Understanding the use value dimensions of outsourced maintenance services

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Understanding the Use Value Dimensions of Outsourced Maintenance Services

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Abstract. Surviving in long-term outsourced maintenance contracts in current financial situation necessitates better understanding of what customers attribute as value and its dimensions. This paper reports on findings from research undertaken with a supplier of automation products and services and its customers. Structured interviewing technique has been conducted in four customer companies from different industrial sectors at different organizational levels. Value dimensions and their role in different decision making levels are identified.

Keywords: Maintenance outsourcing, Use value, Repertory Grid

1 Introduction

In order to survive in the current global competitive environment, companies often follow either a differentiation strategy or a cost leadership strategy. As a differentiation strategy organisations may offer supplementary services related to existing manufactured products, or move to providing integrated bundles of products and services. Such a move entails "moving away from the transactional business imperative and offering more integrated and value adding services to their customers" [1]. This can result in sustainable profit margins higher than product sales [2].

The aim of this paper is to identify measures that constitute important dimensions in understanding the use value of maintenance services. In particular, the focus is on understanding how different stakeholders – end-users and decision-makers – assess such service offerings. The next section briefly evaluates the extant literature in relation to the outsourcing of maintenance services and the need to measure the use value of such offerings. This is followed by a brief description of the adopted research methodology and analysis of research technique used. The last two sections present the findings and discussion.

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2 Competitiveness through value-adding maintenance services

Greenough [3] highlights "the complex relationship between products and services is shifting and a larger component of added value offered to the customer is now being provided by services". In this respect, new concepts such as product-service offerings, bundles, integrated offerings, or Product- Service Systems (PSS) [4] have emerged in order to differentiate the market oriented value creation approach. Baines et al [5] define PSS as "An integrated product and service offering that delivers value-in-use" and the organization's shift toward this kind of offerings as servitization [6].

The global competitive environment not only leads product and service suppliers to innovate through offering product/service bundles, but also persuades customers to outsource their 'non-core' activities like maintenance to reduce risk. Those are activities where the risk of losing know-how by outsourcing them is low. Tsang [7] suggests the decision to outsource maintenance activities or retain maintenance doing it in-house is part of four strategic dimensions including: service delivery options, maintenance support infrastructure, maintenance organization and maintenance methodologies. In contrast to the strategic nature of maintenance, the decision whether to outsource maintenance services is typically made by single functions or individuals, whereas an effective outsourcing decision requires inputs from different organizational levels. As Stremersch et al [8] argue, the decision making units for full-service contracts are more heterogeneous and generally larger than conventional units for individual maintenance services. In this setting, Plant, Maintenance and Purchasing Managers would act as key players and the end-users as influencer.

3 Defining the *'use value'* for Maintenance Outsourcing

Formerly, the benefits of maintenance have mostly been considered as "avoiding the costs of failure" [9, 10]. Recently, it has been argued that maintenance has intrinsic value [10, 11] but existing "cost-centric" maintenance design methodologies still underestimate this essential value-adding dimension of maintenance [12]. Anderson and Narus [13] state that "many customers understand their own requirements but do not necessarily know what fulfilling those requirements is worth to them".

There is a need to assess the *use value* that customers attribute to products and services [14]. However, it is important first to define *'use value'*, in order to understand and contextualise from a servitization perspective. Anderson and Narus [13] define value in terms of the "monetary worth of the economic/social, technical, service and social benefits a customer receives in exchange for what it pays for a market offering". On the other hand, Zeithaml [15] defines value on the basis of benefits versus sacrifices. Parasuraman et al [16] expand on this by defining value on the basis of expectations versus performance. We argue, therefore, for the need to

understand the use value attributed by consumers of servitized offerings, rather than that which is perceived at the point of sale.

Of late, the emerging service-dominant logic has attracted much attention. In particular, from this perspective there is a need to understand *co-production* and *co-creation* with the customer. Basically, it is the customer that determines the use value from this perspective as an active participant in attributing within such a setting [17].

Much of the extant literature details the technical and financial benefits of maintenance [9, 10]. Current research also argues that there are elements of intangible values that are as important and effective in decision-making as tangible values [12]. A value assessment for maintenance outsourcing must facilitate the trade-off between cost-centric and value-centric approaches to enable a more effective decision making. Sweeney and Soutar [18] argue for the need to understand which value dimensions are important particularly in different levels of decision-making.

4 Research Methodology

An exploratory qualitative research approach is adopted. We undertook an in-depth case study research with a large multinational automation OEM. As part of its servitization strategy, it has a business stream specifically dedicated to managing the entire maintenance function for customers. This includes the entire automation equipment range – including products of third party manufacturers. This paper reports specifically on this part of the business and examines four different customer sites that have outsourced their maintenance activities.

The customer organisations were all manufacturers of equipment across a range of sectors: medical equipment, pharmaceutical manufacturer, insulation products and a coin manufacturer. The maintenance departments were all centralized. A representing engineer from the maintenance outsourcing supplier company is present on site who deals with technical and administrative aspects of the contract with the customer.

Along the lines advocated by Boyer and Swink [19], a range of methods have been used with the case organisation and its customers between 2009 and 2010 to develop a holistic understanding. These included archival data, semi-structured interviews, documentation and the repertory grid technique with customers of the case organisation. In this paper, we specifically report on the qualitative findings from the repertory grid study.

4.1 Repertory Grid technique

Repertory grid is an in-depth interviewing technique which is used to elicit the personal perceptions about an aspect or phenomena [20, 21]. The technique is

exploratory in nature, especially for situations where it is hard for interviewees to articulate the more tacit aspects, ideas and experiences with clarity [22]. The theory and its technique allow for an exploration of an individual's personal construction system and are grounded in George Kelly's [23] Personal Construct Theory (PCT). The technique enables the researcher to capture the cognitive mental map of how the respondent construes the world, through constantly comparing and contrasting the respondent interprets and re-interprets that which is important to them in their lives [23]. It allows for a deeper exploration of the subject matter whilst restricting interviewer bias.

The technique is used in an interview situation where the interviewee is asked to consider a phenomena or situation under study (for example, in this case maintenance and repair operations). In this study, the names of maintenance and repair suppliers are elicited and noted on postcards that are numbered. These are also noted on the grid (see Figure 1). In the next step, the elements (names of suppliers) are compared in triads using the post cards [21] by asking the question "Can you think of any ways in which two of these suppliers are similar to each other and different from the third in terms of the outcomes you get?" The response is captured as a construct in the words of the interviewee. The interviewee is also asked then to rate all the suppliers on a scale of 1 to 5. This process is then repeated using a randomised combination of triads until no more meaningful constructs can be elicited.

Efforts were made to access interviewees from different backgrounds and varying degrees of seniority within the respective customer organisations. Respondents included end-users and decision-makers within the customer organisations. In total, 32 repertory grid interviews were conducted, lasting between 45 and 90 minutes. All interviews were recorded and transcribed verbatim. The interviewees included both maintenance end-users (maintenance engineers, technicians, and operators) and decision-makers (procurement managers, engineering managers, finance managers).

..1..	1 Supplier A	2 Supplier B	3 Supplier C	4 Supplier D	5 Supplier E	6 Supplier F	..5..
1. Good quality of repairs	2	2	4	2	2	3	Poor quality of repairs
2. Being local	3	3	1	1	2	3	Distant
3. Specialist Knowledge	1	1	2	1	2	1	General Knowledge
…							…

Fig.1. excerpt of sample repertory grid

4.2 Analysis

Data analysis based on the interview transcripts and grids was conducted in the following steps based on the recommendations in the literature [24].

1. *Initial Coding (Categorisation) Process*: all the individual constructs elicited across all the interviews were listed on to 3x3 inch cards including the names of the construct and the counter pole; the company name; the code identifying the company; interview number and construct number; the name of the participant; and lastly, the description/quote describing the meaning of the construct in the words of the respondent or a concise summary was used from the interview transcript. Additionally, different coloured cards were used for the different organisations. This was followed by researchers A and B examining in detail the interview transcripts and interview grids. Following this, both researchers independently grouped common constructs into categories. All 272 constructs were categorised. Researcher A grouped the 272 construct cards into 46 categories. Researcher B grouped the 272 construct cards into 43 categories.
2. *Reliability table*: the next step involved producing a reliability table showing the independently coded categories to emerge represented across two axis in an excel sheet. The cells of this 46 x 43 table were annotated with the code identifying the company, interview number and construct number. Those areas of the reliability table that clearly showed agreement were shaded. A further step was taken to reorganise the rows and columns to group cells were agreement existed into a diagonal (Jankowicz, 2004). The remaining constructs that sat above or below the diagonal indicated differences in opinion between researcher A and B.
3. *Initial inter-coder reliability check*: The initial coding process showed an inter-coder reliability of 48% for all the constructs. According to Miles and Huberman [25], this figure is representative for this stage of coding and demonstrates the need to clarify the definitions of the categories.
4. *Enhanced category definitions*: the next stage involved the lengthy process of the two authors discussing the constructs that sat outside the diagonal of the reliability table. These discrepancies highlighted by the reliability table were thoroughly discussed and debated vigorously, with clear definitions agreed upon [25] as to what the category included. In order to ensure content validity, researchers A and B constantly referred to the interview transcripts in informing agreement over category definitions.
5. *Re-coding the constructs:* In line with Jankowicz [21], researchers A and B repeated the process of coding the 272 constructs into one of the enhanced categories. This process was conducted independently and without discussion or debate. The outcome of the re-coding resulted in a second reliability table [21, 25].

5 Findings

The analysis process described above led to the coding of 29 enhanced categories shown Fig 2 representing the value dimensions identified by customers in relation to their consumption of maintenance services. In the figure the categories have been

organized across three distinct process phases and arranged into three columns. The columns contain the categories that are most relevant for end-users and decision-makers, with the middle column highlighting those categories that are considered important by both end-user and decision-makers.

It is clearly evident that the use value of the service offering is evaluated differently by the two user groups. This finding highlights the importance of targeting maintenance services appropriately to different user groups in a customer organization. In particular, the model demonstrates that end-user needs are orientated around day-to-day matters, issues that will support them in the running of the production line. Whilst, decision-maker needs are geared around financial drivers, such as cost-savings, pricing of equipment and managing risk. Moreover, the model describes three distinct process phases that customer organization goes through over time. Hence, the value is attributed differently over time as needs and priorities change. Phase 1 and 2 of the model respectively represents the initial phase of conducting outsourcing in customer company and the phase that the relationship is getting steadier. Phase 3 of the model further elaborates on this to show that the value dimensions do not change in terms of needs, but the desired improvements are different between two groups: end-users a greater degree of maintenance service in managing equipment, whilst decision-makers seek further cost savings and seek innovation from the supplier organisations as the relationship matures.

Moreover, maintenance outsourcing companies should consider the somewhat contradictory fact that it is easier to show the benefits of outsourced maintenance activities at the beginning of contracts. At this “honey moon stage” it is easier to demonstrate the benefits of maintenance outsourcing with decreasing failure rates than it is when the production line is running smoothly in more mature phases [9].

Of particular interest is the paradox that exists in terms of customers outsourcing their maintenance to benefit from greater technical expertise, but over time the loss of control over knowledge internally is an important category to emerge. Consequently there is a delicate situation in which, on the one hand, the supplier needs to provide technical expertise but over time also allay fears resulting from further loss of knowledge for the customer needs managing. Important categories, such as the need for communication and understanding the customer business figure prominently in the values which customers attribute to service offerings. These use value dimensions have important implications for the design of service offerings from the supplier perspective that need to account for the customer needs. In this respect, there is a challenge for suppliers of servitized offerings to manage complex scenarios where customers sense the loss of knowledge from outsourcing in-house maintenance to lead them becoming too dependent on the supplier organisation.

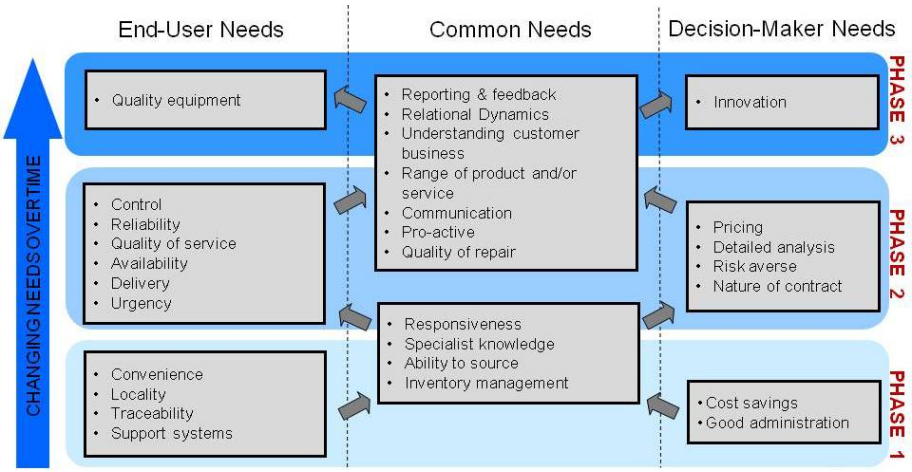

Fig.2. a model of end-user and decision-maker needs

6 Discussion

This research has described the value dimensions customers use to evaluate outsourced maintenance services. Moreover, it has highlighted how end-users and decision-makers assess value differently. Important implications are drawn from this study for suppliers to consider how customers assess servitized offerings. Importantly, value-centric approach that incorporates the value-creating capacity of maintenance services needs to account for the longer-term relational issues. As discussed earlier, satisfying customers by showing cost savings in early stages of maintenance contracts is likely to prove easy. However, as the relationship progresses across the next two phases, the supplier is likely to find considerable challenges in delivering continuous cost savings as the use value metrics used by customers evolve overtime. We concur with the findings of Stremersch et al [8], in that, end-users will influence the decision-making process but that it is the decision-making unit which in actual fact is responsible for outsourcing contracts.

The needs of end-users and decision-makers are clearly shown to change over time. Such a perspective needs to be accounted for, in order to understand that use value categories are not static dimensions. Hence, it is fair to conclude that no such thing as a steady state exists, rather that customer organisations are found to be in a constant state of flux as advocated by Chia and Tsoukas [26].

Our research has also confirmed that people in different organizational levels, are active participants in decision making process and a well-informed decision making requires a better understanding of the different maintenance stakeholders' evaluation criteria and the extent to which they have influence on decision making process.

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