DEVELOPING A FRAMEWORK FOR ASSESSING THE VALUE-IN-USE OF PRODUCT-SERVICE SYSTEMS: A CASE STUDY

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Abstract

Purpose
That value is created "in use", as opposed to embedded in products, is a foundational premise of the service-dominant logic; however, the assessment of customer perceived value-in-use has not been explored. As servitization pervades manufacturing, suppliers are challenged to assess customer perceived value for integrated product-service systems (PSS). This paper proposes a new framework for assessment of perceived value of hybrid product-service offerings.

Design/methodology/approach
The framework developed from literature is supported by exploratory research (ten interviews across a dyad in a maintenance context). The framework includes assessment of supplier attributes: product, service and relationship delivery, as well as value created by the supplier's business networks. In contrast to the value models which have been subject to previous empirical research, the framework also includes assessment of the quality of the customer's product/service processes.

Findings
This research illustrates the superiority of our new value-in-use framework over existing embedded-value, supplier-attribute based measures of perceived value. We find that value-in-use - the achievement of customers' goals, purposes and objectives - can be elicited; it is however, processual, is co-created by supplier-customer interaction, and emerges during consumption. In comparison to traditional embedded value measures, our framework assesses value in the customer's space and makes explicit underlying motivations.

Research limitations/implications
Limitations of a single dyadic context, lack of a temporal dimension, and, absence of quantitative confirmation, will be addressed in future research.

Practical implications
Lays foundations for development of new measures of co-created value.

Originality/value
Addresses the paucity of value-in-use measures for PSS and, more generally, for intangible servitized offerings.

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1. Introduction

That value is created "in use", as opposed to being embedded in products, is foundational to the service-dominant logic (SDL) (see FP6 and FP7 in Vargo and Lusch 2004, 2008). The recently added tenth foundational premise of the SDL more explicitly observes the experiential nature of value, by stating that value is "*uniquely and phenomenologically determined by*" the customer (Vargo and Lusch 2008, p7). Value has several meanings in the management literature but is most frequently defined from the supplier's perspective. For example, the customer value concept defines value as the economic worth to a firm of a customer, while the value-added concept allows sellers to think of bundles of attributes and seller-controlled variables (Woodruff and Flint 2006). Woodruff and Gardial (1996) have previously directed managers to consider the importance of understanding customer perceptions of value. However, it is only since the publication of the SDL that this area has been given widespread attention. While SDL highlights the significance of customer perceived value-in-use (or value-in-context, as per Vargo, Maglio and Akaka 2008), SDL neither defines this term nor proposes how it can be assessed. Building on Vargo and Lusch (2004, 2008) as well as Woodruff (1997) and Woodruff and Flint (2007), we define value-in-use as *a customer's functional and/or hedonic outcome, purpose or objective that is directly served through the product/service consumption* (Macdonald, Martinez and Wilson 2009). We propose that value-in-use may provide a missing link in assessing the customer perception of value in integrated goods-service offerings. Consistent with the SDL argument, a value-in-use perspective may be superior to the prevailing embedded value perspective which, building on the same authors, we define as: *the presence of product / service attributes, and performances against those attributes, for which the customer is prepared to pay*.

As servitization - the process of moving towards a product-service system, or as we would prefer to re-coin it for precision, a goods-service system - pervades manufacturing, suppliers are challenged to assess customer perceived value for integrated product-service systems (PSS). We follow Baines et al. (2007) in defining a goods-service system (PSS) as an integrated goods and service offering that delivers value-in-use. Fifty-eight percent of US manufacturers operate a combined service-manufacturing model, and this approach is growing across other Western nations (Neely 2007). Servitization is occurring across many business sectors and has implications across all organizational functions. For instance, in marketing this change has been heralded by an increased focus on services marketing, relationship marketing and experience marketing, and has seen a shift from the supplier

perspective - and the means of production - to a customer perspective and a focus on utilization (Gummesson 1995). The necessity of changing business practices as a result of this paradigm shift has been brought to widespread attention by Vargo and Lusch (2004). They highlight that a move away from a goods-centric logic to SDL not only means recognising the customer's contribution as a co-creator of value but also requires a change in how organizations understand the value derived by customers.

This shift has implications for a huge range of organizations which offer hybrid goods-service offerings, including: (1) manufacturing organizations which have adopted a servitized approach in order to remain competitive or to move higher up the industry value chain, such as Rolls-Royce which has successfully shifted to a fully servitized model by offering airplane engines on the basis of "power by the hour"; and (2) service organizations who provide servitized offerings that include physical components supplied by other organizations, such as telecommunications providers who work with handset manufacturers.

This paper examines some of the challenges in assessing value-in-use and proposes a new framework for assessment of perceived value of hybrid product-service offerings. It then presents a case study which provides some initial validation and refinement of our proposed new framework for value-in-use assessment. Implications for managers and for future research are provided.

2. Assessing customer perceived value of goods –service systems

Although the potential of value-in-use as a measure of customer perceived quality is widely recognised conceptually, we don't yet know how to operationalise it as a means for assessing the perceived excellence or superiority (to use Zeithaml's 1988 definition of quality) of a product-service. In working towards this goal we can look to existing measures of product/service quality used in goods, services and solutions contexts.

For goods, assessment of quality has become increasingly straightforward as long being a focus of engineering management. Product quality can be assessed through evaluation of engineering/production standards and customer perceptions of product attributes. However, for services, assessment of quality continues to be a challenge. For pure services, ServQual dominates as a measure of conformance to customer expectations (Zeithaml, Berry and Parasuraman 1996). ServQual was a ground-breaking measure because of its recognition that service quality is perceptual and occurs in interaction between customer and supplier (Parasuraman, Zeithaml and Berry 1988). However, despite its evident contribution as a means for assessing company-controlled processes, a limitation of the ServQual approach is that it does not assess *customer* processes in the creation of value, including product/service usage, experience co-creation and network interaction (including peer-to-peer communication). Hence we argue that ServQual is essentially an embedded-value measure. Partly because of these limitations, ServQual has been modified in some sectors: for instance, Kettinger and Lee (1994) combined two dimensions of ServQual with the *User Satisfaction with Information Services* (USISF) measure to obtain a more effective measure of the quality of the information systems function.

Generally the marketing literature has treated service quality and satisfaction as distinct but related concepts, with service quality as an antecedent to satisfaction (Bolton and Drew 1991; Kettinger and Lee 1994). In practice, satisfaction surveys are frequently used to measure of the outcome of product/service quality. However, high levels of customer satisfaction do not necessarily translate to behavioural loyalty. For instance Chitturi, Raghunathan and Mahajan (2008) cite several studies which show that more than 60% of customers who switch to another brand would classify themselves as "satisfied" with the original brand. If satisfaction is not a good indicator of customer behavioural loyalty then perhaps there are other, better measures of customer perceptions of value.

One promising area for extending the service quality-satisfaction model is around the notion of relationship quality, which under close inspection relates closely to the notion of value-in-use. In addition to assessing the quality of their product and service delivery processes, organizations can and do make judgements about the quality of their customer relationships (for example Storbacka, Strandvik and Gronroos 1995). In the solutions-selling literature there is a well-documented gap between customers' and providers' perceptions of quality. This gap may be explained by differences in how customers and providers tend to view solutions (Tuli, Kohli and Bharadwaj 2007). Providers, and indeed academics, tend to take a product-centric view of customer solutions, defining a customer solution as a customized and integrated combination of goods and services for meeting a customer's business needs. By contrast, Tuli, Kohli and Bharadwaj (2007) find that customers tend to have a *relational process* view of solutions and emphasise stages in solution delivery. Tuli et al. found that customers tend to view a customized and integrated bundle of products as only part of the solution, and not even the most frequently mentioned part. This finding of a mismatch between customers and suppliers in understanding the meaning of a solution helps explain customers' perception of suppliers' inattention to the relational processes of both requirements definition and post-deployment support. Given that these relational processes concern firstly the very definition of the customer's needs in the 'requirements definition' and secondly recognising the importance of assisting the customer's usage experience through 'post deployment support', it is not surprising that customers are all too often disgruntled. This perceptual gap further supports the argument for better tools to understand customers' needs matched to their in-use experience.
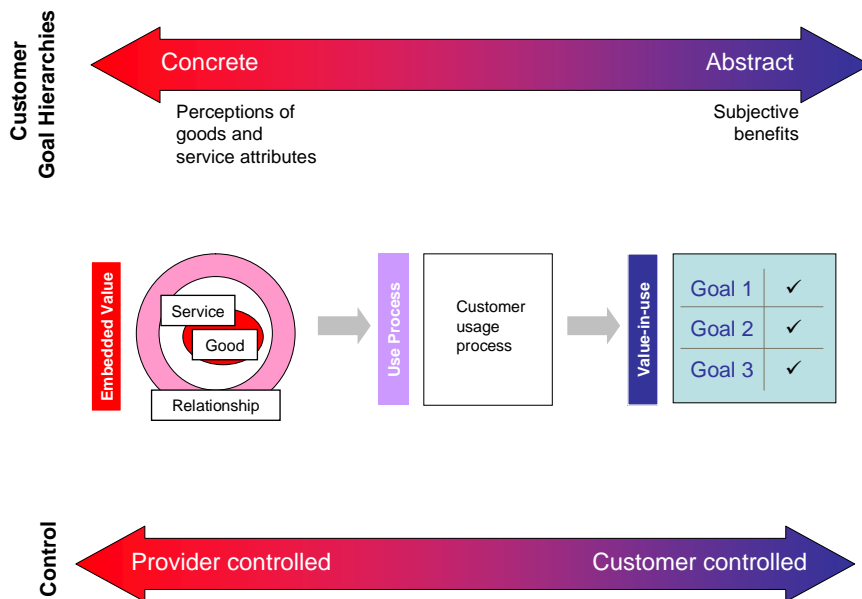
We argue, then, that where there are existing measures of customer perceived quality, these generally assess what the firm does (ie. embedded value) as opposed to what the customer experiences and co-creates (ie. value-in-use). Both the gap between customer satisfaction surveys and customer behaviour on the one hand, and the mismatch in perceptions between customers and providers of solutions on the other, indicate a need for new measures of customer-perceived quality. These new measures should build on the existing measures of supplier-controlled attributes - product quality, service quality, relationship quality - and supplement them with new value-in-use measures which may include assessment of the product/service usage experience, interaction quality and network (or peer-to-peer) quality. Building on the existing supplier-controlled measures is important, because, as emphasised by Vargo and Lusch, the SDL does not imply that "*once the enterprise has made a value proposition, it is finished with its part of the value-creation process…Rather…the enterprise cannot unilaterally create and/or deliver value*" (Vargo and Lusch 2008,

p8). We next present our framework for assessing customer-perceived value-in-use of product-service systems.

3. A framework for assessing value-in-use

We now propose our new framework for assessment of value-in-use (Figure 1).

Figure 1: Assessing the value-in-use of integrated product-services

Vargo and Lusch's (2004) call to view goods and services as 'appliances' for value delivery has been echoed in the co-creation work of Payne, Storbacka and Frow (2008) who reiterate that goods and services should be viewed as flexible processes, not static entities. This notion - in combination with our definition of value-in-use (see page 1) – leads to a perspective of goods and services as *flexible appliances for meeting customer purposes* and implies that customers' use of goods and services is goal-directed. In a review of customer behaviour, Bagozzi (1997) observed that the transaction-related processes of *buying* and *selling* are often goal-directed behaviours. However the SDL perspective brings to the forefront the importance of *usage*. The usage process should also be viewed as a purposeful, goal-directed behaviour which like product-, service- and relationship-quality, should be assessed for customer perceived value.

Means-end laddering theory (e.g. Kelly 1963; Gutman 1982) tells us that individuals have networks of goals comprising multiple levels. Individuals have goals regarding their own actions and goals regarding the outcomes of their actions (Gutman 1997). Consistent with their ladders of personal goals, individuals view supplier offerings from different perspectives across a hierarchy of goals which range from concrete to abstract (Peterman 1997). Peterman (1997) tells us that customers hold multiple levels of consumption knowledge from least to most abstract across the following range of goals: (a) beliefs that relate to physical product features or service attributes, (b) subjective benefits, and (c) consistencies with personal values (Peterman 1997).

The implication of goal theory for value assessment is that suppliers cannot assume that customers' value assessments are made at a single level nor with regards to concrete product/service attributes. Suppliers must also allow for assessments made at multiple levels and at increasing levels of abstraction including at the level of subjective benefits and, potentially, even at the more abstract personal values level.

Goal theory helps to explain some of the gap in understanding between customers and suppliers of integrated goods-services offerings (Paulssen and Bagozzi 2006). This gap occurs because of suppliers' failure to recognise the importance of customer value perceptions at multiple levels of abstraction and, particularly, the importance of abstract customer goals. Suppliers' assessment of value has tended to be 'attribute centric' focusing at the concrete end of the hierarchy, due to the goods-dominant logic assumption that all value creation occurs on the supplier side. Importantly, we have argued that the notion of service quality is equally obsessed with what the supplier delivers, as opposed to the value the customer gets. Insufficient effort has been put into specifying how customers select and strive for goals (Bagozzi 1997). However, in order to effectively evaluate customer assessment of value-in-use of integrated goods-services offerings, customer perceptions need to be measured *up* as well as down the hierarchy of customer goals, and matched to customer perceived benefits.

Our framework for assessment of value-in-use takes direction from these hierarchical goal perspectives. Customers may evaluate the quality of a product-service system at an embedded value level (which, as a reminder, we previously defined as *the presence of product/service attributes, and performances against those attributes, for which the customer is prepared to pay*) or at a value-in-use level (which we previously defined as *a customer's functional outcome, purpose or objective that is directly served through the product/service consumption*): indeed, their goal hierarchy will also include a mental model as to how these levels relate to each other.

Despite the array of techniques available for assessing product, service and relationship quality, our empirical research (on which we provide an initial report below) suggests a desperate need amongst managers for more holistic customer insight measures. The embedded value perspective is inadequate for explaining the role of customers in deploying their own resources in creative ways to derive value-in-use from a firm's package of services that varies from that intended by the firm (Arnould, Price and Malshe 2006) and it is not consistent with an increasing shift amongst practitioners and academics towards a continuous-process perspective where the customer's role as co-creator is recognised (Vargo and Lusch 2004).

3.1 Assessing usage process quality
From a customer perspective, assessment of perceived quality is an important contributor to consumption learning and a determinant of satisfaction and future behaviour. From a provider perspective, perceived quality is an important performance measure for management control and decision-making including the pricing decision. This is significant because for many product-service hybrids, pricing is often "finger-in-the-air" in the absence of any better understanding of the value being delivered (Eisenhardt 1989). Our framework suggests that assessment of the usage process is as important as assessing supplier-embedded value in products, services or relationships. These processes all contribute to the customer achieving value-in-use. The usage process includes those processes where the customer co-

creates value through interaction with the firm, its product/services or with other customers, the latter often occurring outside the influence of the firm. It is unclear why these forms of assessment are not used more by practitioners especially as goal theory tells us that customers are capable of articulating their goals and their assessments of quality (i.e. superiority or excellence) at multiple levels between concrete and abstract. So, we argue that use process quality – its perceived excellence or superiority – both exists conceptually and can be empirically elucidated.

4. Methodology

In order to provide initial validation of our proposed framework, an exploratory study was conducted in a single dyad in a business-to-business context. Members of the dyad in an outsourced maintenance, integrated goods-service system context were interviewed. The *customer* is a large UK-based manufacturer of industrial equipment. The *provider* is a supplier of integrated maintenance goods and services to manufacturers. The product-service system of interest includes a fully outsourced and managed maintenance program. The outsourced maintenance program allows the provider to push their own-branded products but has a proportionally greater emphasis on procurement and management of third party services from multiple suppliers. The product-service system includes a service professional located full-time at the customer site. Eight members of the customer 'buying group' were interviewed including four 'users' of the service and four senior managers who acted as 'decision-makers'. On the supplier side, interviews were conducted with the bid manager and with the head of services. Exploratory semi-structured, depth interviews were conducted individually with each respondent on site between February to April 2009.

5. Co-located outsourced maintenance: An integrated goods-service system case study

We first provide a discursive exposition of the case study data, telling the story of the maintenance service and how its value was perceived. We then structure the customer's assessment of value which emerges through this story, using coding which evolved from Figure 1, while being open to modifications in order to fit the data: see Figures 2 and 3.

5.1 The introduction of the outsourced maintenance goods-service system
The customer organisation has a proud heritage in manufacturing industrial equipment in the UK. It has a strong corporate culture with an empowered and committed workforce. Senior managers proudly claim 80% engagement from staff in employee engagement surveys. Five years ago the senior managers in the customer organisation started talking about outsourcing the maintenance function. The maintenance and repairs function plays an essential role in keeping the production lines going, yet at the time, maintenance on-site was completely unstructured. Reflecting back on that period, the managers we spoke with variously described maintenance as *"challenging"*, *"awful"* and *"dreadful"*. However, they had struggled for several years with how to deal with it. One senior manager reported that maintenance had in turn *"been centralized, decentralized, it had been under its own individual leadership, it had been under different area leadership and it was pretty grim."* This meant that breakdowns were common and some machine lines were achieving 35% overall equipment effectiveness (OEE) - *"and that's just outrageous"*. Another senior

manager reported that maintenance was "*in excess of 90% reactive*" yet staff thought they were doing an effective job because they were good at "*fire fighting*".

Managers however were concerned about the lack of planning: "*nobody ever sat back and thought about how you do this, what are the processes and all the rest of it*". They were worried by the amount of time supervisors spent fire fighting instead of managing people, improving efficiency, and implementing TPM (total productive maintenance) processes. One study had shown that supervisors were spending 34% of their time on the tasks of chasing suppliers, ringing round trying to get quotations, chasing parts, sending people out, and very little time on "*the preventative stuff, the visionary stuff, trying to do the planning, the preparation and delivering projects. They were spending 34% of wasted time.*"

Having recognised the need to take a more proactive approach to maintenance the firm engaged the services of an external provider to manage maintenance at its largest site. The chosen provider is traditionally a manufacturer / supplier of factory equipment; however, it also provides a combined product-service solution which includes sourcing, supplying and repairing its own brand as well as third party products. Part of the service includes a permanent on-site service professional to oversee and implement the management of repairs and maintenance.

Once the program was in place, the customer found that introducing a formal maintenance program had highlighted problems elsewhere in the business. Managers found that their stores were disorganised and inefficient: "*You would go into the store and you wouldn't know which was a good part, which was a bad part, what had been used, what hadn't been used. It was like a scrap yard and so we were throwing good stuff away because we didn't know that it worked. We were trying to repair machines with bits that were broken.*"

For example, the customer had stores in each of the four factories on the site but no communications between stores to allow sharing of stock. The lack of a 20p bearing can stop a million pound machine, yet: "*we didn't know what spares we had got, people had got their own squirrel stores in their cupboards, we were stopping machines overnight because we had got a breakdown, we didn't have the spares for it and then the guy would come in from holiday and say, oh, I've got twenty of those in my cupboard…We were flying parts from all over the world and we had got them and we didn't know. It was a disaster.*"

Another manager reported how he felt after discovering that there was an engine part in store after he had been waiting a week for a replacement part to arrive*: "of course it makes you want to kill somebody!"*

The managers considered several maintenance providers but only one offered to place a permanent service professional on-site. Being located on site, the service professional would be able to note the key location of items and if the customer had a breakdown, they would know where the critical machines were. Additionally, because of the provider's size and global reach it was hoped that it would bring a "*full size inventory*" of parts and repairs. The managers expected that the provider organisation's "*market clout*" would be advantageous for sourcing the best prices and the procurement of parts. There was also an expectation that the service professional

would consult on managing obsolesce: for instance, if there was a twenty-year-old part that could no longer be sourced, it was expected that the service professional would make recommendations for re-designing the processes using currently available components.

The provider would be supplying and repairing its own and third party components. Managers recognised that the provider would use its position to push its own branded products. They seemed to accept this as reasonable practice: "*obviously they were trying to sell [their own brands] but we saw that and we knew that was coming*".

5.2 Immediate impacts

The managers initially expected to use the provider's service in limited ways but almost immediately found they were using it a great deal more than expected. The convenience of having someone else deal with repairs soon caught on. "*So all the technical coordinator would do is just give the broken bit – motor, pump, gearbox – to the* [service professional], *and* [he] *would organize to get it fixed. So that then gave the technical coordinators lots of time. They could get out of their offices, they could start talking to the maintenance guys. It was like, I guess, just a snowball effect and I have got some photos that I can show you – so much happened.*"

Instead of days, repairs were taking only ten minutes of factory managers' time. Another senior manager reported on the immediate and visible impact of giving the factory supervisors more time. "*It suddenly freed up all the guys and it was great, so from a manager's point of view you saw these people suddenly having more time and that enabled us to then start talking about the things that we should be doing upstream to get TPM [Total Preventative Maintenance] sorted out and to start TPM processes which then has a beneficial effect of improving and requiring less repairs in the first place and so on and so forth*".

In addition to implementing a maintenance program and shifting the burden of repairs from supervisors, the outsourced stores management program realised some real benefits. "*We found something like six – I think it was 1.2 million dollars worth of obsolete stock that was just rubbish that we had got around the place – in cupboards, under desks. We found more than that, I think it was almost 2 million dollars worth of stuff that we didn't know we could use that were just in squirrel stores, in people's lockers and stuff.*"

5.3 The customers' role in co-creating value

As well as outsourcing maintenance, the customer organisation contributed to improved performance on-site through the introduction of new TPM processes and training. This saw staff trained in the use of more regular and proactive - rather than reactive -maintenance processes. Staff were also trained in the use of the stores, which were brought under control of the outsourced maintenance provider who bar-coded all items. The improvement in the stores was "*fantastic*".

The success of the new approach depended on the customer organisation taking responsibility for improvements as well. For instance, one senior manager said he vividly remembered a conversation with one of his factory managers. The factory manager was "*demotivated*" because he felt no one was listening to his needs. When challenged, the factory manager complained that he needed £140,000 in spare parts to

make his section perform better. The senior manager approved the bulk purchase which shocked the factory manager who "*after he had picked himself up off the floor*" was told the conditions of the purchase: "*Here's the deal, I will buy you this stuff, I expect you to look after it, maintain it, get it in the stores, label it.*" The improvements in that section were dramatic, going from 35% OEE to 85% OEE. The result is that the area is now "*a hell of a machine tool line, it's now doing 85% OEE – every day currently, every single day.*"

Managers in the customer organisation also recognised their company's contributing role in looking after the machines provided by its original equipment manufacturers (OEM) and in working with the OEMs to maintain them. A manager relayed that when he was tryiing to call out an OEM for on-site repairs: "*I very rapidly realized that we had got an obligation to [the OEM], it's not just about them being a supplier to us, we have actually got an obligation to look after their kit because they have got a reputation as well. Again it was about educating the guys on the deck that this is a two way street here, you want [OEM] here, but [the OEM service professional] wants to walk into a machine that is clean and we have got spares and it's not like a doss house and he wants to talk to someone that wants to be interested.*"

A key component in the initial success of the outsourced maintenance service was working closely with the provider's service professional: "*I didn't treat him as a service provider, I treated him as one of my team. He sat in the same office with my first line. Every day he spoke to them. If there was a problem I would go and talk to him, the same as I would talk to one of my line guys. He came to our team meetings, he was part of my extended team.*" The closeness of these particular individuals has continued despite the service professional and several of the managers moving onto different roles in the past couple of years.

5.4 Importance of the individual service provider
It became clear to the managers very early into the use of the outsourced service that the individual service professional was important: "*One of the benefits ... that became obvious to us, we had a great guy [name] doing the job*". The contrast between the service provided by this original service professional and his subsequent replacement has further highlighted the importance of the individual personnel. The original service professional seemed to work very well with senior managers and developed a good relationship with factory floor supervisors. He was widely respected for being "*on the ball with most things*" and as working "*insane*" hours to ensure success.

Several comments were made by both decision makers and users about the contrast in service quality since the original service professional had moved on to a more senior position. It was widely observed that the replacement professional appeared to be less responsive and less knowledgeable. One senior manager observed that "*they [provider] lack ... somebody with the knowledge of [original service professional]…We've had some real sagas.*" A senior manager who has championed the outsourced maintenance service used the word "*worried*" four times when talking about the change in key personnel: "*He [original service professional] is still on site at the moment, but he is about to take on more responsibility and we will see him less. And that worries me.*"; "*That worries me because…you can argue…that it is not the people who make things work, it's the processes, but you need good people to make the processes work*"; "*We have become a little bit complacent because maybe the*

processes aren't as good or robust or the KPIs aren't as good or robust as they should be...we have perhaps let this die a little bit and that worries me a bit"; and the manager appeared to want reassurance from the provider organisation so that *"when [*original service professional*] moves on, I am not worried and I am still seeing the numbers, I am still seeing that KPIs and I am still convinced that I am getting the best deal from [*provider*] rather than doing it myself".*

Users also made comments about the contrast in service between the individual service professionals. In the past: *"That was when* [name] *was doing the* [outsourced maintenance service] *and everything worked very nicely".* The replacement service professional was criticised by one of the factory floor managers for not understanding the user's definition of urgency: *"When I say something is urgent I expect a courier now to get the part and take it away".* There were complaints from users that they were having to do more chasing-up since the new service professional started in the role. A problem which caused recent surprise and consternation involved parts being returned after being sent out for repair - and they had not been properly repaired. This caused delays while technicians fitted and then were required to immediately remove defective replacement parts.

5.5 Assessing the value of outsourced maintenance
Senior managers now believed they had *"turned around"* maintenance through introducing TPM and outsourcing maintenance management. However it is difficult for them to assess which were the main contributing factors for these improvements as indicated by the following quotation from one senior manager: *"I'm not sure whether this improvement is the result of good planning or just emerged".*

Additionally, following the initial massive turnaround in maintenance/stores effectiveness, senior managers observed that it was difficult for the customer to detect the incremental value from the outsourced maintenance service. One senior manager who had been originally a champion of outsourced maintenance commented that: *"generally, it's a system that's working away and it's bubbling along at a level that I just don't see anymore".* It appears that the provider may have been becoming a victim of its success and was finding it harder now to demonstrate value. In addition, several changes in key personnel had compounded this difficulty including: (a) senior managers within the customer had moved into different roles away from maintenance; (b) as noted earlier, the original service professional had been promoted and had been replaced; and (c) the current service professional was no longer co-located with the customer's management team but sat in his own space on site, which meant that he - and consequently the provider organisation - was at risk of being disconnected from the everyday concerns of the customer's business.

The standard by which the provider was assessed had shifted upwards as a result of the initial success of the service. One senior manager reported that the provider was *"good at the mundane, rudimentary, tick-over stuff but not good at innovation".* There was also a concern that having become established on-site and within the customer's business that the provider had *"relaxed"* and lost *"passion".* This comment from another senior manager (previously a champion of the outsourced service) reflected the current view of the provider: *"Do I see them as such a valued asset? Probably not at the moment. I still see them as providing us with a good service, having a guy on site but probably the focus has gone a little bit away, I*

*believe that [*the provider*] now probably have taken it that it's a given thing that they'll be on site here, probably the emphasis has gone away from providing such a quality service to be honest*".

Having made a big impact originally, the provider appeared to be struggling to demonstrate the value of its service. There were several complaints that the provider should be making their impact more explicit through reporting, as indicated in the following comments from four separate interviews: (1) "*As a service provider…I think they should be telling us what they are doing for us rather than us asking*"; (2) they should be: "*demonstrating the value and margin*"; (3) they should be "*providing more quantitative measures of the services they offer*"; and (4) "*I've got problems with the transparency on the reporting and things*". The current state of the relationship indicated some mistrust about the commitment of the provider to meeting the customer's needs. The current relationship was described as "*OK, but not great*".

There was also a recognition that the customer needed to do its part in extracting value from the arrangement. One senior manager observed that the organisation had weaknesses in providing information to the provider that was useful to their processes, such as predicted breakdowns and production forecasting. In addition, several senior managers and floor managers believed they should be conducting their own regular assessment of the value of the service. "*If you were to ask me now what the relative value of [the service provider] was, versus me doing it myself, I am not sure because I think we have lost our way a little bit in terms of that quantitative analysis.*" This concern about the value of the outsourced maintenance service had intensified in recent times as the global recession saw a reduction in outputs. At the factory floor there was some resentment from users of the service who – bearing the direct brunt of any failures in the maintenance service and potentially feeling their jobs at risk– were asking why this work shouldn't be brought back in-house so that they could do it themselves.

There was also the recognition that while outsourced maintenance had helped to streamline the process, it had not been without some sacrifice. There had been some loss in terms of knowledge and expertise within the customer organisation as indicated by the following quotation: During "*the three odd years that this system has been in place, we've lost track of how much these repairs would cost us in the open market if we went outside with [*our*] buying power*". And it had also meant that communication was less direct and "*less local*". One senior manager reported that there was: "*confusion even amongst myself now of what that process has now become, it seems to become less efficient somehow, things are getting lost, things are taking longer to get the feedback I get, quotes take longer to come in and the technical aspects somehow are getting lost because of the number of people that we're having to speak to, the communication channels are longer which inevitably you get almost Chinese whispers don't you.*"

5.6 Customer articulation of quality and value-in-use
From interviews with individuals from both the customer and provider organisation the changing nature of value-in-use became clear. Two separate quality assessments of the outsourced maintenance product-service system were derived from these interviews: the first was in Year 1 of the engagement during what the sales manager in the provider referred to as the "honeymoon" period (Figure 2); the second was at Year

4 of the engagement after several changes in personnel and compounded by an economic recession (Figure 3).

Our analysis of customer perceptions of quality and value identified that customers can - independently and without prompting - articulate their quality perceptions of product quality, service quality (including at the provider organisation and individual service professional level) and relationship quality (again at the levels of organisation and individual). An emergent construct from the data was that customers also assess the network quality of the provider, i.e. the provider's strength in accessing and making use of other suppliers.

Additionally, customers evaluate their own usage process quality. There was greater emphasis on usage process quality longer into the relationship, i.e. more emphasis after 4 years (Figure 3) than in the first year (Figure 2). This may imply that as the customer becomes more experienced with the product-service system, they take a more active role in co-creation. We noted that most of the customer comments about usage quality at Year 4 related negatively to the provider; thus, the greater emphasis on usage quality may be as a result of dissatisfaction with the product-service. In this particular case the dissatisfaction may be due to having lost the honeymoon "glow" (the reason give by the provider sales manager) or due to a genuine deterioration in quality standards delivered by the service provider (as suggested by several of the users we interviewed).

Finally, our data showed that customers do assess the value-in-use and can articulate it, both at a corporate level and at an individual level. Not surprisingly, corporate level evaluations of value-in-use were predominantly made by decision makers, while users tended to assess value-in-use at an individual level. In the case study, both types of value-in-use were important. One of the senior managers said he made his decisions after *talking* with the factory floor managers (i.e. the users) and all of the senior managers talked about evaluating the value-in-use following the *observed* impact on the factory floor.

5.7 Moving from preventative to promotional goals
Customers' goals change at different stages of the relationship and affect their evaluations of value. Activities that might have initially led to high levels of satisfaction may later be considered 'just a given' at subsequent stages of the relationship. This is consistent with lessons from research on the relationship between benefits and post-consumption feelings. Given that avoiding pain is a necessity and that seeking pleasure is a relative luxury, customers initially give higher priority to utilitarian benefits than to hedonic benefits (Chitturi et al. 2008, p50). This means that customers seek to initially "*eliminate the points of pain*" (Keiningham and Vavra 2001, p176) by meeting prevention goals (such as confidence and security) through utilitarian benefits. However, once the prevention goals are met, the "principle of hedonic dominance" (Chitturi et al 2008, p50) motivates customers to focus more on the continued fulfilment of promotion goals through hedonic benefits (Chitturi et al. 2007).

Once prevention goals are satisfied, customers tend to "then listen to their desires" (Keiningham and Vavra 2001, in Chitturi et al. 2008 p.60). At this point the supplier's focus should be on customer delight which is not directly influenced by

either prevention emotions or by satisfaction. At this point it means a provider should be focusing on the promotion benefits that will lead to feelings of excitement and cheerfulness. In the case study, with the maintenance services provided we find that the supplier has done well in satisfying the prevention goals, but not so well in recognising the customer's switch to a focus on promotion goals. This is illustrated by the following sequence of quotations from an interview with a senior manager on the customer side:

> "*Previously we were unorganised…Maintenance was in excess of 90% reactive…It was dreadful.*"

The new service was introduced:
> "*to get good control over our stores and planning and the reactive maintenance side.*"

The manager appears to acknowledge that the preventative goal has been met:
> "*We have now turned around the maintenance…We achieved great improvements through these two changes.*

However while the utilitarian goals appear to have ben meet, the principle of hedonic dominance would appear to have taken priority. The customer complains that the supplier is:
> "*good at the mundane, rudimentary, tick-over stuff but they are not sufficiently good at innovation.*"

He complains about their lack of "passion". He now appears to demonstrate a strong need for promotion benefits which will lead to delight:
> "*They are not hungry enough. They should kick down the door and dazzle me. Am I unreasonable? No, I am demanding.*"

These findings are consistent with the conceptualisation provided by Payne, Storbacka and Frow (2008) that (a) each and every encounter between the customer and supplier is important, (b) together these encounters make a cumulative contribution to co-created value, (c) organisations require a long-term perspective of customer relationships, (d) this also implies a revision of the traditional planning cycle to take account of differing relationships. Communication and value propositions need to change to reflect the length and history of the relationship. Long-term customers need a totally different communication scheme to short term customers.

Figure 2: Customer perceptions of quality and value (Year 1)

PRODUCT QUALITY		USAGE PROCESS		VALUE-IN-USE

PRODUCT QUALITY
- Warranty maximisation (U3)
- Finding obsolete items (D7)

SERVICE QUALITY
- Single point of contact (not 300) (U3)
- New suppliers online (U1)
- Do the fiddly stuff (U2, D7)
- Deal with difficult suppliers (D7)
- Get suppliers to work together (U3)
- Responsiveness (D4)

SERVICE PROFESSIONAL
- Working daft hours (D5)
- Very experienced (D5)
- When X was in the role, everything worked nicely (U3)

- **RELATIONSHIP QUALITY**

SERVICE PROFESSIONAL
- A great guy (D5); A great relationship with him (D4)
- Worked closely at a senior level (D5)
- Treated him as one of our team (D7).
- He was co-located with our guys (D7)
- He is trusted (D4)

ORGANISATION:
- It's a 2-way relationship: we buy their stuff and they help our performance (D7)
- Management team stay in touch (D8)

- **NETWORK QUALITY**
- Getting suppliers to cooperate with each other (U3)
- Their supply base gives us clout (D7)

USAGE PROCESS

Very easy – simply spend ten minutes logging in the part with the provider – and that is it. (U3, D7)

It's a two-way street with equipment suppliers. We need to maintain the machines well if we want them to help us (D7)

Manager will purchase new stock on condition that staff label and store it properly (D7)

Treated [the service professional] as part of my team. He sat in the same office with my guys. (D7)

VALUE-IN-USE

TO THE BUSINESS
- The value can be seen in the supply of major components to schedule, on time and the quality of standards expected.(D5)
- Improved operating efficiency (35% to 85%) (D7)
- Help to get us under control. (D4, D7)
- Allow us to focus on forward planning (U8)
- Frees up supervisors' time – for planning and HR (U1, U2, U3, D5, D7, U8)
- Realise the value of our assets. (D5, D7)
- Found $1M in obsolete stock (D5)
- Found $2M equipment in various stores (D5)

TO THE INDIVIDUAL
- Frees up my time (U1, U2, U3, U8)
- Makes my life easy (U1.U2)
- Not my problem (U1, U3)
- Someone to blame (U1)
- Get rid of "red tape activities" (U2)
- Save days in negotiation(U3)
- Save days chasing parts (U3)

Figure 3: Customer perceptions of quality and value (Year 4)

PRODUCT QUALITY

- Don't give details of warranty issues anymore (D5).

SERVICE QUALITY

- Unsure of the quality of repairs. (U2, U3)
- Stores are not looked after (U8)
- They don't understand what we mean by urgent (U1)
- Show us evidence of service recovery and service improvement (D6)
- New service professional is less responsive (D4) and lacks knowledge (D5)
- Am worried about what will happen when original service professional moves on (D7)
- Should be innovative; should make things happen (D6)
- Putting their goals ahead of the customer's goals (D6)
- Should give us details on the repairs that have been done (U3, U8)

RELATIONSHIP QUALITY

- Current relationship is 'ok' but not great (D4)
- They should do a better job of telling us what they are doing for us. (D7, D6)
- Want them to keep amazing me (D6)
- Want more transparency, more openness (D5, D6)
- The provider's management team doesn't bother to contact us anymore (U8)

NETWORK QUALITY

- Not sure if they have got the breadth of coverage of suppliers that they need to have (D5)

⇨

USAGE PROCESS

- We often have to chase stuff up with them which I don't want to do (U1)
- We have lost our way in terms of quantitative analysis of the service. (D7)
- We are paying for our own stores audits because we have lost confidence (U8)
- I want them to show us 3 quotes and their margin (U8)
- It has become too easy and made us lazy. (U1, U2)
- We are not conducting 10% pricing audits anymore (D4, D7)
- Communication is unclear, things are getting lost, there are 'Chinese whispers' as communication chain has gotten longer (D7).
- We are not good at sharing information with the supplier. Our reports are in the wrong format or do not have the necessary data (D4)

⇨

VALUE-IN-USE

- Parts coming back unrepaired cause us more work. (U2)
- Poor management of stores could potentially stop a line (U8)
- In the last year we haven't stopped the track once (D5)
- Unsure of the value (D7)
- We have lost touch with market prices (D5)

7. Summary

This paper presents our new conceptual framework for assessment of value-in-use. This framework proposes that customer value can unearthed by assessing: (a) customer assessment of embedded value, i.e. product quality, service quality, relationship quality, and the emergent construct of network quality; (b) customer assessment of customer usage process quality; and (c) value-in-use. This is followed by an application of this framework in an exploratory study in the context of an outsourced maintenance product-service system.

Based on our conceptualisation and findings from the exploratory study, we make the following propositions:

Proposition 1: Existing measures of quality assess embedded value, not customer co-created value.
Service quality, in particular, has as much an emphasis on value as delivered at the moment of exchange as does product quality.

Proposition 2: The usage process can be subjected to quality assessment.
Our study showed that customers can and (spontaneously) do articulate not just the nature of the usage process but its perceived excellence or superiority – that is, its quality.

Proposition 3: Value-in-use can be assessed.
Satisfaction is a shallow, uni-dimensional measure of customer perceived value and is all too often a poor predictor of behaviour and firm performance. By contrast, our framework for assessing value-in-use is multi-dimensional and includes provider supplied and customer co-created sources of value. It also gets much closer to the customer by linking directly to the customer's goals. Because it links to goals, our framework is much more personal and recognises the individual nature of value-in-use. However, as the empirical data demonstrates, our framework also has application when understanding value-in-use at a corporate level, by recognising that corporations are made up of co-creating, value-seeking individuals, who perceive the achievement of individual goals as well as corporate ones. As with usage process quality, customers can and – provided not prompted by an excessively narrow question about the value 'delivered by' the supplier - spontaneously do articulate their goals, purposes or objectives, the extent to which these are co-created with the supplier, and the goal hierarchy by which this value-in-use derives from supplier and customer process quality.

Proposition 4: Value-in-use changes as customer goals evolve.
Value-in-use changes by definition depending on the customer's goals (as indicated in our definition of value-in-use). The proposition is, however, also supported by the data which clearly shows a customer's assessment of value-in-use changing as the corporate and individual goals shift from preventative to promotional (see Section 5.6, and in particular contrast Figure 2 with Figure 3).

8. Implications

Our interviews with customers and providers have shown that they are both looking to understand how to assess the value in integrated product-service systems. Both sides are dissatisfied with existing measures. We propose that by surfacing the usage process quality and the value-in-use – and not just service quality which is what practitioners, like scholars, currently tend to focus on –we can give both sides much greater clarity on customer perceived value. For the provider this clearly has implications for pricing, promoting and delivering product-service systems. And for the customer this clarity will assist them in assessing the cost-benefit trade-off for product-service systems such as outsourced maintenance.

As Vargo and Lusch have argued and our data makes plain, value-in-use is highly context specific. Although service quality has many commonalities across contexts, the same seems therefore unlikely to be the case – at least to the same extent – with value-in-use. Each context, therefore, is likely to require qualitative exploration. Our study suggests that this is perfectly feasible, and provides in particular the insight that in a B2B context multiple respondents are needed in order to assess value-in-use at individual as well as organizational level; studies in other contexts – sectors, product/service categories, marketing archetypes, hedonic versus utilitarian value emphases and so on – are needed. There seems to be no reason why such qualitative work should not be followed by quantitative assessment of value perceptions, their antecedents such as the quality of products, services, relationships and usage processes, and their consequences. We hope to contribute here in our next stage of research within the business-to-business product-service system context.

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