LEADERSHIP IN HIGH-VALUE SERVICES FOR MANUFACTURERS: PEOPLE AND THE DELIVERY OF ADVANCED SERVICES

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Abstract

This short paper sets out to further develop the debate around the practices and technologies within operations that are critical to success with servitization. This paper draws findings from four companies that are leading in their delivery of advanced services, and reports on the organisation and skill-sets of peoplewithin these organisations. In particular it examines the roles and activities of people within the front-office, identifies the skill-sets that are espoused as being critical, and then seeks to present the rational that explains this importance. It concludes by proposing a working hypothesis for future studies in this field.

Keyword: Servitization, Product-Service Systems, Through-life Services.

1.Introduction

The research described within this paper has been carried out as part of a macro-programme to investigate the practices and technologies that successful companies are employing within operations to deliver advanced services(see Baines. and Lightfoot, 2012a; Baines et al, 2012b; Baines et al, 2012b; Lightfoot et al, 2011a; Baines, et al 2011b; Baines, et al, 2010; Baines et al, 2009, Baines et al, 2005). Principally, this programme has conducted in-depth case studies of companies that are leading in their servitization strategies. These case companies include Caterpillar, Xerox, MAN and Alstom. Here, we have sought to explore not only the human factors, but several areas of operations that are indeed impacted by servitization. These include facilities, information and communication technologies, vertical integrations performance measurement systems, and organisational processes. In each case we have been anxious to share our findings with both the broader research community and manufacturers contemplating servitization. In this paper we deal explicitly with those aspects of our macro-study that have investigated how people are deployed and their associated skill-sets.

The intention with this paper is therefore to both present our findings and provoke debate about people and their skill-sets within successfully servitizing manufacturers. Our hope is that this will help to stimulate further studies to investigate how the skill-sets of people in the servitized organisation differ to those in production. To realise this purpose we have organised this paper to first summarise how people are allocated within the organisational structure of a servitizing manufacturer, and then explore the characteristics of such people in the companies we have studied, before setting out the rationale between these characteristics and the delivery of advanced services contracts. Finally, we draw conclusions and set out the future direction for research.

2. Context

Servitization refers to a process by which manufacturers build their revenue streams around services coupled to their products. These services can be thought of as being either base, intermediate or advanced (Table 1). This reflects the organizational stretch beyond production competencesthat is necessary for a manufacturer to deliver services. Table 1 summaries the characteristics associated

with each of these clusters and the examples of services offerings associated with each.In advanced services particularly the manufacturer will typically take on product support service activities (such as maintenance, repair, condition monitoring) that may otherwise be the responsibility of the customer, and in doing so has multiple interactions (or touch-points) across the life-cycle of the services contract. These would not usually occur in conventional manufacture, and these suggest the changing demands on the people who work within manufacturers and have the responsibility of delivering advanced services.

	Principle on which cluster is defined	**Relative characteristics of cluster**			**Examples of services offerings within cluster**
		Range of service activities	**Extent of risk**	**Revenue payment**	
Base services	Focus on product provision	*Narrow*: Activities centred on and around production competences	*Low*: Easily delivered for an enterprise with manufacturing competences	*Point*: Largely on completion of contract	Product / equipment provision, spare part provision
Intermediate services	Focus on condition maintenance	*Broadening*: based on the exploitation of production competences to assure state and condition of equipment	*Medium:* Increased expose to the consequences of equipment faults	*Periodic:* Some upfront and/or on completion. Maybe with interim payments	Scheduled maintenance, Technical help-desk, Repair, Overhaul, Delivery to site, Operator training, Condition monitoring, In-field service.
Advanced services	Focus on outcome assurance	*Extended:* stretching the manufacturing enterprise to take on activities that are usually internal to the customer	*High*: Financial penalties incurred almost immediately if equipment fails to perform as specified	*Linear:* Pay-through-use with period adjustments in rate	Customer support agreement, Risk and revenue sharing contract, Revenue-through-use contact, Rental agreement

Table 1: Meta-clustering of services offerings on the basis of organisational stretch from production based competences.

The behaviour of people within a system is affected by many variables. Kurt Lewin(1935; 1951) was one of the earliest researchers to identify that behaviour is a function of the person and the environment in which they find themselves, such that people's behaviours are the response to the dynamic interactions between the particular set of variables in a given situation. The work environment can be thought of both as including both the physical conditions (such as heat, light, noise, vibration) and the social factors (such as leadership, team working, communication, motivation and reward structures). Likewise the person themselves can be defined in terms of their physical condition (age, gender, strength, dexterity) and psychological attributes (such as personality, attitudes, beliefs, emotions). There is a wealth of literature in the social sciences that looks at how factors, or sets of factors, affect the behaviours of people and the nature of person-environment interactions in various environments (Kristof-Brown et al, 2005). Amongst this corpus bodyof literature a vast amount examines behaviours in working environments, particularly from work psychology and organisational behaviour research domains. However, despite this high level of attention to work behaviour, the field of literature narrows considerably when looking specifically at services.

Research investigating people and their behaviour in the service industry that has emerged in recent years. This has focused on various topics, such as: personnel, physical environment and perceptions of corporate image(Nguyen and Leblanc, 2002), self-managing service teams (de Jong et al, 2008), personnel management systems (Lewis and Entwhistle, 1990), supervisor communications

(Johlke and Duhan, 2000). A few researchers have set out to distinguish between the types and behaviours of people in service organisations, and how these differ to those in production. Theodore Levitt (1983) argues, for example, that people in manufacturing think technocratically and by contrast people in service tend to be more humanistic. Here it is important to recognise that there are various forms of service organisation, such as professional services, and these have their own particular demands of people and how they work. Quite simply, different service operations demand different skills from and abilities from people.

The most prevalent area of service personnel research has explored the inter-relationships between service provider, personnel personality characteristics, and personal traits. These traits include 'job resourcefulness' (Licata et al, 2003; Harris et al, 2006), 'employee adaptiveness' (Gwinner et al, 2005), and 'customer orientation' (Baydoun et al, 2001; Hennig-Thurau, 2004; Donovan et al, 2004; Farrell and Oczkowski, 2009). Most of this service personality research seems to have been devoted to investigating the effects of the 'service orientation' characteristic on performance (Hurley, 1998; Teng et al, 2007; Ekinci and Dawes, 2009; Teng and Barrows, 2009, Lin et al, 2010). The interest in service employee personality has even led to attempts to generate trait measurement instruments for personnel selection and development (e.g. Carraher et al, 1998; Alge et al, 2002). AlthoughLioa and Chuang (2004) included personality in an attempt to bring together both the organisational and individual factors that influence service performance of employees and customer outcomes. Yet, in no aspects of services research has a comprehensive framework been established that definitively distinguishes the characteristics of people who tend to fit into the differing environments of services and production.

Servitization is a relatively newbut growing field of research that fits at the confluence of the more traditional communities of production and service operations (Baines et al, 2010). It deals with the exploitation of services by product manufacturers. As can be expected, there are only a few researchers that have explored either the behaviour or the desirable characteristics of people in this context. Exceptions include Brax (2005) who notes credibility of expertise is fundamental, and similarly, Vandermerwe and Rada (1989) who stress the importance of identification with the individualcustomers. Other than these, studies have yet to set out the broad characteristics of people who perform best in a servitizing manufacturers, therefore gaining such insight is the purpose of this paper.

3. Research design and execution

Our research has therefore set out to identify and understand the practices and technologies that successful companies are employing within operations to deliver advanced services. Our process has been to conduct surveys and case studies to both identify and explore companies that are leading in their delivery of servitization. In this specific paper we deal explicitly with those aspects of our macro-study that have investigated people, and in particular how people are deployed and skilled to deliver advanced services.

The findings presented in this paper have principally been established through in-depth case studies of Caterpillar, Xerox, MAN and Alstom. These companieswere chosen because they excel in the delivery of advanced services which are coupled to complex assets. The case studies were then designed and executed conventionally (Voss et al, 2002). The research questions were translated into a data-collection protocol that sought to capture, for each case, how people were organised and their associated skill-sets. As this a relatively unexplored aspect of servitization, our process was largely inductive, with the over-ridding questions setting out to establish how and why each company deployed people in the style it did. Hence, we did not purport to extensively survey the skill-sets of people in the front-line of delivering advanced services; rather we sought to establish those principal skills that each organisation espouses as important and valued. This data collection protocol was then piloted in a large aircraft manufacturer in northAmerica.

The data collection process was then executed at our four collaborating companies. A range of personnel were interviewed in each case, ranging from maintenancetechnicians through to senior executives with responsibilities for services. Complementary interviews were also conducted with a small but representative set of customers. Most interviews were conducted with two researchers, notes were taken, and conversations were recorded and transcribed. The resulting data was then collated. Cross case analysis was then conducted with synthesis beingaided by mind-mapping

techniques, and this led to common themes being established as responses to the principal research questions. Those responses are now summarised in the following sections of this paper. Here, we are limited by agreement to the extent to which we can describe the particulars of each case.

4. Organisation and deployment of people delivering advanced services

Across the cases, the policy is to co-locate (most) people who are responsible for the delivery of services in a front-office with its own facilities, processes, and a large extent of autonomy. This fits with the notion of a front-office. The front-office refers to a company's departments that come into contact with customers and typically includes the marketing, sales, and other customer facing staff. The back-office is the part of the business dedicated to running the company itselfand typically includes people who deal with design, development, production, and other activities that are rarely seen by customers.Here, it is important to highlight that the front-office / back-office distinction should not be confused with the physical location of facilities. The front-office is defined by the nature and focus of activities and can therefore be distributed around wherever such interactions take place.

All forms of manufacturers will have both a front-office and back-office, but in our case companies the increased demand for customer interaction results in extensive front-office operations.Thisbreadth of operations in the front-office can be thought of as micro-vertical integration, and is impacted by the extent to which the manufacturer retains more conventional production operations and the autonomy of these. In turn, this relationship also affects whether some service-centred support activities are retained within the production business to smooth integration with the front-office.

Although the breadth of operations in the front-office may vary somewhat, evidence from our cases suggest that there are commonstructural characteristics to the way in which people are organised. We have set out to summarise these in table 2. Here, the differences are highlighted between the front-office (which focuses on the delivery of products into the field and then the supporting services) and the back-office (which focuses on the design and production of products). The activities of people within the front-office are then furthersubdivided.

Categories	**Common structural characteristics**		
	Front-office		**Back-office**
Overall focus of staff	Delivery of product-service offerings		Product design and manufacture
Typical role of staff	Frontline customer contact	Support customer contact	Enable customer contact through product manufacture
Examples of staff in role	Account sales/managers, Contract Sales, Field engineers, Operations centre manager, Customer services agreement manager	Condition monitoring technicians, Technical services manager, General managers of parts & service, Product support manager	Research scientists, Engineering design, Production management, Production engineering.
Usual contact person within customer	Project manager, Account manager, Equipment operative	Equipment operative	Equipment operatives, Project managers, Account managers
Extent and frequency of customer interaction	High / maybe weekly	Medium / maybe monthly	Low / periodically and arranged around new product introduction

Table 2: Structural characteristics common in the delivery of advanced services

The form and extent of interactions with customers varies according to this role. With an advanced services contract the frontline staff will interact with (or touch) customersperhaps weekly, indeed in some instances staff might be co-located in a control-room which is within the customer's facilities and so meet daily. These might be customer staff who are responsible for managing contracts, or staff who are operating equipment. By contrast, support staff (such as condition monitoring technicians) will interact with actual customer staff much less frequently. They may, for example, enter into discussions with operatives when diagnosing an equipment fault.

Finally, it is important to highlight that amongst the four cases Field engineers are often considered as frontline staff for the delivery of advanced services. This occurs because of the frequency and extent of interactions with the customer, especially equipment operatives. So influential are such interactions that in some cases such engineers are scheduled to always arrive at customers facilities (say for scheduled maintenance activities) just prior to equipment being shut down (rather than after). This way the engineer can meet the operatives, so sustaining relationships with customer personnel, as well as gaining insight into any early signs of equipment failure that might go undetected by other condition monitoring systems.

5. PRINCIPAL SKILL-SETS EXPECTED OF PEOPLE DELIVERING ADVANCED SERVICES

Across our cases we sought to establish those principal skills that each organisation espouses as important and valued of people within the front-office. Here, we were mindful that these would vary somewhat for differing roles (front-line versus support staff), that there are basic hygiene skills that are required of all workers (e.g.: an ability to work safely), and that in some instances people in the front-office would not necessarily fulfil the espoused expectations. Nevertheless, we set out to explore whether there is set of common skills, which re-occur across the cases, and broadlyand comprehensively captured the expectations of workers in the front-office.

Analysis and synthesis of our case data using mind-mapping techniques indicated that there are indeed principal skills. These can be grouped into five themes or sets (table 3).To this end, people in the front-office are expected to possess a particular set of 'people skills' that facilitate positive relationships with customers. As described earlier, these skills may be acquired over time with experience and / or training but are usually primarily a facet of the individual's core personality. Clearly, the social skills needed to engage well with customers will be enhanced by experience but are also largely attributable to a person's natural tendency to be outgoing and socially engaging.These appear consistent with Levitt (1983) who suggested that people in service tend to be humanistic. This terminology suggests that front-line staff are likely to possess the characteristics that provide the 'people skills' needed for service job roles: concerns for the needs, well-being and interests of people. By contrast, people in production might think (or be encouraged to think)technocratically, being technically excellent, analytical, and highly reliable.

As expected, the extent to which these behaviours are demanded of individual staff do vary according to role. For example, although they can both be thought of as front-office staff, a Condition monitoring technician will need stronger technical skills relative to an Account sales manager, who will correspondingly need to be stronger at relationship building. Yet, to a greater or lesser extent all staff in the front-office will be expected to possess and apply the skills shown in table 3, whether this comes from learned ability or from their natural personality. It is also important to emphasise again that these are not the only behavioural characteristics. In general all employees are required to go about work in a safe and proper manner, turning up for work promptly, and fulfilling expectations of the employment contract. However, there are particular skills required of staff within the front-office of a servitizing manufacturer, and it is these that we have set out to identify and represent in this table.

With these humanistic skills there are inevitably trade-offs. For example, back-office staff such as designers are likely to have stronger technical skills. Therefore, front-office staff will be expected to link to these when needed. For instance, if an aircraft is damaged in use then specialist analysis may need to be undertaken by airworthiness engineers to establish the appropriate repairs. Such safety critical analysis would be undertaken by back-office staff, with the technical support team of the front-office providing the necessary field data and customer interactions. In this way the back-office are buffered from direct interactions with the customer. The reason for this was succinctly captured by the Parts and Services manager in one of our cases, who commented that 'manufacturing

people rarely understand service'. In this way the technical support staff in the front-office become brokers for finding solutions to problems.

Skill-set	Description of skill-set	Example of behaviour resulting from skill-set
Flexibility	Ability to modify working routine in order to comply with customer requirements.	Prepared to vary working hours or task to match customer demand.
Relationship building	Ability to develop and sustain close customer connections, and similar relationships with other staff internal to the manufacturer	Readilyhave meaningful conversations with customers. Forging strong people/team relationships with other staff within the front-office
Service-centricity	Awareness of customer's problems and delivering against these; readilyputting themselves in the shoes of the customer.	Appreciating the consequences of an equipment failure on the customers of our customer. Talking to people, engaging people, and so understand where they are coming from.
Authenticity	Genuinelycommitted to delivering a successful outcome for the customer	Belief in the manufacturer, its products and services. Only making commitments that can be fully delivered
Technicallyadept	Understanding of the principal operation and sub-systems of products and equipment	Being able to understand the consequences of an electrical sub-system failure on a machine

Table 3: Principal skill-sets expected of front-office staff

Sustaining the desired behaviour of front-office staff has particular demands of leadership. Our case companies indicated the importance of a fair and cooperative culture in the front-office, along with mutually consistent goals amongst the staff, and a shared interest in being successful.Various techniques were evident in our case companies for achieving such goals. In one instance, there were very clear 'Rules of the depot' which set out the values and processes of the front-office (in this instance a trackside maintenance facility). Similarly, there was evidence of staff mobility across customers, front-office and back office. In one company it was a norm to recruit staff from the customer into the front-office, with the motivation being that 'we must think like the customer and act like the customer'. Yet, this policy was carefully managed to ensure that as far as possible relationships were sustained.

Behaviour was also sustained by a comparable balance of power across the front / back offices, and here there appears to be bias towards the office which is the principal source of revenue. Evidence was apparent of front-office staff taking senior positions within the host manufacturer, and this was to ensure all operations are orientated towards customer service. This helped to ensure that the leadership culture was consistent with the expectations and working of the front-office and an acceptance that these may be different to manufacture. For example, managers in the front-office may be more willing to accept the difficulty of attaining the same high levels of worker and machine utilisation than would be normally achieved within production.

Finally, within the front-offices themselves facilities were carefully designedand managed to complement the expected behaviour of people. For example, it is common practice to have a central control roomwhich is the focal point for the management of advanced services contracts. Rolls-Royce, for example, has such a facility that manages gas turbines worldwide (Walters, 2009). Such facilities bring front-office staff physically close together. This stimulates communications, helps build relationships, and provides a hub for the complete solution of a customer's problems. Such

facilities are supported by inputs from enabling technologies (Lightfoot et al, 2011) and also help to demonstrate credibility and value to the customer.

7. CONCLUDING REMARKS AND FUTURE RESEARCH

This short paper has set out to present our preliminary findings about the organisation and skill-sets of people who are in the front-line of delivering advanced services. To achieve this we have introduced our research programme, summarising how we have found people to be organised in manufactures delivering advanced services, outlining the expected skill-sets of such people, and then why such behaviour is consistent with success. To conclude this preliminary report on our research, we have summarised our findings about people in the following hypothesis:*Delivery of an advanced service contract is positively impacted by front-office staff who are humanistic in their behaviour, being skilled in flexibility, relationship building, service- centricity, authenticity and technical aptitude, as this ensures speed and effectiveness of response.*

As discussed earlier, some research has already looked at the employee characteristics needed for service job roles, such as resourcefulness, adaptiveness, customer and service orientation. It may be that the five skill sets that emerged from our work have captured some facets of these personality characteristics but our approach and context is different. We are seeking to specifically identify front-office employee skills in servitized manufacturers, and not the general personality characteristics relevant to more conventional service operations.

Our future work will now continue to verify that these are both key factors and subtly different to the behaviouralcharacteristics in a more production-centric environment. We will also set out to combine these findings with our knowledge of practices in facilities, vertical integration, technology enablers, performance measures, and organisational structure and processes. Collectively, these will provide a comprehensive description of the factors that are key to success in the delivery of advanced services, and so key to the successful adoption of servitization strategies within manufacturers.

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