviewees (Welch *et al.*, 2002). Self-representation is very critical in elite interview to establishing a power-balanced interview and in this instance, the interviewer clearly identified their role in this situation as a researcher, in essence establishing a balanced role as an impartial industry observer (Aberbach and Rockman, 2002).

In the second phase of this research, inductive analysis was applied to qualitative interview data (the elite interviews) in order to understand why Japanese firms were servitizing at a different rate than US firms. Coding is a critical element in analysing data from elite interviews. According to (Basil, 2003, p. 152), "*What coding does, above all, is to allow the researcher to communicate and connect with the data to facilitate the comprehension of the emerging phenomena and to generate theory grounded in the data.*" One challenge in the coding process is that the respondent's statements are addressing complex issues, which are context sensitive. NVivo was used as a tool to assist in coding process in order to achieve a greater degree of flexibility in analysing and viewing the data in order to better understand the relationships between categories (Bringer, 2006). The coding process began with line by line open coding, to ensure maximum saturation of codes and to avoid missing any important themes (Holton, 2007). This initially resulted in 242 individual codes. This was followed by axial coding where codes associated with the same

concept were combined into a single code. For example, “less print” and “less need for print” were combined into the code “reducing print”. This was an iterative process, with codes being constantly compared to subsequent interview transcripts and codes. Codes were then compiled into categories which represented ‘themes’ associated with the individual codes. There were a total of 24 themes identified from the codes including which could be grouped into three major groups: macro (industry), meso (organization), and meso-micro (cognitive). These are identified in Table 26.

Table 25 - Servitization Factors

Macro (Industry)	Meso (Organization)	Meso-Micro (Cognitive)
Customer Demand	Organization Structure*	What is Valued
Competitive Pressure	Skill Sets	Tradition
Regulations (Affecting Staff)	Path to Market	Belief in Services
Market Decline	Change in Leadership	Risk Tolerance
	Technology Enablement	Intentionality
	Financial Position	Perspective to Service
	Investment	Desire
	Business Model	Change Tolerance
		Trust
		Knowledge
		Commitment
		Conflicted Management Direction

* Shaded items varied between firms headquartered in Japan and firms headquartered in North America

These three groups can be seen as layers of factors relative to the focal point of the factors. For example, market decline is a macro, industry-wide factor affecting all of the firms in the industry. Conversely the meso, organization factors appear at the organizational level and may not be present in all organizations within the industry. Meso-micro factors appear at the individual or organizational level and relate to the individual or organizational cognition towards servitization.

5.1 Variation in Factors

While no variation was found between groups at a macro layer in terms of *industry* factors identified in the industry studied, at the meso layer one *organizational* factor was found to vary between groups, whereas at the deepest micro-meso layer, nine of the twelve *cognitive* factors varied between groups. Of the nine organization factors, organization structure was identified as a unique factor to each group of firms in that respondents in Japanese firms identified the independent geographic operating company structure common to Japanese firms as an inhibiting factor, while respondents from US firms identified the hierarchical corporate governance structure common to US firms as an enabler: compare “..corporate governances being done by the board members or executive committees or all

regional heads requires consensus so there could be long or complicated decision making process to do change on this transformation to the services business” (Organization B (Japanese based HQ), Corporate Director) with “if I can manage these devices and I bill the customers through a pay-for-use model, I can guarantee 100% loyalty on supplies, and it was a perfect bridge into saying you know your business model can be sustained but it has to be sustained in a different way, and even though this is what I do, I think that was the internal compelling business impact that was able to get people onboard internally” (Organization C (US based HQ), Executive VP/GM).

5.2 Cognitive Factors Affecting Servitization

The twelve cognitive factors all share commonality in that they are difficult to observe or measure. Three of these factors have been discussed in academic research including: knowledge (Gebauer *et al.*, 2015), commitment (Hock, Clauss and Schulz, 2016), and conflicted management direction (Barnett *et al.*, 2013). In the interviews, these three factors were common challenges faced by all firms regardless of headquarters’ location. The remaining nine factors were given very different emphasis by respondents from Japanese versus US firms. They include: what is valued, tradition, belief in services, risk tolerance, intentionality, perspective to service, desire, and change tolerance. The factors are summarized in Table 27.

Table 26 - Cognitive Factors

Cognitive Factor	Definition	Illustrative quote(s)
What is Valued	This factor relates to what is valued individually or as an organization or even a culture. It can reflect a role or status perception, or even the relationship of an individual to others.	"This relates to our society which places a high value on creating a belonging environment versus rules of participation." Organization C: (US) Executive VP-GM.
Tradition	A multifaceted factor which reflects the perceptions regarding what the core mission of the organization has been in the past, and the accepted norms for the organization and individual to accomplish this mission. It is often expressed in statements as a limiting factor that sets boundaries on what was possible.	"Worldwide I mean Japan is deep in tradition. I will tell you like it is, they are hardware manufacturers. They have facilities. They have to keep up and running. They have to produce a certain volume to be cost effective and financially solvent. If they are not able to do that then it is everybody's fault because you are not selling enough boxes." Organization D: (Japan) Channel Executive
Belief in Services	This was reflected in statements by respondents which indicated their perceptions or the organization's perceptions regarding services. This could be in relation to the potential for services to positively or negatively impact the firm, or whether it was possible for the organization to realize this potential and shift to services, or its importance in the long term sustainability of the organization.	"We've invested you know, for the future and really looking at the services mix in portfolio is critical for long term sustainability for you know, for the business." Organization C: (US) VP Sales "And I'm a big supporter of manage-print services because from a business standpoint, financial aspect of it, it's huge." Organization D: (Japan) Product Manager
Trust	Relates to trust as a factor in relationships, decision making, and governance. It was a very complex factor which was to some extent context sensitive based on whether it was addressing relationships, the belief in the potential of services, and/or past experiences in the attempt to servitize. In	"They did not believe us, you know, they said 'we have been down that road too many times. We invest all this money and then nothing transpires'" Organization D: (Japan) Channel Executive
Risk Tolerance	Respondents had very clear views of risk at both a personal and organizational level. Both in terms of the value of taking risks, the acceptability of taking risks as a cultural norm, and the willingness to take risks.	"and the risk averse kind of you know, culture". Organization D: (Japan) Product Manager
Intentionality	While intentionality and the following factor desire may seem similar, intentionality was characterised by respondents as the active movement towards services as realized by decisions to invest, re-allocate resources, and taking actions with a specific intent to shift the organization towards a services led model.	"You know, engaging a razor/razor blade model and turning it into a click charge where they only pay you every time they print something or you know scan something. That is a whole fundamental shift in how you measure the business, and there are a lot of techniques to gauging through this." Organization C: (US) Executive VP/GM
Perspective towards Service	The perspective to service is a complex idea that was articulated by respondents in several different ways. It could be the external (societal) view of the status (or lack thereof) and acceptability of services as a profession. Alternatively, it could be the individual's perception of what service is, and what it would mean for the organization to shift to services. It also related to the level of risk associated with the move to services.	"Japan firms do not see service the same way as non-Japanese firms. And this relates to our culture." Organization B (Japan) Executive VP/GM
Change Tolerance	This is another factor that has both an individual and an organizational context. It was referenced in terms of a level of willingness to embrace change, as well as the corollary attachment to the status quo.	"And then, as we look at the business and this is kinda where I came in is, you know, you can you know, do something radical which is a huge departure from your core business right?" Organization C: (US) VP of Sales "We have to maintain that 90% business, we have to maintain resources, sales resources and engineering resources every resource, we have to keep, to maintain 90% of the business." Organization B: (Japan) Marketing Director
Desire to Servitize	Whereas intentionality is an active motion, desire is the expression of reaching some future state, towards which active steps may or may not have been taken.	"they do not have the wherewithal and the patience and the desire to do it" Organization C: (US) Executive VP-GM "Komatsu or those manufacturers also shifting from a hardware business to services, right, so I think many Japanese firms are also recognizing the or the necessity of the servitization." Organization B (Japan) Marketing Director

The factors are very inter-related as demonstrated by this quote describing both a resistance to change and the impact of tradition on the organizations perception of how activities are performed, *"I think it started at the top so I think when you had people like that that had been in the hardware organization for so long, their definitely was this mentality*

that “*this is the way we have always done and it and we do not want change*” (Organization E (US) Global Vertical / Services Executive). Of particular interest, the two groups had very different responses for these nine factors indicating variation between the two groups at the cognitive (micro-meso) layer. This cognitive variation between groups at the micro-meso layer aligns with national cultural differences between the two groups of firms (firms with Headquarters locations in US versus those with Headquarters in Japan) indicating an influence of national culture on micro-meso layer cognitive factors.

6.0 DISCUSSION

The divergence of cognitive factors based upon the headquarters location of each group appears to indicate a national culture influence on cognitive factors related to servitization. This is consistent with previous business research which has identified variations business behaviour based upon national culture. For example, according to (Hofstede, 1994) the US culture has a higher feminine value which is associated with a higher value for services, while the Japanese culture has a higher masculine value which is associated with a low value for services. This was clearly demonstrated in the interviews with US firms seeing value in a servitization, but Japanese firms placing a much higher value on the manufacturing and often minimizing the value of servitization. Most respondents from Japanese companies cited a core belief being held in their companies that products are of higher value, with this belief often being reinforced by top executives (advertently or inadvertently): *"When the big conference three days, then it's all about services... 'blah, blah, blah, blah, blah, blah'. And then the CEO gets up at the end of the conference and says, 'Look, thanks so much for coming. And I can already see the future. But don't forget we got month end coming...and you (have) got to get the boxes out the door.'* And so everything that they had done,... in one fell swoop, one statement from the CEO absolutely flattened it, because it said, *'Look, we are not serious about it.'*" (Organization B (Japan) Marketing VP). In contrast US headquartered companies, interviewees expressed a strong belief in the value of pursuing opportunities of servitization: *"The companies that will seize that opportunity, are the ones that are able to change, and specifically can change by providing this as more of a solution service. No question in my mind."* (Organization C (US) Executive VP/GM).

The company's culture can be defined as the sentiments, beliefs, and attitudes of an organization (Ray, 1986). Based on this definition all twelve of the cognitive factors are associated with the organizational culture of the firms interviewed. Organizational culture is cited as a key issue in servitization both in terms of having a service culture (Gebauer and Friedli, 2005; Turunen and Toivonen, 2011) and in senior management leading the shift to

a service oriented mental model (Kowalkowski and Kindström, 2013). This research indicates that there are fundamental differences in US firms' organizational culture relative to Japanese firms' organizational culture, resulting in fundamental differences in their view towards services, how senior management led (or did not lead) the servitization effort, and even how they structured their service strategies and operations. Consistent with these findings, a study into the Japanese organizational culture decision making process identified barriers to implementing major strategic shifts such as servitization (Karube et al., 2009) due to elements of the Japanese business culture. In addition, research has found distinct differences between the culture and operations of Japanese and US firms (van Oudenhoven, 2001) consistent with the findings of this research.

In terms of risk tolerance, there was a clear difference between Japanese and US headquartered firms. Respondents from Japanese firms consistently expressed a strong resistance to taking significant risk which is very consistent with research on Japanese business culture indicating there is a growing conservatism in Japanese executives limiting their ability to successfully execute key strategic initiatives (such as servitization) that have a significant risk profile (Karube et al., 2009). Tradition, desire, intentionality, perspective to service, trust, change tolerance, and belief in services exhibited similar responses with opposing positions in US and Japanese headquartered firms. These factors could be influenced by national culture. It is contended that there are specific organizational cultural norms, which have been influenced by National cultural norms and which can be either drivers or s to firms' attempts to servitize their business. These factors and the national cultural factors affecting them are listed in Table 21.

Table 21: National Culture Impact

Cognitive Factor	Hofstede Model	US Value	Japanese Value	Servitization Impact
What is valued	Individualism vs. Collectivism	Individual	Collectivist	Makes it more difficult for service ‘leaders’ to drive change
Tradition	Indulgence Versus Restraint	Indulgence	Restraint	Can create organizational resistance service adoption
Belief in Services	Masculinity versus Femininity	Higher Feminine	Higher Masculine	Higher Feminine associated with higher value for service
Risk Tolerance	Uncertainty Avoidance Index	Low Avoidance	High Avoidance	Aversion to risk may reduce willingness to change
Intentionality	Power Distance Index	Higher Power Distance	Lower Power Distance	Alignment of intent in Japan may be more difficult due to requirement for high level of consensus
Perspective to Service	Masculinity versus Femininity	Higher Feminine	Higher Masculine	Higher Feminine associated with higher value for service
Desire	Indulgence vs. Restraint	High Indulgence	High Restraint	High restraint may make it more difficult for service leaders or visionaries to gain traction
Change Tolerance	Long Term Orientation	Normative (short-term)	Pragmatic (long-term)	Higher tolerance may accelerate servitization
Trust	Uncertainty Avoidance Index	Low Avoidance	High Avoidance	The discomfort with uncertainty in Japan and associated risk avoidance may create a due to the perceived risk associated with services by Japanese respondents.

Hofstede’s (1985) work on national culture’s impact on organizational culture has been expanded (Hofstede, 1994, 2015; Minkov *et al.*, 2010) and challenged (Taras, Kirkman and Steel, 2010), however, the underlying precept that national culture can impact organizational culture has been demonstrated with research in sustainability (Tata and Prasad, 2015) and research identifying how service innovation differs between India and

Australia (Alam, 2010). This study identifies nine organizational cultural dimensions and proposes links to specific national culture attributes (Hofstede, 1994; Minkov *et al.*, 2010).

Organizational culture can be a significant factor in servitization due to its effect on new service development (Burton *et al.*, 2017) and the difficulty of developing a service-centric culture in a traditionally product-centric manufacturing culture (Barnett *et al.*, 2013; Rabetino, Kohtamäki and Gebauer, 2017). Given the impact that national culture can effect upon organizational culture (Hofstede, 1985), one can contend that national culture would exert some degree of influence on servitization, given organizational cultures impact on servitization. At an individual level, the concept of deep cognitive structures based on national culture impacting normative processes (Hofstede, 2015) could be expected to impact servitization decisions. However, only a few research studies address directly or tangentially the impact of national culture on servitization (Metters, 2008; Engelen *et al.*, 2014), creating a gap in the existing knowledge of servitization.

In identifying the gap between US based firms' abilities to build service revenue versus Japanese firms, the results suggest that all Japanese MPS firms are suffering from the service paradox (Gebauer *et al.* 2005) to a greater extent than US headquartered organizations. Each of the Japan based firms included in the study has made public statements identifying their desire to grow services revenue by investing in services, a clear demonstration of servitization intent. An example is from Ricoh, which stated, "today (Ricoh) announced an investment designed to aggressively accelerate its shift to a services business model as a key growth strategy, building upon its core foundation of industry-leading hardware and software technologies and document and IT-related services. To advance this shift, Ricoh plans to invest \$300 million USD over three years in its global Managed Document Services (MDS) infrastructure" (Ricoch, 2011, p. 1) and even provided a very specific revenue growth target: "Ricoch's investment in its global MDS infrastructure is designed to strengthen its best practices approach and technologies across its global footprint and help the company achieve an annual MDS revenue target of \$3.3 billion USD by FY2013" (Ricoch, 2011, p. 1). At the time of this press release Ricoh's total services revenues were less than \$1.5 billion (USD). The desire to grow servitization levels (as identified by revenues) through investments in services infrastructure, combined with failure to reach these targets, is a clear example of the servitization paradox. Within this study of the OP Industry, the Servitization Gap created by this paradox is represented by the gap in servitization levels between US and Japanese firms. Based upon research by Sousa and da Silveira (2017) the expectation would be that firm offerings having the same mix of

advanced services (customer centric) and basic services (product centric), would have similar levels of servitization. However, this study demonstrates empirically that even though US and Japan based firms have the same mix of service offerings, the US firms are capturing a higher amount of service revenue (as demonstrated by their higher level of servitization).

The study identifies nine cognitive factors for servitization which are associated with organizational culture, and which appear to be influenced by Japanese national culture and potentially represent challenges to servitization. There have been many studies and business articles on the unique aspects of Japanese business culture (Karube *et al.*, 2009; Calantone, Di Benedetto and Song, 2010; Lehmberg, Dhanaraj and Funai, 2013), however, these studies do not address the impact of culture on servitization efforts. Toya *et al.*, (2016) identified that organizational culture dynamics in Japan do represent a challenge to servitization, and identified characteristics corroborating these findings. For example, the lack of customers' trust in service being a barrier to service adoption (Toya *et al.*, 2016) is consistent with the high national culture rating for masculinity in Japan (Hofstede, 1994), with high masculinity national cultures have a lower value for services. This research contributes to the understanding of how the Japanese national culture may be an inhibitor to successful servitization and sets the stage for further research to explore the national culture dynamic and its impact upon servitization in other industries.

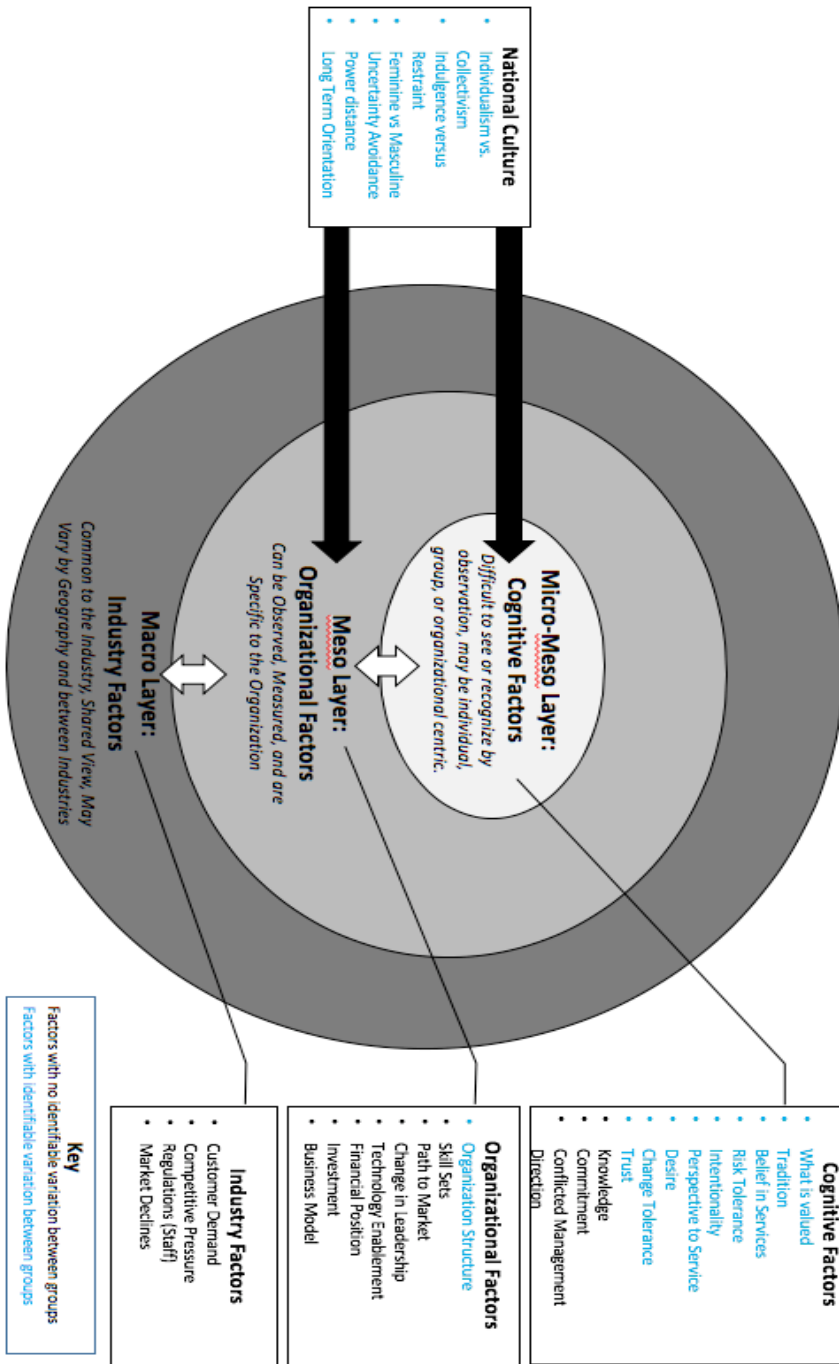
By applying these three layers of servitization factors (industry, organizational, and cognitive) we develop the three layered servitization factors model identified in Figure 6. This model presents a nuanced approach to examine the complex, and inter-related factors that can inhibit servitization. Importantly, it identifies the differences at a cognitive (micro-meso) layer which may be influenced by national culture.

The model identifies an industry layer of servitization factors (customer demand, competitive pressure, regulations, and market declines) which were impacting all organizations in the industry. The interviews indicated that competitors' servitization activities were influencing firms to pursue servitization, thus, providing an example of organizational activities influencing the industry level. Likewise, organizational servitization factors such as the organizational skills sets, influenced cognitive factors such as the desire to servitize as in the example of an interviewee identifying a lack of service skills in the organization leading executives to hold a belief (cognition) that they must take action to personally recruit key service talent into the organization. The cognitive factors such as the individual or groups risk tolerance level, also impacted the organizational layer

and even resulted in some organizations recruiting outside executives to lead the service initiative, in part, due to their higher level of risk tolerance (relative to the organization). Thus, while we articulate the layers are very distinct, they are very interconnected and permeable.

As the model indicates, national culture influences both the cognitive layer such as the example of the Japanese culture having a high uncertainty avoidance (Hofstede, 1994) appearing in the respondents from Japan indicating a reluctance around services due to the perceived high risk of services (cognitive factor) versus the traditional manufacturing centric business model. These national culture aspects also appear to impact organizational factors such as the organization structure which is traditionally structured around semi-autonomous country level units (organizational factor) which still require consensus in decision making across the organization (national cultural which values collectivism over individualism (Hofstede, 1994)), versus US organizations which tend to have more hierarchical global organization structures (organizational factor) but which encourage management decision making (national culture valuing individualism over collectivism (Hofstede, 1994)). This model builds upon existing research identifying individual behaviour and cognition as important aspects of servitization (Gebauer and Friedli, 2005; Baines *et al.*, 2013; Kreye, 2016; Rezazade Mehrizi and Lashkarbolouki, 2016; Vargo and Lusch, 2017; Lenka *et al.*, 2018a) and presents a nuanced view of servitization factors which incorporates cognition and national culture as important aspects of the model, thus moving beyond the paradigmatic assumptions of existing servitization models (Luoto, Brax and Kohtamäki, 2017) and expanding servitization theory.

Figure 6 – Layered Servitization



6.1 Research Contribution

Through the study of the cultural challenge of servitization within the context of layers of servitization factors including the difficult to observe ‘cognitive’ factors at individual group or organisational levels (micro-meso), observable ‘organizational’ factors (meso), and shared ‘industry’ level (macro) servitization factors our study makes three research contributions. The first contribution is based upon the longitudinal industry level analysis combined with customer-based data which validated existing research for servitization and its applicability at an industry level, while also uncovering two different levels of servitization within the industry based upon the national origin of the firms in the industry. Research addressing the impact of national culture on organizational culture has focused on the effect of the national culture in which the specific international business operation resides (Bhaskaran and Sukumaran, 2007; Pagel, Katz and Sheu, 2009; Yang *et al.*, 2015), which implicitly assumes the organization culture for that business operation is location specific. By examining data aggregated at the industry level and for individual manufacturers and groups of manufacturers, this research characterizes differences between groups of firms within the industry based upon the firm’s headquarters location, regardless of the individual business’ operation location. This research addresses the call for a deeper understanding of the impact of culture on servitization (Dubruc, Peillon and Farah, 2014) and the differences between eastern and western cultures and their impact on business (López-Duarte, Vidal-Suárez and González-Díaz, 2015). This research also addressed the need for the customer view of servitization (Tuli, Kohli and Bharadwaj, 2007; Valtakoski, 2017).

The second contribution is a new layered model for categorizing the factors impacting servitization by addressing the organizational cultural factors which differ based on national culture, while also incorporating the micro-meso layer (cognitive), meso layer (organizational), and macro layer (industry) servitization factors. This model does not replace existing models but rather supplements them by providing another dimension for viewing factors relevant to servitization development. The research may help explain some of the factors behind the servitization paradox (Gebauer, Fleisch and Friedli, 2005) and firms failing to reach a critical mass in their servitization efforts despite making significant investments in servitization efforts.

The third and final contribution is demonstrating the value of applying a grounded theory based mixed methods research design to explore servitization through the dual lens of industry and organizational perspectives. By combining qualitative and quantitative

grounded theory studies, this becomes a mixed methods design. “*Despite the prevalence of mixed methods and grounded theory research, the combination of the two is relatively nascent.*” (Guetterman *et al.*, 2017, p. 2) making this study relatively unique in its methodological approach. Furthermore, this study also addresses a need for more quantitative research in servitization (Jacob and Ulaga, 2008; Kucza, Kucza and Gebauer, 2011; Aarikka-Stenroos and Jaakkola, 2012).

7. MANAGEMENT IMPLICATIONS

This study demonstrates this challenge of servitization at an industry level by providing insight into a highly servitized industry where one group of firms is realizing significant services revenue growth which far outpaces the second group, despite both groups of firms providing similar service offerings and producing similar service results for the customer. As more firms (and industries) begin the process of servitization, this study provides further evidence that just building a service offering does not guarantee service revenue growth. It also raises significant implications for national policy as services become an increasingly important factor for many countries’ economies (Buera and Kaboski, 2009) in both developing and developed economies (Loungani and Mishra, 2014) in order to maintain the competitiveness of their manufacturing industries (Bajpai and Radjou, 1999). This could be particularly critical for countries, such as Japan, which have a high concentration of manufacturing firms (in this case OP Industry) that play a significant role in the economy.

The conflict between a product approach based on standardization and production efficiency and the services approach focused upon customization to customer requirements and value co-creation can create an ambivalence through the organization in relation to services (Lenka *et al.*, 2018b). The model proposed in this paper should help managers to identify individual factors impacting servitization at three levels and shift focus beyond the industry and organizational levels in order to address the cognitive factors which may be inhibiting their servitization efforts. Given the national culture effect on cognitive attributes which we have identified, it is very important for Japanese firms to be aware of the cognitive factors such as the value placed on making products and risk aversion and its potential impact on the risk associated with changing to a services business model when considering servitization strategies. Driving change to the cultural and cognitive factors which are inhibiting Japanese manufacturers in the OP industry may require applying a complex adaptive systems approach, rather than traditional linear deterministic approaches (Erasmus and Weeks, 2012). This may include applying new approaches to organizational change such

as focusing on cognitive and behavioural dynamics to ‘unlearn’ the cognitive aspects associated with the traditional business model (Rezazade Mehrizi and Lashkarbolouki, 2016).

One of the interviewees identified cultural resistance (associated with cognitive factors) as being a sort of gravity which affects even small decisions throughout the organization. This research proposes that management must take intentional actions to create an organizational velocity to break free of this gravity and avoid the servitization paradox. For Japanese firms, this gravity appears to be stronger, creating a need for even greater velocity to avoid the paradox. This velocity may come in the form of attracting executives from outside the industry with a new perspective, or, an externally driven crises that can galvanize the organization to recognize change (Gersick, 1991).

Work by Chae (2012) proposes that servitization is very similar to biological evolution which occurs at different rates and paces and is highly subject to resources and forces both inside and outside of the firm. The complexity of servitization supports a cautionary approach to entering the services business. At the same time, the success of the US firms in servitizing their business in an industry which is seeing declines due to maturity and disruptive market shifts (Photizo Group, 2013) reinforces the potential value of services as a growth strategy for firms facing mature or disrupted markets. Servitization theory posits that services provide a competitive advantage for manufacturing firms (Kindström, 2010; Gebauer, Gustafsson and Witell, 2011; Lusch and Spohrer, 2012). This would suggest that groups of firms with challenges to servitization (such as Japanese firms in the OP Industry) will increasingly be at a competitive disadvantage, as their competitors shift to a services-led model. This makes it imperative for these firms to understand and address their challenges to servitization.

8. LIMITATION AND RECOMMENDATIONS FOR FURTHER RESEARCH

The primary limitation of the study is that it is confined to the OP Industry, and thus may not be projectable to other industries. However, research linking national culture and organizational culture impacts on the effectiveness of implementing knowledge management tools in Japan, can be a clue that the effects we are seeing in servitization for the OP Industry may have corollary results in other industries. This study proposes an extension to existing theory, which needs to be tested and validated in other industries. Further studies in other industries would provide valuable insight into the robustness and validity of the proposed model.

While the model proposed in this research identifies the impact of national culture on servitization efforts and proposes links to nine specific meso-micro cognitive factors which have values that are unique to national culture, further quantitative research is required to validate these linkages and to determine the relative power of the attributes relative to one another in terms of their influence on the servitization process. Development of measurements scales for the attributes would be a logical and valuable extension to this research.

Since the quantitative stage of this study the OP industry consolidation and maturation has accelerated with many firms in the industry showing significant financial strain (Brewer, 2016; Computer Economics, 2016) despite servitization efforts. This is true of both US and Japanese based firms which would seem to indicate that larger industry dynamics could overwhelm servitization efforts and minimize their beneficial impact. Further research into the financial impact of servitization within the OP Industry would be beneficial in understanding this dynamic. Furthermore, while this research provides a view of servitization at the industry level, further research into how servitization at an industry level may change industry structure (Cusumano, Kahl and Suarez, 2014) would be beneficial.

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Appendix 1: Elite Interview Research Questions

1. Can you provide a description of your firm's journey through the servitization process? Is your firm highly servitized? Or are services an offering that primarily is focused on helping you sell more products?
2. What role do services play in your organization? Are they focused primarily on products and enhancing product sales, or driving outcomes for customers? And if they are driving customer outcomes what types of customer outcomes?
3. What is the biggest driver of your company's servitization? Why is your firm servitizing?
4. If your firm is moving away from services, back to products, what is the biggest driver of this shift?
5. What is your biggest barrier to success? What if anything are the specific issues holding your organization back from reaching your servitization objectives?
6. Were there any key inflection points where your organization gained significant momentum in the servitization process? Or, has there been a point when your organizations focus shifted away from services back to more of a product focus?
7. Historically has your firm delivered products to customers directly via your own sales organization (versus channel partners), through channel partners, or through both? What impact has having a direct sales model or a channel sales model had on the evolution of your service business?
8. What impact has your company's culture had on the development of your service business? Have there been any major advantages or disadvantages in terms of the growth rate of your service business based on this culture? How would you describe your organizational culture in terms of taking risk, engaging in new business areas, and making and implementing strategic decisions?
9. Does your organization have a separate business unit or subsidiary for delivering services with its own management team, its own P&L, and it's different criteria for measuring success relative to your manufacturing business? Or does your organization have one P&L, management team, and successes measurement criteria for both manufacturing and services? In your opinion what has been the effect of this structure on your business?
10. How is this working or not working?
11. How do you gain buy-in from senior management for servitization, or is this driven by senior management?
12. Does your firm's headquarters location have an impact on the development of your service business? Are there unique cultural, economic, or market advantages associated with your firm's headquarters location and the growth of the service business? Why is that?

Appendix 2: Support Tables

Table 28: Percentage of Service Offerings with Customer Outcome Components and Outcomes Results Based on Headquarters Location

	2008	2009	2010	2011	2012	Change
US Vendors: Level of Servitization	16%	23%	30%	34%	39%	+23%
Japanese Vendors: Level of Servitization	5%	8%	9%	10%	11%	+6%
US Vendors: Customer Outcome Centric Service Offerings	38%	35%	37%	56%	54%	+16%
Japanese Vendors: Customer Outcome Centric Service Offerings	37%	34%	36%	57%	54%	+17%
US Vendors: Customer Outcome Focused Results	21%	30%	31%	36%	43%	+12%
Japanese Vendors: Customer Outcome Focused Results	19%	25%	29%	25%	38%	+19%

Source: (Photizo 2012)

Table 29 MPS Agreement Components

<i>Which of the items are included, or will be included, in your MPS agreement?</i>	<i>% of contracts</i>	<i>Ulag & Reinartz</i>	<i>Oliva & Kallenberg</i>	<i>PCA Analysis</i>
Remote monitoring of device for supplies	40%	1. PLCS	2. MS	PCA 1: PFM
Vendor can replace devices that are currently installed	17%	1. PLCS	4. OS	PCA 1: PFM
Monitoring of device utilization	58%	1. PLCS	2. MS	PCA 1: PFM
Reporting of device utilization	49%	1. PLCS	4. OS	PCA 1: PFM
Reporting of device maintenance actions	40%	1. PLCS	4. OS	PCA 1: PFM
Recommendation on device deployment	47%	2.AES	4. OS	PCA 1: PFM
Print policy or guideline	16%	2.AES	4. OS	PCA 1: PFM
Physical survey to identify user needs	14%	2.AES	4. OS	PCA 1: PFM
Assessment of end-user requirements	21%	1. PLCS	4. OS	PCA 1: PFM
Print rules to direct print to specific devices based upon document	12%	2. AES	4. OS	PCA 1: PFM
Change management communication	10%	3. PSS	3.PS	PCA 2: DOCM
Document disposal	15%	4. PDS	4. OS	PCA 2: DOCM
: Document recycling services	15%	4. PDS	4. OS	PCA 2: DOCM
: Document offsite storage	11%	4. PDS	4. OS	PCA 2: DOCM
Assessment of document workflow	22%	3. PSS	3.PS	PCA 3: PDS
Device installation	66%	1. PLCS	1. BIBS	PCA 3: PDS
Help desk services	53%	1. PLCS	1. BIBS	PCA 3: PDS
End user training	51%	1. PLCS	1. BIBS	PCA 3: PDS
Automatic supplies replenishment	48%	1. PLCS	2. MS	PCA 3: PDS
Assessment of device utilization	29%	2. AES	2. MS	PCA 3: PDS
Physically moving device to new locations	36%	1. PLCS	1. BIBS	PCA 4: PSM
Providing 9 hours x 5 day service	29%	1. PLCS	1. BIBS	PCA 4: PSM
Providing 4 hour response time (for service calls)	24%	1. PLCS	1. BIBS	PCA 4: PSM
Manual recording of meter reads	13%	1. PLCS	1. BIBS	PCA 4: PSM
Providing 24 hour x 7 day service	41%	1. PLCS	1. BIBS	PCA 5: CSS
Providing 2 hour response time (for service calls)	31%	1. PLCS	1. BIBS	PCA 5: CSS
Other (please specify)	<1%			PCA 6: PCS
On-site support staff provided by vendor	38%	1. PLCS	4. OS	PCA 6: PCS
Providing same day response time (for service calls)	32%	1. PLCS	1. BIBS	PCA 6: PCS
Assessment of business processes	21%	3. PSS	3.PS	PCA 6: PCS
Environmental sustainability programs	14%	4. PDS	4. OS	PCA 6: PCS
Ulag & Reinartz Definition				Classification
Service to facilitate the customer's access to the suppliers good and to ensure its proper functioning during all stages of the life cycle.				Product Life Cycle Service (PLCS)
Services to achieve productivity gains from assets invested by customers				Asset Efficiency Services (AES)
Services to assist customers in improving their own business processes				Process Support Services (PSS)
Service to perform processes on behalf of the customers				Process Delegation Services (PDS)
Oliva & Kallenberg Definition				Classification
Transaction-based product-oriented services such as transportation, repairs, help desk, product training				1:BIBS (Basic Installed Base Services)
Relationship-based product-oriented services such as preventive maintenance, condition monitoring				2. MS (Maintenance Services)
Transaction-based end-user process-oriented services such as optimization, business consulting, process improvement				3. PS (Professional Services)
Relationship-based end-user process-oriented services such as managing operations, managing maintenance function				4. OS (Operational Services)
PCA Analysis				Classification
Product Fleet Management				PCA1: PFM
Document Outsourcing and Change Management				PCA2: DOCM
Product Deployment and Support				PCA3: PDS
Product Service and Maintenance				PCA4: PSM
Continuous Service Support				PCA5: CSS
Other				PCA6: Other

Developed based upon data from Photizo Decision Maker Tracking Study: (Photizo 2012)

5.0 CONCLUSION

1.0 Discussion and Key Findings

This research explored the servitization of the OP Industry both in terms of the increasing level of servitization and the evolution of the services provided from product-centric to customer outcome-centric services. While servitization of the industry followed similar paths to servitization processes identified at a company level, the research found that one group of firms within the industry appeared to be suffering from a servitization paradox whereby, as a group, their level of servitization (as measured by service revenues (Fang, Palmatier and Steenkamp, 2008)) grew at a much slower rate than the level of servitization for other firms in the industry (Crowley, Burton, and Zolkiewski, 2014a). The two groups of firms were similar in terms of the customers they sell to, the markets they compete in, their service offerings, and the service results they achieved. One clear difference between the two groups of firms was that one group of firms has headquarters in Japan, while the other group has headquarters in North America. Both groups of firms compete in the same markets on a global basis.

Further exploration of the differences between the two groups of firms revealed three levels of servitization factors including industry level (macro), organizational level (meso), and cognitive level (micro-meso) factors affecting servitization. For the Japanese firms, national cultural dynamics appear to exert an inhibiting influence at both the meso and micro-meso level, resulting in unique barriers to servitization. This suggests that national culture impacts servitization at both organizational and cognitive levels (Crowley, E., Burton, J. and Zolkiewski, J. (2018a). This layered approach to servitization factors represents an expansion of theory which may help to explain why strategic change is difficult for organizations. Much of servitization theory is based upon addressing the macro and meso factors which can be more easily identified than micro factors which are difficult to identify and measure (Lenka, Parida, Sjodin et al., 2017). This research posits that the micro layer cognitive factors may be over-looked and as a result, become barriers to servitization.

Using a grounded theory method (Zarif, 2012) to leverage both quantitative grounded theory analysis and qualitative grounded theory analysis can be a powerful research tool to understand these complex dynamics that appear at many different levels (from macro to micro-meso). The quantitative data which provides a longitudinal industry-macro view of change is enhanced by the qualitative research which provides deep insight into deeper meso and micro-meso layers. Individually, either form of research would be lacking in the ability to provide a holistic view of the complex set of dynamics which are

taking place during servitization. Each of these findings is discussed further in the following sections.

1.1 National Culture as a Servitization Factor

While it is seldom addressed in servitization studies, national culture has been identified as a significant factor in many business studies (Crowley, Burton, and Zolkiewski, 2018b). National culture has been identified as a factor in service innovation between Indian firms and Australian organizations which is manifested in differences in new service development systems (Alam, 2010). Japanese firms have been found to have different, and slower decision making processes relative to American firms (Abramson, Keating and Lane, 1996). National culture has also been shown to have a significant influence on how knowledge management occurs at the organizational level (Magnier Watanabe and Senoo, 2010).

Within this doctoral research study, national culture is found to influence both organizational cultural servitization factors and cognitive servitization factors with Japanese and North American firms showing differences in both the factors themselves at an organizational level (organization structure) and the values associated with the factors at a cognitive level (what is valued, tradition, belief in services, risk tolerance, intentionality, perspective to service, desire, change tolerance, and trust). National culture did not seem to influence the industry level factors (customer demand, competitive pressure, staff regulations, or market declines) with both Japanese and North American firms identifying the same industry factors and having the same values for industry factors (Crowley, Burton, and Zolkiewski, 2018b). This is consistent with extant research indicating that industry level dynamics create and shape organizational culture while also presenting a constraint to changing organizational culture (Gordon, 1991) as well as influencing the development of services which ultimately shape industry structure (Cusumano, Kahl and Suarez, 2014), and thus implying that industry factors are consistent for all of the firms within a given industry.

External to servitization research, national culture factors have been linked to cognitive factors such as the impact of national cultural value of trust and its impact on cognitive processes including individualist economic calculations, expectations or predictions of others behaviours, intentionality, capabilities, and transference of trust to others (Doney, Cannon and Mullen, 1998). Hofstede (1985, 2011) identified differences in national value systems based on power distance, uncertainty avoidance, individualism, masculinity, power distance, and long term orientation. Further research by van Oudenhoven (2001) supported the influence of national culture on organizations. The linkages and impact

of national culture on both organizational cultural servitization factors and cognitive servitization factors will be discussed further in the following sections addressing organization and cognitive factors respectively.

1.2 Industry Level MPS Dynamics and Factors

The initial goal for this research was to study servitization at an industry level for the OP industry. The OP Industry has been identified as a leader in the adoption of servitization due to the long history of providing products as services, as exemplified by Xerox's original model of selling 'pages' versus copiers beginning in the late 1950's (Visintin, 2014). Within the industry the common term for pay-for-use services is Managed Print Services (MPS) (Matsumoto and Kamigaki, 2013). By studying the buyers of these MPS services, using the QGT approach, three key industry dynamics related to the servitization of the OP industry were uncovered including:

1. Increasing servitization for OP industry manufacturers as measured by the level of service revenue relative to their total industry revenues. This measure of servitization (Fang, Palmatier and Steenkamp, 2008) is used in this study as a measurement of the level of servitization for the industry and for individual firms.
2. Not all firms realized the same levels of services revenue growth, although, all firms did grow services revenue.
3. An evolution of service offerings from product-centric services to more services focused on customer-outcomes and advanced solutions such as document workflow solutions, document recycling, and change management communication. (Crowley, Burton and Zolkiewskie, 2014a).

Offering both product-centric and customer outcome-centric services is consistent with the need to address a range of customer's needs (Visintin, 2012). This research does not support the hypothesis that product smoothing services (such as financing or training which are 'loosely' coupled with the product) tend to grow as the industry matures, with only a modest increase in substituting services (such as replacing the purchase of a product with an outcome-based model where the customer pays for the use of the product) (Cusumano, Kahl and Suarez, 2014). Rather it indicates that as the OP Industry has matured, and services have evolved, there has been a significant shift in the mix of services offered from product-centric (smoothing) services to customer-outcome (substituting services) offerings with product centric offerings growing modestly from 49% to 59%, while customer-centric offerings more than doubled from 19% to 40% (Crowley, Burton and

Zolkiewskie, 2014a). This finding validates research of the OP Industry which identified an evolution from product centric services to customer outcome centric services (Matsumoto and Kamigaki, 2013), and answers a call for a longitudinal study of the evolution of service offerings in the industry (Rapaccini and Visintin, 2014).

While the QGT stage of the study provided insights into key industry level dynamics in terms of both the level of services growth and the mix of services being offered, the second stage of qualitative research provided further insight into some of the commonly held assumptions within the industry. Industry level assumptions are important as they create ‘paradigms’ for how organizations can operate, in addition to, in some cases providing regulatory guidelines for operations in industries such as utilities (Gordon, 1991). The factors which respondents identified during the interviews can be viewed as their assumptions for the industry (Gordon, 1991). Common industry level factors identified by the respondents included customer demand, competitive pressure, regulations and market declines:

Customer Demand: Respondents identified the demand from customers to shift their buying model from purchasing products to purchasing services delivered via the products as evidenced by this quote:

“That is what they are looking for. They want to buy that as a service. They do not want to buy the boxes or going back to a product discussion. They want to get rid of that.” (Company C Sales VP)

Competitive Pressure: Competitors shifting their focus to services was a clear driver of servitization for several firms. According to the Channel Executive in Organization D, “...and then you have (Organization C). (Organization C) was one of the key drivers because they were focusing their whole business on services.” Furthermore, the indirect competitive pressure was evident as general customer purchasing expectations were influenced by trends for other product categories such as the following quote:

“We have to follow this trend, otherwise we cannot satisfy the customer like you know cloud based services and utility based services.” (Company B GM MPS)

Regulations (Impacting Staff) In the effort to enhance staff skill sets through staff replacement, regulatory limitations were cited as a concern.

“Except the reality is, is that it is actually not that easy to change your workforce, right? There are a lot of, you know, social and legal restrictions that are very enormous on a business of our size.” (Organization B Marketing Director)

Market Declines One of the most frequently cited factors in servitization at the industry level was the consensus on declines in the size of the OP industry. Services were cited as a way to secure existing revenues by converting transactional product purchases to recurring contractual revenue streams.

“So due to this trend, we are forced to look for the new business stream. That is one of the main reasons why our industry, not only (Company B) but I think also most of the vendors shifting to increase more services business instead of just staying in the box and then expecting the document volume.” (Company B GM MPS)

While the impact of servitization at an industry level on the survivability of firms within specific industries is unclear (Cusumano, Kahl and Suarez, 2014), the factors described by respondents were consistent across all organizations which indicates a recognition of broader industry dynamics as factors in propelling firms to servitize their business within the OP industry. Based upon this research these factors appear to operate at a macro level largely irrespective of the national culture while playing a large role in shaping the organizational culture (Crowley, Burton and Zolkiewskie, 2018b).

1.3 Organizational Culture Factors

Organizational culture is highly impacted by the industry norms and dynamics (Gordon, 1991; Calantone, Di Benedetto and Song, 2010). As a result, it is not surprising that most of the organizational culture servitization factors were consistent across all companies. Skill sets, path to market, change in leadership, technology enablement, financial position, investment, and business model were all identified as servitization factors by both North American and Japanese firms. An exception is the organization structure. Organizational structure was unique in that North American firms and Japanese firms have distinctly different decision-making structures. As a result of their top-down decision-making approach, North American headquartered firms do not provide the level of autonomy in decision making that Japanese firms provide to individual operating companies which are, for Japanese firms, regionally based.

“Basically, because every country was trying to formulating their own services strategy based on their internal cultures.” (Organization D, Japanese - Channel Executive)

This decentralized operations structure for Japanese firms can be a barrier due to the length of time associated with decentralized decision making as demonstrated by the following quotes:

“So you know, the amount of questions that are coming you know, from Japan, again all good questions but it’s speed.” (Organization F, Japanese - Senior VP)

“So, that means that actually that's quite a, that's a slow process. That's a drag, definitely a pull on the boat because guys who've grown up are slow to change” (Organization B, Japanese – Marketing Manager)

“It took certain time in case of the Japanese firm but I think more American who have more stronger leadership companies, US companies or global companies, I think the speed could be faster than the Japanese in general..” (Organization B Japanese - GM MPS)

The speed of decision making, organizational alignment, and reaching critical mass were identified by multiple organizations as critical to servitization success.

“The company is a collection of individuals and it goes back to the top. If you do not have that vision and alignment at the top level, you’re in trouble.” (Organization C American - VP Sales)

“The North American organizations focused on critical mass and we are less constrained and more focused and experimenting constantly and I think that is more conducive to services mindset than a hardware mindset. Critical mass in the services business that it could demonstrate its value and scale that we seem to find the tipping point.” (Organization A, American - Executive VP)

The organizational structure dynamic is significantly different for American versus Japanese firms and while it is identified as a single factor within the proposed model, there are multiple manifestations of the organizational structure dynamic during the interviews such as the influence of the central R&D organization in Japanese firms.

“When we think about servitization and customer centric, sometimes we have to accept what the customer wants and incorporate technology available in the market and sometimes we have to incorporate multi-vendor environment and so on, but the central gravity in R&D does not allow that, with or without their awareness.” (Organization F, Japanese - Executive VP/GM)

Organizational culture can be both an inhibitor and enabler of servitization based upon respectively the role of culture as a promoter of path dependence inhibiting servitization and the role of culture as an enabler when used by agents to promote path creation thus enabling servitization (Lienert, 2015). Drawing upon the linkage of industry to organization culture, which is a lower level or meso layer, an argument can be made that

if the organizational culture is shifting towards higher levels of servitization then the organizations within the industry should also be shifting to higher levels of servitization based upon industry competitive dynamics. However, if this is true, then how can one explain the impact of national culture on inhibiting servitization at the organizational level?

The answer to this question may reside in the definition of organization culture. *“Organizational culture is the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems and external adaption and internal adaptation... and , therefore, to be taught to new members as the correct way to perceive, think and feel in relation to these problems.”* (Schein, 1984, p. 3) This definition links culture to an individual level of cognition as the ‘group’ paradigms are transferred to the individual and their cognitive approach to problem solving. Given the tie of the industry level factor (macro) to the organizational cultural factor (meso), the influence of national culture on the cognitive decision-making dynamics may provide the explanation of this phenomenon.

In essence, organizational culture appears to be simultaneously influenced by macro-industry pressure encouraging servitization and the impact of national culture on the individual cognition of organization members which can create a dissonance in servitization intent, and thereby create a barrier to servitization (Crowley, Burton and Zolkiewski, 2018a, 2018b). With the importance of corporate culture to servitization (Weeks, 2010; Alghisi and Saccani, 2015a), and the difficulty in changing corporate culture from being product-centric to services centric (Dubruc, Peillon and Farah, 2014), understanding what role cognition may play in developing organizational culture to support servitization is critical.

1.4 Cognitive Dynamics

Managerial cognitive ability has been identified as a foundation for developing integrated product service systems sensing, seizing, and reconfiguring capabilities (Wilkens, Lienert and Elfving, 2016). Stubbart (1989) argues that the classic economics view of managerial cognition where all managers share a common, utility based rational cognitive framework for decision making is inaccurate. His research is supported by findings from this doctoral research in that these findings suggest cognition within the organization can be influenced by national culture. While national culture may be only one of the dynamics influencing cognition (for instance, executive longevity within an industry has been proposed as a significant influence in management paradigms and cognition (Gersick, 1991)), in this study it was the one influence on cognition that could be clearly identified based upon the contrast between Japanese and North American firms.

Nine of the twelve cognitive factors which are discussed in depth in the third article (Crowley, Burton and Zolkiewski, 2018a) have significant differences between Japanese and North American firms. By comparing these cognitive factors to associated national culture attribute values defined in the Hofstede model (Hofstede, 1985) relationships between the attributes and their impact on cognitive servitization factors can be identified as shown in Table 30.

Table 30 - Cognitive Factors Affected by National Culture

Cognitive Factor	Hofstede Model	American Value	Japanese Value	Servitization Impact
What is valued	Individualism vs. Collectivism	Individual	Collectivist	Collectivist values may make it more difficult for service 'leaders' to drive change due to the necessity to reach consensus as part of the change process.
Tradition	Indulgence Versus Restraint	Indulgence	Restraint	A high restraint value can create organizational resistance service adoption since this could conflict with the traditional values of being a manufacturing firm.
Belief in Services	Masculinity versus Femininity	Higher Feminine	Higher Masculine	Higher Feminine associated with higher value for service
Risk Tolerance	Uncertainty Avoidance Index	Low Avoidance	High Avoidance	Aversion to risk may reduce willingness to change
Intentionality	Power Distance Index	Higher Power Distance	Lower Power Distance	Alignment of intent in Japan may be more difficult due to requirement for high level of consensus as power (including decision making) is more evenly distributed through the organization – indicating a higher need for 'buy-in' to servitization intentionality.
Perspective towards Service	Masculinity versus Femininity	Higher Feminine	Higher Masculine	Higher Feminine associated with higher value for service
Desire	Indulgence vs. Restraint	High Indulgence	High Restraint	High restraint may make it more difficult for service leaders or visionaries to gain traction in a high restraint organization since the high restraint values will make it more difficult for individuals to innovate outside of the existing manufacturing culture.
Change Tolerance	Long Term Orientation	Normative (short-term)	Pragmatic (long-term)	Higher tolerance change may accelerate servitization since it implies a willingness to adapt to new ideas and try the new approaches associated with servitization.
Trust	Uncertainty Avoidance Index	Low Avoidance	High Avoidance	Change requires trust in the potential benefit associated with the change. However, change also involves uncertainty and risk. A low level of trust makes it difficult to embrace the change associated with servitization in a high avoidance value based organization.

Interestingly, the differences in cognitive traits between the groups is consistent regardless of the nationality of the individuals within each group. For example, the European and non-Japanese individuals in Japanese firms identified the same cognitive challenges as Japanese individuals in the same firm. However, cognitive constraints such as collective decision-making being valued, were often described as an organizational versus an individual trait as demonstrated by the following quote by a European manager in a Japanese organization:

“At the same time, because I’m in a Japanese organization I need true consensus to build the team that are going to come with me on this journey.”
(Organization B Japanese - Marketing Director Europe – Who is of European Nationality)

This dynamic suggests that the individual cognition is moderated by organizational culture, and the influence of national culture is impacting both organizational culture and individual cognition (Crowley, Burton, and Zolkiewski, 2018b). Within the design of this study it is difficult to ascertain which relationships have the greater influence on individual cognition; the culture of the organization on individual cognition, or the aspects of national culture as represented by their influence on organizational culture and the subsequent influence of these organizational culture elements on individual cognition. Understanding this dynamic represents an interesting area for potential future study.

Regardless of whether the national culture influence is directly on cognition, or on cognition indirectly through organizational culture, the end result is an impact on servitization. For example, the impact of cognition on the servitization process can be seen in impact of decision-making speed on the speed at which firms are able to servitize. Both a lower tolerance for change and a higher value on collectivistic decision making appear to slow down the Japanese decision-making process (Crowley, Burton, and Zolkiewski, 2018a). This is validated by research from Abramson et al (1996) using cognitive schema and cognitive maps found that Japanese decision making is fundamentally different and takes longer than North American decision making. It is further validated by research showing a core value of Japanese society is ‘fitting in’ with society through harmonious relations which results in a strong consensus driven culture which represents a barrier to achieving strategic change (Karube *et al.*, 2009) such as servitization. Nadkarni & Barr (2008) argue that research creates an artificial boundary between the economic view of strategic action being driven by industry structure versus the cognitive view which views strategic action as being driven by managerial cognition. This doctoral research posits that

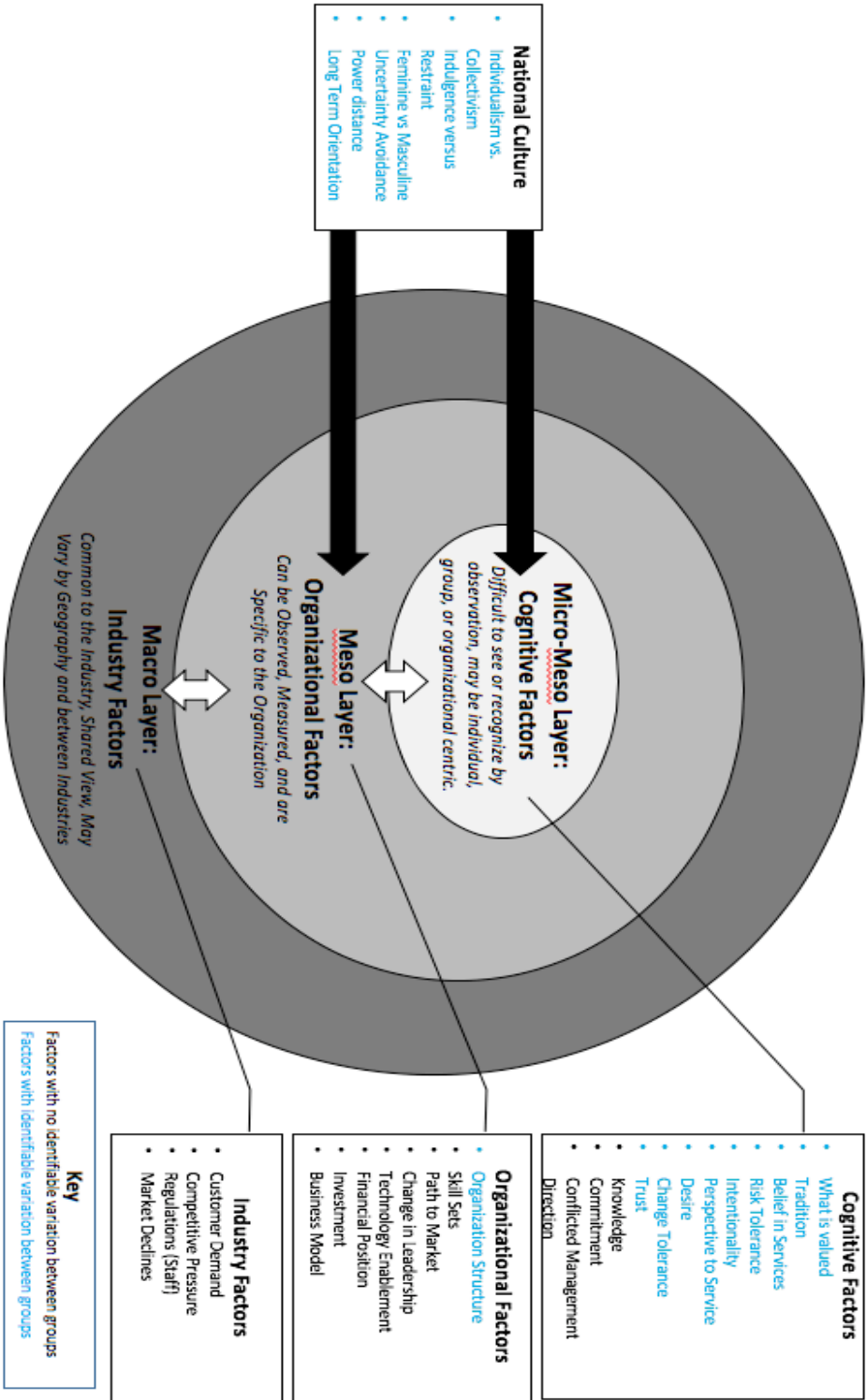
an additional view needs to be addressed in this discussion, which is the cultural view of national culture being an impediment to the strategic action to servitize the business.

Based upon this research, a model is proposed for the ‘layers’ of the factors affecting servitization beginning with the micro layer of cognitive factors. At the lowest level individual cognition is influenced by the higher layers of organizational factors at the meso layer level, and industry factors at the macro level. National culture directly influences the cognitive micro-meso layer and the organizational meso layer. Simultaneously, there is interaction between the industry macro layer and the organizational meso layer with the organizational layer both influencing the industry layer and being influenced by the industry layer. Likewise, the individual micro-meso cognitive layer is influenced by, and also influences, the organizational layer (Crowley, Burton, Zolkiewski, 2018b). The next section will discuss this model set out in Figure 7.

1.5 Layered Servitization Model

Based upon this research a model for layers of servitization and the impact of national culture on these layers emerges and is represented in Figure 8. In examining the layers of servitization, the differences based on headquarters location increase as the focal point shifts from macro (industry) to micro (organizational) and even further to individual (cognitive) levels. The layers of the model are permeable, as in the case of cognition factors and organizational factors, where the cognitions co-evolve with the environment where “*The process includes both shaping the surrounding world and being shaped.*” (Wilkens, Lienert and Elfving, 2016, p. 496).

Figure 8 - Layered Servitization



National culture influences both the micro-meso layer and the meso layer of servitization factors. This is supported by research indicating national culture is an important factor in management decision making (Bhaskaran and Sukumaran, 2007) and organizational initiatives (Tata and Prasad, 2015). Work by Fayolle, Basso and Bouchard (2010) identifies a model for the firm's entrepreneurial orientation which is influenced by national culture, industry culture, and corporate culture, however, within the context of their model the effect of national culture is mitigated by the industry and corporate culture, resulting in national culture having an indirect effect on entrepreneurial orientation. My research posits that, within the OP Industry, the national culture has greater effects on cognitive factors relevant to servitization than either the organizational or industry culture (Crowley, Burton, and Zolkiewski, 2018b).

1.6 Japanese Firms Suffer from the Servitization paradox

This research also posits that as a result of the influence of national culture factors on the meso and micro layer of servitization factors for Japanese firms, the Japanese firms are failing to realize the same level of servitization revenue as American firms, despite offering similar services and achieving similar service outcomes with these services (Crowley, Burton, and Zolkiewski, 2018a). In the interviews with the Japanese firms, growing service revenue was articulated as an objective of servitization by the Marketing Director in Organization B: *"...the relative percentages of businesses which generate service versus hardware revenues, that is where the more successful business is."* Another example is from a press release by Ricoh in 2011 announcing an investment of \$300 million (USD) in services infrastructure in order to achieve a revenue target for services of \$3.3 billion (USD) by 2013 (Ricoch, 2011). While increased service revenue is stated as the desired outcome by Japanese firms, the firms are failing to achieve targeted levels of revenue as shown by the following quote:

"That is because despite our efforts we have not really been successful to be honest in developing proper MPS engagement." (Organization D – GM Marketing)

This desire for increased levels of service revenue (Crowley, Burton, and Zolkiewski, 2018a), with an accompanying investment in services infrastructure to achieve this revenue, without realizing desired levels of revenue (Crowley, Burton, and Zolkiewski, 2014a), is consistent with the definition of the servitization paradox (Benedetinni and Neely, 2010). The servitization paradox is a significant issue for Japanese firms in the OP industry for several reasons. First, by investing in servitization and failing to realize revenue growth

from this investment, Japanese firms may actually be increasing their risk (Benedettini and Neely, 2010; Benedettini *et al.*, 2010) and potentially generating negative financial impact (Kastalli and Van Looy, 2013). Given the shrinking revenues and increased consolidation in the OP Industry (Lecompte, 2013), failed servitization attempts may put a level of financial stress on Japanese OP industry firms that threatens their long term viability. Secondly, it identifies that other, national cultural factors, may be barriers to servitization and unless these factors are recognized and addressed they may preclude Japanese OP Industry firms from achieving their desired results from servitization (Crowley, Burton, and Zolkiewski, 2018b).

This research contradicts findings in recent research which posits that advanced services may be the key to financial performance for firms attempting to overcome the servitization paradox (Sousa and da Silveira, 2017) since the Japanese firms in the OP Industry are offering the same advanced services (represented in this study as customer centric services) as American firms, but not seeing the same financial performance results (as measured by levels of service revenues) (Crowley, Burton, and Zolkiewski, 2014b).

2.0 Contributions

This research makes five main contributions to the understanding of servitization. The first is identifying the impact of national culture on servitization factors. The second contribution is the layered model for servitization factors encompassing macro (industry), meso (organizational), and micro (cognitive) factors. The third contribution is the use of industry level research and analysis to isolate organizational and cognitive servitization factors by removing industry dynamics as a factor. A fourth important contribution is demonstrating the use of a mixed methods approach based upon a grounded theory method with both quantitative grounded theory analysis (which is largely under-utilized) and qualitative grounded theory analysis, in order to fully understand the complex phenomenon of industry level servitization. The fifth contribution is the use of services customer data to explore the customer perspective on servitization, compared to the more frequently used approach of using vendor reported data. Each of these contributions is explored further in the following sections.

2.1 Identifying the Impact of National Culture:

Despite the number of studies pointing to the impact of national culture on the organization, the link between national culture and servitization has largely been ignored outside of a few studies addressing offshoring services (Metters, 2008), Japanese national culture being a barrier to servitization for Japanese manufacturers (Toya *et al.*, 2016), the

difference between new service development in Indian and Australian firms (Alam, 2010), and the cultural differences representing a challenge to servitization in Chinese versus Nordic firms (Bao and Toivonen, 2015). This research expands upon existing servitization theory by raising national culture as a potentially significant influence on servitization at the individual cognitive level, which in turn, may impact the ability of the organization to transform through servitization and respond to industry level pressures or factors.

2.2 Three layered model for servitization factors:

A key contribution of this study is to provide a three-layer model for servitization which transcends the historical focus on organizational issues to include cognitive factors as important elements in servitization. This model provides a holistic view of the factors impacting servitization efforts and the interaction that the different layers of servitization have upon each other. This study answers call for more research to understand the linkages between industry and organizational culture (Christensen and Gordon, 1999). By finding that Japanese firms are less successful in achieving the same servitization levels as North American firms, this research also addresses calls for the measurement of the impact of cognitive factors and decision making on outcomes (Abramson, Keating and Lane, 1996).

2.3 Industry Level Research Isolating Cognitive Servitization Factors:

Recent work by Fayolle, Basso and Bouchard (2010) identifies a model for the firm's entrepreneurial orientation which is influenced by national culture, industry culture, and corporate culture, however, the effect of national culture is mitigated by the industry and corporate culture, resulting in national culture having an indirect effect on entrepreneurial orientation. My research concludes that, within the OP Industry, national culture has the greatest impact on organizational and cognitive servitization factors, with significantly less impact on industry level servitization factors (Crowley, Burton, and Zolkiewski, 2018a). This finding may be an unanticipated benefit of studying servitization at the industry level since it allows the isolation of cognitive factors which may be masked or lost when examining servitization at the individual firm level or the cross-industry level.

2.4 Mixed Methods, Grounded Theory Design Research:

By utilizing a grounded theory approach, this research was able to combine both quantitative survey data and qualitative interviews to identify the impact of eleven cognitive factors on servitization efforts by firms in the OP Industry. Furthermore, the research was able to identify how nine of these cognitive factors were influenced by the national culture of the organizations headquarter location. These findings point to the importance of understanding the influence that both national culture and cognitive factors have in the

servitization process. Furthermore, it expands existing theory by positing that national culture influences cognitive factors that can be inhibitors or enablers to the servitization process. This also demonstrates the value of utilizing data from practitioners in academic research.

2.5 Using Services' Customers Data

Unlike existing studies which rely upon self-reporting by the manufacturer or vendor to assess the services offered, this research utilized in stage 1 results from a longitudinal quantitative study (MPS Decision Maker Tracking Study (Photizo Group, 2012)) of service customers to assess the offerings provided by manufacturers and vendors. This provides a unique assessment of servitization from the customer perspective, something which is lacking in most research into servitization.

3.0 Implications for Practitioners

Practitioners are looking for academia to provide insight into the paths for organizational transformation associated with servitization, and specifically, prescriptive insights (Bustinza, Vendrell-Herrero and Baines, 2017). Servitization research has evolved from a view of a smooth linear transformation from product-centric business to a service-centric business (Oliva and Kallenberg, 2003; Baines, Lightfoot and Smart, 2011) to today's more nuanced view with multiple paths to servitization and the potential for de-servitization (Kowalkowski *et al.*, 2017). Current research proposes multiple models for representing servitization transformation from end-state to gradual transition and stepwise progression (Brax and Visintin, 2017). Views of servitization have expanded from just a transformation to a reinforcement mechanism for existing product centric business models (Salonen, Saglam and Hacklin, 2017b). This evolution of servitization research is indicative of academia's growing insight into the complex and multidimensional process of servitization. Concurrent with this increase in academic knowledge is the increasing recognition among manufacturers that competitive advantage (Eloranta and Turunen, 2015) and financial gains (Gebauer, Haldimann and Saul, 2017) may not be realized from servitization (Neely, 2009; Lee, Yoo and Kim, 2016). At the same time, enabling technologies such as remote monitoring (Grubic, 2014a), the success of some manufacturers in creating service based businesses such as Rolls Royce and their "power by the Hour" concept in jet engines, (Smith, 2013), and the integration and digitization of supply chains (Vendrell-Herrero *et al.*, 2017) create a compelling force for manufacturers to consider servitization despite the path to servitization being uncertain with many unknowns (Kohtamäki, M. & Helo, 2015). This

doctoral research has multiple implications for practitioners as they pursue a servitization journey.

The first implication for practitioners is that it is important to understand what national cultural norms or values may be impacting the organizations path to servitization. Specifically, does the organization have cognitive paradigms that have been influenced by national culture which may represent a barrier to servitization such as:

- Valuing consensus to the point of slowing the decision making related to servitization and thus creating a barrier to organization transformation?
- Lacking a belief in the value of services due to a strong preference for products?
- Holding a low risk tolerance and viewing services as a high-risk strategy?
- Lacking a desire to shift to a services-led model, perhaps due to a high desire to remain focused on manufacturing?

In order to gain an understanding of the organization's cognitive views, executives should consider conducting a survey, in-depth interviews, or some other form of survey methodology to understand the organizations collective 'cognitive' view of services. One respondent spoke of the efforts by product-centric management teams to undermine the servitization efforts in their firm in order to retain their manufacturing focus. Without an objective assessment of the organization's collective cognition, executives may mistakenly assume their desire to servitize the company (servitization intent) is shared by the entire organization (Crowley, Burton, and Zolkiewski, 2018a). However, this may just result in a dissonance in the servitization intent for the organization if the employees do not share this intent. Understanding the cognitive views of the employees, and developing change management plans to overcome potential areas of resistance may be a critical element in servitization planning.

For Japanese firms, a key challenge will be understanding how the nine cognitive servitization factors which are influenced by national culture (what is valued, tradition, belief in services, risk tolerance, intentionality, perspective of service, desire, change tolerance, and trust) may impact their servitization efforts. Active change management programs may be required to effectively shift the cognitive factors and gain alignment around the executives' intent to servitize the company. In order to achieve growth in service revenue levels, Japanese executives may need to build buy-in among the organization and provide education and training programs to gain personal buy-in to the concept of services outside of the executive ranks. Additionally, in order to change the culture, radical change such as bringing in new top executives, from outside the industry, may be required to craft

a services centric vision beyond the existing manufacturing vision. Japanese boards typically have significant influence on executive decision making and as such, board level buy-in will also be a critical element.

Japanese firms have unique culture which believes in the value of *omotenashi* which is a 'heartfelt' level of service extending beyond what the customer has paid for (Belal, Shirahada and Kosaka, 2013). There is tremendous value in this concept in that it drives exceptional levels of high-quality service. However, it makes bounding the service engagement and receiving full value for the services paid difficult, in fact, the *omotenashi* concept of delivering more than what is expected or paid for is diametrically opposite of the concept of bounding service and achieving full value for services rendered. By bounding services to capture full value, but keeping the concept of exceptional service delivery, Japanese firms have the potential to create a competitive advantage around their service offerings.

For both Japanese and non-Japanese executives, this study reinforces the complexity of servitization, and calls for executives to encompass not only the organizational dynamics in servitization planning such as staff skills, service offerings, business model structure, and other previously identified components of the servitization transformation, but to also account for the interplay of culture and cognition as potential enablers and or barriers to servitization. Dealing with cognitive concepts or issues are often ignored since they are seen as more of the purview of psychology than business but executives would be well served by exploring concepts of managerial psychology such as the concept of presence as the missing link in action between planning and control (Riva *et al.*, 2011), or attention in the role of both formulating and executing the servitization strategy (Gebauer, 2009), and even the impact of difference influence strategies based on the existing individual beliefs within the organization (Fu *et al.*, 2015). In order to effectively navigate change in these cognitive areas executives will need to develop new skills and sensitivities to the psychological and motivational methods for shifting the culture and cognition of the organization as part of the servitization process.

4.0 Limitations and Suggestions for Future Research

Whilst this research used unique methods and produced multiple contributions in the process of extending servitization theory, the study did have limitations which are addressed in the following sections.

4.1 Limitations

This research was conducted during a time of rapid servitization and significant focus by all major firms within the OP Industry on servitization. However, in the subsequent years, consistent with current servitization research (Kowalkowski, Gebauer and Oliva, 2017), while some manufacturers have continued the servitization of their business, others have actually gone through a period of reverse servitization (Finne, Brax and Holmström, 2013) with some firms shifting back to a product centric focus. As such, the research is bounded by the timeframe in which it was conducted, and subsequent analysis of the reasons for failure of servitization may provide significant additional insight into the factors influencing the reverse servitization of some firms in the industry.

The scope of this research was limited to quantitative analysis of customer survey data and in-depth interviews with executives. By conducting in-depth interviews with customers in addition to expanding interviews in the manufacturing firms to non-executives, new insights may be obtained into the servitization factors addressed in this research.

The research does not provide a measurement scale for assessing the cognitive aspects of servitization. Research to develop and validate measurements scales for cognition factors in servitization would be extremely valuable to practitioners in order to provide a gauge and benchmark for setting targets and measuring progress in moving these cognitive factors.

Because this research focuses upon a single industry it may not address factors related to dissonance in servitization intent that may be present in other industries. Further research is needed to understand the dynamics associated with servitization intent. A critical area for future research is developing methods to measure servitize intent through the organization in order to be able to quantify the level of dissonance and subsequently to take appropriate actions to create unified servitization intent.

It is important to note that Japanese firms are not homogeneous in nature, as within any national culture there are variations and differences. Japanese firms have different profiles, ranging from adhocracies which have stronger entrepreneurship and adaptability characteristics, to 'clans' which focus more on cohesiveness, participation, teamwork, and sense of family, versus hierarchy which focus on rules and regulations, and finally, market centric which are focused on competitiveness and goal achievement. This study did not differentiate between individual firms, and as such, further insights may be gained by examining Japanese companies in the OP Industry to determine whether the national culture

impact may vary within individual firms, thus potentially providing additional insight into the impact of organizational factors which would expand upon the results of this study.

A further limitation of this research is that the level of internationalism may vary between firms within the OP industry, however, this was not measured in this research and as such may be an additional factor which could impact servitization factors at the organizational or even cognitive level. Furthermore, the study did not analyse the composition of the executive or employee level staff in terms of nationality within these firms to determine if this could be another dynamic impacting servitization factors for these firms.

4.2 Future Research

Resistance to organizational change was indirectly identified as one of the barriers to servitization within this doctoral research by multiple respondents. Additional research has identified the influence of employee motivation factors on product service systems (PSS) (Kreye, 2016). The findings of this doctoral study support the need to conduct further research to identify the linkages between individual personality traits, motivation, and the cognitive resistance to servitization by individuals, and furthermore, how this cognitive resistance to servitization by individuals impacts the context for the organization as a whole. The dissonance identified in servitization intent could be anticipated to have a high correlation to this cognitive resistance at an individual level.

Expansion of the in-depth interviews into all the actors such as non-executive employees and customers within the service network would increase our understanding of the cognitive servitization factors. In addition, other actors in the servitization ecosystem such as resellers who provide service contracts, providers of key services technology infrastructure such as fleet management software vendors, and supporting actors such as vendors who finance fleet outsourcing activities could provide valuable insight into servitization factors and how they impact the interplay between network actors in the industry.

While the Hofstede's (1985) seminal work on the influence of national culture on corporate culture established the importance of understanding national culture, national cultures may not be static and they may evolve over time and our understanding of them may evolve over time (Lehmberg, Dhanaraj and Funai, 2013). This was the case with Hofstede's original model which evolved from four dimensions to six indicating the expanding conceptualization of national culture characteristics (Hofstede, 2011). The complexity of national culture provides a rich field for future research. By linking national

culture to cognizant factors associated with servitization, this research invites further exploration of how these factors may be quantified and their role in other industries.

Research has cited the potential impact of pay per use services on market growth and market share expansion in mature product markets (Gebauer, Haldimann and Saul, 2017). Data from the quantitative survey utilized in the first stage of this research contains information on the types of services offered. By combining this survey data with secondary data for which firms are offering pay for use services and their respective market shares, it would be possible to quantitatively validate whether firms offering pay for use services achieved market share gains, thereby validating or challenging the findings of a priori research. This study highlights the value of using existing data, QGT, and industry level analysis to explore and expand existing theoretical constructs related to servitization. Given the availability of data for the OP industry, this can be a rich field for additional research.

Finally, this study utilized purposeful sampling of firms within the industry with a limited number of interviews per firm. Conducting in-depth case study research into both Japanese and North American organizations to further understand the dynamics and drivers of the nine cognitive factors using larger samples of individual interviews would be extremely beneficial and may unearth additional cognitive or organizational factors which are relevant to this work.

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