The Hidden Barriers to Servitization: Examining National Culture and its Effect on Business Culture and the Servitization Process

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Introduction

The aim of servitization is based upon increasing customer value through the combination of products and services bundles (Vandermerwe & Rada 1988). While servitization has the potential to improve a business-to-business manufacturing firm's valuation (Fang et al. 2008) and competitive position (Gebauer et al. 2011; Bharadwaj et al. 1993; Baines et al. 2011) through increasing the value delivered to end-customers (Luo et al. 2012; Grönroos & Ravald 2011) and by enabling manufacturers to serve increasingly complex customer needs (Lusch & Spohrer 2012), many manufacturers struggle to achieve these results (Andy Neely 2009).

A number of factors have been identified which impact the success of servitization efforts including have the right business model elements to drive service innovation (Kindström & Kowalkowski, 2014), having the right capabilities to provide advanced services (Raddats, Burton, Zolkiewskie, Story, & Baines, 2014), having the operational capabilities to deliver services (Visnjic & Van Looy, 2013), being able to create new managerial paradigms and service business models (Barnett, Parry, Saad, Newnes, & Goh, 2013) and building a service centric culture (Dubruc, Peillon, & Farah, 2014).

Servitization research has historically has focused on organizational, versus national culture. However, existing research provides many indications that the firm's national culture can impact the firm in many ways. For instance, a firm's national culture and values can have significant impact on how firms develop trust (Doney, Cannon, & Mullen, 1998), it also influences the adoption of organization routines (Massini, Lewin, Numagami, & Pettigrew, 2002), and can impact the organization's ability to implement strategic initiatives (Karube et al., 2009).

National culture can also impact corporate culture. Hofstede's (1985) frame work consisting of four dimensions (power distance, uncertainty avoidance, individualism, and masculinity) provides a perspective for how national culture and value system can influence corporate culture and value systems. Corporate culture is important and has significant implications for the firms' activities and initiatives. For example, corporate culture has been identified as having greater impact on corporate employee outcomes than employee demographics, their cognitive ability or their personalities (Taras, Steel, & Kirkman, 2011). Organizational culture has also been linked to the effectiveness of manufacturing strategy (Bates, Amundson, Schroeder, & Morris, 1995), it has been identified as an important area for research in marketing (Deshpande & Webster, 1989), and as a key factor affecting the success of business model innovation efforts (Bock, Opsahl, George, & Gann, 2011). Finally, corporate culture has also been identified as as a critical element in servitization (Weeks, 2010).

Despite the identification of national cultures impact upon corporate culture, and the impact of corporate cultures impact upon the success of servitization efforts, current servitization research does not identify national culture as a factor in servitization efforts. By exploring the results of a multi-mode grounded theory based research project using both quantitative and qualitative data gathering, this research examines potential linkages between national culture, corporate culture, and servitization outcomes. The research focuses upon an industry (the Office Products or OP Industry) which is dominated by firms from North America and Japan (Photizo, 2013). Firms within the OP industry compete with each other on a global basis (Hutchins & Huster, 2010) providing an opportunity to contrast the dynamics of servitization and culture between firms from two countries which have distinctly different national and business cultures (Hofstede, 1985).

The remainder of the paper is structured as follows. It begins with an overview of servitization theory and the context of the study. This is followed by a discussion of the research questions, and research methodology used. Next, each phase of the research is described including the key findings from this research. Consistent with the grounded theory approach, the research findings are closely integrated into extant research, showing similarities and new avenues for study. Finally, implications and limitations of the research are also discussed.

Research context

Servitization framework

Within the context of this research, the concept of servitization is defined as the process of combining services with products to create value bundles (Vandermerwe & Rada 1988). The process of servitization will be examined in an industrial setting with manufacturers who are providing business-to-business (B2B) services. For manufacturers, the servitization process can include the transformation of a firm's strategy (Raddats & Burton 2011; Gaiardelli et al. 2014), business model (Teece 2010; Visnjic & van Looy 2013; Paiola et al. 2012; Gaiardelli et al. 2014), offerings (Kindström & Kowalkowski 2009 Ulaga & Reinartz 2011), culture (Ahamed, Kamoshida, et al. 2013b), and operational capabilities (Visnjic & van Looy 2013; Miozzo & Grimshaw 2011; Storbacka 2011).

In addition to being a concern for individual manufacturing firms, servitization is also an issue at the industry level. Gebauer (2011) argues that firms can actually use services as a way to change industry structure, as evidenced by IBM and GE, however, there is limited literature examining servitization at an industry level (Turunen & Finne 2013). Several researchers have indicated the need for this type of research to guide industrial and government policy on servitization (Lin et al. 2011; Nirupam Bajpai 1999).

While a complete review of the barriers to servitization is beyond the scope of this paper, common barriers associated with servitization include organizational (Ahamed, Kamoshida, & Inohara, 2013), financial (Visnjic et al., 2014), customer (Ahamed, Kamoshida, et al., 2013), and cultural (Hou & Neely, 2013; Visnjic, Wiengarten, & Neely, 2016). Of these, organizational and customer-related barriers are the most often studied areas of servitization (Ahamed, Kamoshida, et al., 2013). The cultural barriers typically identified with servitization are typically associated with the organizational culture without accounting for the potential impact of national culture.

An additional area for further insight is broadening the cross-country cultural context which is lacking in most servitization research (Antioco et al. 2006; Raddats & Burton 2011; Paiola et al. 2012; Gebauer et al. 2011). The OP industry is particularly well suited for understanding the cross-country cultural context since it is a global industry; with the headquarter locations for manufacturers being primarily in America or Japan. The dichotomous nature of the headquarters locations creates an opportunity for comparison of servitization for firms from two very distinct cultures (van Oudenhoven 2001) but which compete in the same markets, with similar offerings, and similar technologies.

The office products industry and servitization

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 et al., 2013). By the late 1990's Xerox and the remaining OP industry manufacturers began moving shifting to services again and were cited as early adopters of services (Finne et al. 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 2014).

The trend to services has also been accelerated by market pressures. Business practices that have traditionally been paper based have begun shifting to a combination of paper and digital documents (Guimbretiere 2003), resulting in a decline in the volume of print and copying (Economics, 2016) which is placing significant pressure on OPI manufacturers' business models (Lecompte 2013), increasing the importance of services as an alternative revenue and margin stream for office product manufacturers (Huster 2011). These services have evolved to include more complex outcome based services such as business process outsourcing, business process optimization, and IT integration (Ahamed, Inohara, & Kamoshida, 2013) as evidenced by Xerox's outsourcing of key processes and infrastructure elements for the New Jersey Turn-Pike Authority (Xerox 2010). The level of servitization within the industry is evidenced by one of the industry leaders, Xerox, which generates over 50% of its revenues from services, making its servitization level close to IBM's servitization level (Lecompte 2012) during the time period of this study.

The extent of servitization within the industry and the OP industries long history with services makes the industry a fertile ground for exploring servitization as evidenced by OP industry manufacturers being frequently cited as examples of servitization in academic research (Geum et al. 2011; Grubic 2014; Paiola et al. 2012; Pardo & Bhamra 2012; Reinartz & Ulaga 2008; Rothenberg 2007; Santamaría et al. 2012; Visnjic & van Looy 2013; Wilson et al. 2007).

Corporate culture and national culture

Corporate culture can be influenced by the organizations national culture and value system (Minkov, Minkov, Hofstede, & Hofstede, 2010). This was demonstrated in a study of sustainability initiatives which identified the how national culture characteristics influenced the implementation of sustainability programs (Hou & Neely, 2013; Visnjic et al., 2016). Another example is a recent study in Japan wjocj identified barriers 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, Tan-no, Watanabe, & Mochimaru, 2016, p. 262).

A misalignment of corporate culture and servitization efforts can represent a barrier to servitization (Coreynen & Matthyssens, 2015) making the understanding of the cultural dynamics for servitization critical. 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, & Kirkman, 2011), and the before mentioned impact of national culture on corporate culture (Minkov et al., 2010), there is a gap in current research to identify how the convergence of national culture, and corporate culture can impact servitization efforts. This research meets the call for further research into how the relationship between national culture and corporate culture affects servitization efforts (Bao & Toivonen, 2015).

Research approach

Research question

By utilizing a combination of qualitative data (elite interviews) and quantitative data (survey data) in an iterative inductive approach with grounded theory as the general research method (Fernandez et al., 2007) this research seeks to identify the heretofore hidden barriers to servitization. Specifically, the research will attempt to answer the following research questions:

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. By examining how groups of firms within the OP industry differ from one another in the servitization process (either level of servitization, or the types of service offerings they provide), can new heretofore unidentified factors be identified that are limiting individual firms or groups of firms in their servitization efforts?

The longitudinal nature of the underlying study used in this research addresses the gap Baines (2008) identifies in terms of there being limited studies which provide understanding into the evolution of servitization in firms. This study also addresses the need for more quantitative research in servitization (Aarikka-Stenroos & Jaakkola 2012; Jacob & Ulaga 2008; Gebauer et al. 2011). Finally, the study addresses the need for broader research studies to link servitization to outcomes for the manufacturer, customer outcomes, and industry turbulence (Ostrom et al. 2010; Gebauer et al. 2011; Kindström 2010).

Research method

Grounded theory is the general method used in this research. By using grounded theory as the general method, with both quantitative and qualitative phases of research, this research is able to identify new factors which impact servitization and to expand the scope of existing theory. Consistent with grounded theory practice, the literature review for this research was delayed until the completion of the quantitative grounded theory study in order to avoid apriori theorizing versus letting the data guide the development of theoretical insights (Glaser & Strauss, 2008).

The research was conducted in two phases with the first phase using quantitative grounded theory method to analyze a longitudinal study of decision makers responsible for purchasing services in addition to corporate reports and market data from a leading OP Industry research firm. By examining data aggregated at the industry level and for individual manufacturers and groups of manufacturers, this phase was able to characterize differences between groups of firms within the industry.

Whilst the first phase could identify differences between groups of firms, the results could not explain why these differences existed. Consistent with the iterative inductive approach of grounded theory (Glaser & Strauss, 2008), a second phase of research was conducted using elite interviews. 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).

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 OPI market (Photizo 2012). The study has been conducted continuously since 2008 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 OPI providers. The distribution of survey respondents by year and country is available on request from the authors. 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. Most servitization research is based upon the manufacturers view of services, creating a need for also understanding the customer viewpoint (Gebauer 2008; Lemke et al. 2010).

The second data source is the publically released financial statements for the top 14 manufacturers in the industry. All of the firms except one (Samsung) are headquartered in either America or Japan. A third data source are the service revenues which are taken from a leading market tracking firm for the OPI industry (Stewart 2012). In calculating the level of servitization for the OPI industry, individual OPI firms, and groups of OPI firms, the firms OPI services revenue was divided by the firms total

OPI revenues, consistent with the approach identified by Fang et al (2008) for measuring servitization.

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.

Phase 1: Using quantitative grounded theory to understand OP industry servitization

For this research the quantitative grounded theory method (Glaser 2008) was utilized to analyze the data from the DMTS, total OPI revenue data, and the OPI 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 (Locke 2001; Wagner et al. 2010; Martin 1986). 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). The full literature review was delayed until the completion of the grounded research analysis in order to avoid creating a situation in which the researcher's prior knowledge results in bringing a priori theory to the analysis, versus letting the analysis of the data define the theory (Glaser & Strauss 2008).

The grounded theory method used in this research began with identifying the core index and the crude indices (or variables) that could generate theory (Glaser 2008) by comparing all of the variables from the study in order to determine if there was any directional relationship between the variables. The level of servitization is 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, p.46) the next step after identifying the indices was to create composite indices based upon combing individual variables. In order to develop theory, the final step involved analyzing the relationship of the composite indices to each other, and to the core index with the intention of theory emerging from this analysis. The following sections describe the analysis associated with each index.

Consistent with the approach identified by Fang et al (2008) the measure of servitization in this analysis is performed by comparing service revenues to total revenues. For the OPI the level of servitization is calculated by comparing the total OPI revenues (Jamieson 2013) to the OPI service revenues (Photizo 2013) to derive a percentage of total revenue contributed by services.

As shown in Table 1 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. As a result this is a significant percentage which is growing rapidly, with 100% growth in the four years of the study. 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 1: OPI Industry Servitization Level

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

Sources: Publically released financial statements, (Stewart 2012)

Service offerings 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 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). It is important to understand that a single contract can contain multiple elements, including both product-centric and customer-outcome-centric elements.

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 Kaiser's criterion 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 & Kallenberg 2003), the value proposition provided by the service versus the recipient of the service (Ulaga & 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. Table 2 displays the 31 service contract components grouped into the six indices based on the PCA output compared against existing typology categories. Interestingly the two outcome centric indices align well with outcome centric categories in existing typologies. The product centric indices also align well with the product centric categories in existing typologies.

Table 1: MPS Agreement Components

Which of the items are included, or will be included, in your MPS agreement?	(% of contracts)	Ulaga & Reinartz	Oliva & Kallenberg	PCA Analysis
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
Providing same day response time (for service calls)	32%	1. PLCS	1. BIBS
Assessment of business processes	21%	3. PSS	3.PS
Environmental sustainability programs	14%	4. PDS	4. OS

Ulaga & 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 imp.	3. PS (Professional Services)
Relationship-based end-user process oriented services such as managing operations, managing maint. Funct.	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 from Photizo Decision Maker Tracking Study: (Photizo 2012)

By collapsing the four product centric indices 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 into a new composite index called Outcome Focused Services the clarity of the indices relationship to servitization can be improved. Table 3 shows the two new indices and their individual service components.

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 44% of 50% today. These results are shown in Table 4.

Table 3: Service offering indices

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

Table 4: Proportion of customer outcome service offerings in 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)

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 5 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 5: Service results: product centric vs. customer outcome indices

Service Results	Product vs. Customer Outcome
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
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:	

A comparison of the service offerings PCA results to models from leading servitization researchers (Ulaga & Reinartz 2011; Oliva & Kallenberg 2003) indicate there is a high level of alignment among the models. In order to explore this dynamic further the services results indices were aggregated to create two new indices named product centric and customer centric (Table 5). 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 6). 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 6: Service results for product centric vs. customer outcome results

	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. However, a further analysis of the data resulted in new findings.

Japanese versus American firms

Within the OPI industry, there is an almost dichotomous split in terms of headquarter locations for the firms. Four of the top 11 firms in the industry are based in America, and six are based in Japan. The remaining firm is based in Korea. All of the firms began service programmes during the same time period and all of the firms compete on a global basis.

Based upon cross tabulations of the core index, servitization, the American firms had a significantly higher level of servitization relative to the Japanese firms. American firms grew from 16% of their revenues coming from services in 2008 to 39% of their 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 rates between American and Japanese firms grew from 11% in 2008 to 28% in 2012. These results are shown in Table 7.

Table 7: Servitization% 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)

The same approach was utilized to analyze the service offerings indices to search for differences between American and Japanese firms. Interestingly, the amount of customer-outcome-centric service offerings were almost identical for American and Japanese firms. In 2008 Japanese firms had 37% of the service results being customer-outcome-centric while American firms had 38% of the service results being customer-outcome-centric. By 2012 this proportion had grown by almost the same amount for both Japanese firms (17% increase) and American firms (16% increase). The results are shown in Table 8. These results indicate that Japanese firms were offering comparable services to American firms in this period.

Table 8: Percent of service offerings with customer outcome service components based on headquarters location

	2008	2009	2010	2011	2012	Growth
American Vendors: Customer Outcome Service Components	*38%*	35%	37%	56%	54%	+16%
Japanese Vendors: Customer Outcome Service Components	37%	34%	36%	57%	54%	+17%

Source: *(Photizo 2012)*

Then the same analysis was performed using the service results index to determine what proportion of the results were customer-outcome-centric, once again American and Japanese firms had almost equal starting points in 2008 (21% and 19% respectively). They also grew at very similar rates with the gap between Japanese and American firms only increasing from 2% to 5% over the 5-year time span. The results for both service offerings and service results are shown in Table 9.

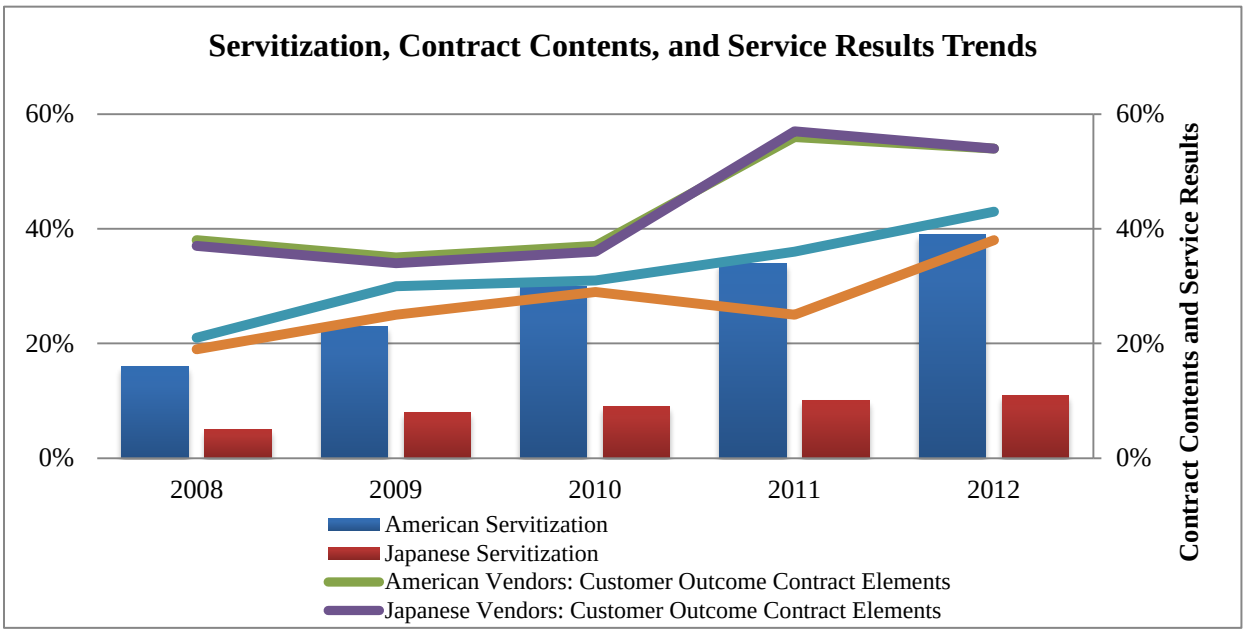
Table 9: Percent of service results with customer outcome results by HQ location

	Year				
	2008	2009	2010	2011	2012
American Vendors: Customer Outcome Focused Results	21%	30%	31%	36%	43%
Japanese Vendors: Customer Outcome Focused Results	19%	25%	29%	25%	38%
Difference	-2%	-5%	-2%	-11%	-5%
Industry Average	19%	27%	31%	28%	40%

Source: (Photizo 2012)

When the indices were separated into results for Japanese service engagements versus American service engagements, both sets of firms were very close in both the proportion of customer outcome focused services they offer, and in terms of the service results they achieve which are customer outcome centric. However, the American firms are achieving much higher service revenues than Japanese firms with almost 40% of their revenues coming from services. One of the largest American firms, Xerox, announced in Q1 of 2014 that over 55% of their revenues came from services and they anticipate this number increasing to over 66% by 2017 (Burns 2014). Japanese firms have a much lower rate of servitization with only 11% of their revenues coming from services in 2012. Figure 1 compares all three indices for Japanese firms and American firms.

Figure 1: Summary of HQ Segmentation Results



Based upon the results from the first phase of research there would appear to be an inhibitor to the servitization of Japanese 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 American and Japanese firms in terms of servitization levels, despite both Japanese and American firms offering similar services and obtaining similar customer outcomes. Through the remainder of this research, this will be identified as the Servitization Gap. Japanese firms appear to be suffering from the service paradox defined by (Gebauer et al. 2005) in which firms invest in services capabilities and offerings, but fail to achieve significant revenue growth from this investment. In order to understand why Japanese firms have a Servitization Gap relative to American firms, a second phase

of research was conducted using elite interviews with key executives in the industry representing both American and Japanese OP Industry firms.

Phase 2: Qualitative grounded theory using elite interviews

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, 2010b). For this interview the key criteria for identifying an individual as a potential participant was consistent with this criteria with the individuals holding (or having held) senior positions at XYZco with responsibility directly or indirectly related to the firms efforts to develop a services business. To encourage cooperation the request for the interviews focused on a single topic request (Kincaid & 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 & Rockman, 2002), typically their office, but also in other environments, including one interview which was conducted in a cafeteria during an industry conference. One of the interviews was conducted in person, with the other three interviews being conducted via telephone. Interviews typically lasted from one hour to ninety minutes.

The interviews were semi-structured, with a core set of ten questions. The questions were open ended to maximize the value of insights gained from the elite interviews (Aberbach & Rockman, 2002). In the Professional Social Inquiry taxonomy (Smith, Dwyer, & Prunty, 1981) the interviewer is a professional / autocratic based upon his role as an industry consultant and analyst. This allows the interviewer to provide a high degree of description regarding of the participants, multiple perspectives, and an authoritative knowledge which provides supporting context to the research. Interviews lasted between sixty and ninety minutes.

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 since these executives would have the most comprehensive view of the organizations operations and servitization process (Kincaid and Bright 1957). Participants were selected to represent a cross section of the organization including both service and non-service specific roles. This approach of using multiple sources assists in minimizing the chance that the respondents provide a 'party-line' (Berry, 2002). While two organizations limited interviews to a single, senior individual, multiple executives were interviewed at the other 4 in order to gain a comprehensive set of viewpoints. The roles of the participants and the location of their company's headquarters are listed Table 10.

Table 10: Elite Interview Participants

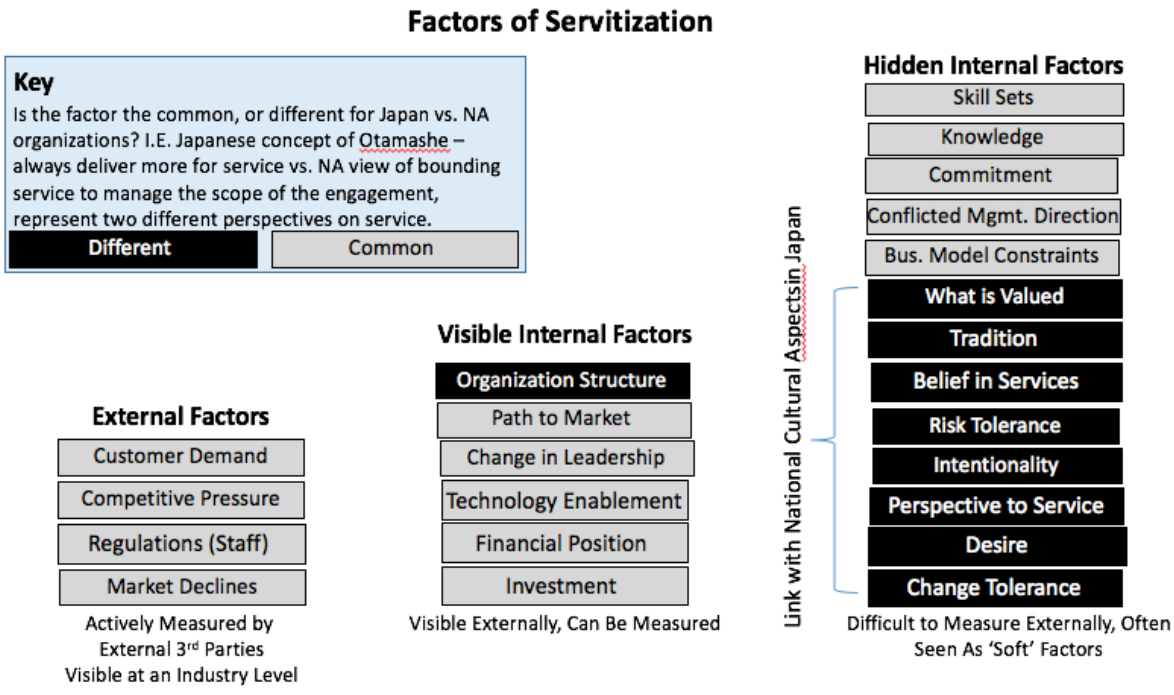
Organization /HQ Location	Title	Executive Location
Organization A - America	Executive VP	America
Organization B - Japan	Corporate Director	Japan
Organization B - Japan	General Manager (Services)	Japan
Organization B - Japan	Marketing Director (Europe)	Europe
Organization C - America	Executive VP/GM	America
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

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 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 (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 very critical in elite interview 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).

Coding is a critical element in analyzing data from elite interviews. According to (Basit 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 analyzing 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 where then complied 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: external factors, visible internal factors, and hidden factors. These are identified in Figure 2.

Figure 2: Factors in servitization



External factors can be characterized by their ability to be actively measured by third parties and their visibility outside of the firm at an industry level. Visible internal factors include those factors that are visible externally and that can be measured, but which are 'internal' to the firm. The hidden internal factors are those factors that are visible internally but which are difficult to measure externally and which are often unseen or invisible factors that can be described as 'soft factors'.

Hidden factors in servitization

The companies culture can be defined as the sentiments, beliefs, and attitudes of an organization (Ray, 1986). Based upon this definition, eight of the thirteen hidden internal factors are associated with the corporate culture of the firms interviewed. Organisational culture is cited as a key issue in servitization both in terms of having a service culture (Gebauer et al. 2005; Turunen & Toivonen 2011) and in senior management leading the shift to a service oriented mental model (Kindström et al. 2013). There are very distinct differences between the culture and operations of Japanese and American firms (van Oudenhoven 2001) which could present barriers to servitization. A recent study into the Japanese corporate culture decision making process has identified barriers to implementing major strategic shifts such as servitization (Karube et al. 2009) due to the Japanese business culture.

In analyzing the responses to the interviews, there was a clear difference in the views expressed by the Japanese firms versus the American firms in terms of these eight cultural elements associated with servitization. For example, in the category "what is desired", most respondents from Japanese companies cited a core belief in their companies that products are of higher value, with this believe often being reinforced by top executives (advertently or inadvertently) as in the case of the following statement:

"When the big conference 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 complete in one fell swoop. One statement from the CEO was absolutely flattened, because it said, "Look, we are not serious about it." Marketing Executive – Organization B (Japanese Company).

However, in American companies, interviewees expressed a strong belief in the value of the services business model (belief in services) as shown by the following quote:

"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." Executive VP/GM – Organization C (American Company)

Additionally, in American companies, the vision for services appeared to be much more 'top-down' driven from the CEO's office versus in Japanese companies, the vision was identified as starting at lower levels in the organization with senior management being convinced of the validity of this strategy and seeing results before committing to it.

"So it is his vision. He really drew it out and it is one of the first times that I ever heard him really talk about it in depth…" Vertical Marketing Executive – Organization E (American Company).

In terms of risk tolerance, there was a clear difference between Japanese and American 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 Servitizaton that have a significant risk profile (Karube, Numagami, & Kato, 2009).

Each of the additional factors (what is valued, tradition, intentionality, risk tolerance, and change tolerance) exhibited similar response with opposing positions by American and Japanese firms.
Based upon this research, the authors propose that in addition to existing servitization factors which address both the external factors and visible internal factors for a firm, there are a number of hidden internal factors which also can be barriers (or drivers) for servitization. A majority of these hidden factors have diametrically opposite values for American and Japanese firms. These factors are strongly influenced by Japanese national culture. By broadening the context beyond American and Japanese firms, the theory can be stated as "there are specific organizational cultural norms, which have been influenced by National cultural norms and which can be either drivers or barriers to firms attempts to servitize their business."

Discussion

Research contribution and limitations

By using a longitudinal study of end-customers this study demonstrates how the OP Industry has shifted its offering and revenue stream from a product-dominant model towards a services-dominant model, providing support for Gebauer's (2011) argument that servitization can change industry structure. It also demonstrates how the OP Industry's offerings have shifted from product-centric to customer-outcome centric offerings providing some indication that a firm's servitization process is impacted by the firm's environment (Turunen & Finne 2013).

In identifying the gap between American based firms ability to build service revenue versus Japanese firms, the results suggest that Japanese firms as a whole may are suffering from the service paradox (Gebauer et al. 2005). The Servitization Gap created by this paradox is represented by the gap in servitization levels between American and Japanese firms. The study identifies eight hidden factors for servitization which are associated with culture, and which appear to be influenced by Japanese national culture. There have been many studies and business articles on the unique aspects of Japanese business culture (Calantone, Di Benedetto, & Song, 2010; Karube et al., 2009; Saijo, 2012), but these studies have not addressed the Japanese business culture's impact on the attempts of Japanese firms to servitize. This research contributes to the understanding of how the Japanese national culture may be an inhibitor to successful servitization.

The study also contributes to current research by providing insights into servitization by studying the recipients of services – the end customers and the results they achieve from vendors' contracts. By comparing this to the level of industry servitization, the study provides an interesting link between the customer impact of services and the level of servitization for an entire industry.

This research provides a new model for categorizing the factors of servitization by addressing the unseen 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, & Friedli, 2005) and firms failing to reach a critical mass in their servitization efforts despite making significant investments in servitization efforts.

Limitations and recommendations for further research

The primary limitation of the study is that it is limited 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 a theory, which needs to be tested and validated in other industries. In addition, the links between national culture, corporate culture and servitization in relation to these eight hidden

factors needs to be quantified. Further studies in other industries would provide valuable insight into the robustness and validity of the proposed model.

Management implications

A number of studies (Bandinelli & Gamberi 2012; Hou & Andy Neely 2013; Ahamed, Kamoshida, et al. 2013b; Fang et al. 2008; Neely et al. 2011) have identified the challenges in developing successful servitization including the need to look at servitization from a holistic business model perspective (Kowalkowski et al. 2012). 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 & Kaboski 2009) in both developing and developed economies (Loungani & Mishra 2014) in order to maintain the competitiveness of their manufacturing industries (Nirupam Bajpai 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.

Recent work by Chae (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 American firms in servitizing their business in an industry which is seeing declines due to maturity and disruptive market shifts (Crowley & Haesen 2012) 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 (Gebauer et al. 2011; Lusch & Spohrer 2012; Kindström 2010) which would indicate that groups of firms with barriers 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, making it imperative for these firms to understand and address their barriers to servitization.

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Appendix 1: MPS Decision Maker Tracking Study™ Questionnaire Topics

Demographics / Firmographics	*Brand*
Country in which the firm is located.	Unaided awareness of MPS vendors
Company size (revenue and employees)	Aided brand awareness
Respondents role in selection process of MPS vendors	Familiarity with MPS vendors (by brand)
Industry classification	Willingness to consider MPS vendors (by brand)
What percent of total IT spending does printing/copying represent	Willingness to recommend
Respondents department and title	*Components included in contract & Satisfaction Measures*
Monthly print volume	Assessment of business process
Ownership structure for products (lease/own)	Assessment of device utilization
Pre- and Post-MPS contract number of devices	Assessment of document workflow
Types of devices installed	Assessment of end-user requirements
Pre- and Post-MPS page volume	Automatic supplies replenishment
What brands of print/copy/scan devices are installed	Change management communication
Where does MPS rank relative to other IT priorities	Device installation
Is there a central reprographics department (CRD)	Document disposal
Is there a different contract for the CRD	Document offsite storage
Who is the CRD provider	Document recycling services
MPS Contract Purchase Dynamics	End user training
Is this your first MPS engagement	Environmental sustainability programs
Contract coverage (site, multi-site, national, etc.)	Flexibility in structuring MPS agreement
Why do you no longer use provider X	Help desk services
What is the length of your agreement	Implementation of document workflow software/solutions …
How is the pricing of your MPS agreement structured	Knowledgeable sales staff
What is the price of your MPS contract per year	Knowledgeable technical / repair staff
How many employees are covered under the contract	Manual recording of meter reads
What percentage (annual basis) has the MPS contract reduced cost	Monitoring of device utilization
Who was the previous MPS provider	On-site support staff by vendor
Desire to have 1 vendor for both MPS and IT Services Management	Overall vendor performance
How Important are the Following Attributes in Vendor Selection	Physical survey to identify user needs
Past experience with vendor	Physically moving device to new location
Reputation as a hardware manufacturer	Print policy guideline
Reliability	Print rules to direct print to specific devices based upon document..
Flexibility	Providing 2 hour response time (for service calls)
Willingness to customize MPS	Providing 24 hour x 7 day service
Ability to meet MPS specifications	Providing 4 hour response time (for service calls)
Quality of the vendors assessment & recommendations hard copy fleet	Providing 9 hour x 5 day service
The vendor is already the supplier of our MPS service	Providing same day response time (for service calls)
Willingness to support installed devices of a different brand than MPS provider	Range of service offered
Price	Recommendation on device deployment
Colleague recommendation	Remote monitoring of device for supplies
Reviewer recommendation (magazine, tech publication, etc.)	Reporting of device maintenance actions
Name recognition	Reporting of device utilization
Reputation as a hardware manufacturer	Replacement devices installed by the vendor
Reliable	Response time to questions and contract requests
Committed to environmental sustainability	Other

Assessment Dynamics	*Accomplished (In regards to our fleet of imaging devices which of the following do you feel your company has accomplished)*
During the evaluation process, did an MPS vendor provide an assessment of your device fleet	Understands the cost for all hardcopy devices
Prior to making your last decision, how many assessments from different venders were performed for the MPS contract	Document workflow consulting
Did you pay for the assessment	Service performance reporting: number of service incidents
Which vendor(s) provided your assessment(s)	Service performance reporting: Average response time per incidence
Why did you select a different vendor than the vendor who performed our MPS assessment	Service performance reporting: Device availability statistics Assessment of services Response time to service call Pricing Proactive in identifying and addressing your needs Being accessible to address questions and concerns Timeliness of supplies replenishment Management of change programs Assessment of business processes Management of change programs