African Journal of Business Management

Full Length Research Paper

Assessing the after-sales performance of an IT product-service company

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A product-service system (PSS) can be perceived as an extension of the functionality of a physical good to which specialised services are added. IT (Information Technology) companies have operated with a PSS model in a business-to-business (B2B) context and are referred to as IT PSSs in this paper. In addition to software and hardware products, IT PSSs provide after-sales services to clients such as system operation, installation, maintenance, support, and customisation. The objective of this paper is to identify and assess the after-sales performance of an IT PSS. A medium-sized IT company located in an emerging economy facing global competition was studied. The Analytic Hierarchy Method (AHP) was used to assess the relative importance of after-sales dimensions. The company develops and sells IT management software. Some services are associated with the software offerings: system maintenance, management of the client company's IT management software, and customisations. The after-sales performance was 54.5%. The dimensions 'Installation', 'Training' and 'Support for use' have the highest relative importance and highest gaps. These results suggest that initial improvement actions should focus on these dimensions. The proposed method of assessing after-sales performance may be adapted to other companies and applications.

Key words: After-sales, product-service system, IT companies.

INTRODUCTION

Dependence on software has made the software industry among the fastest-growing knowledge-intensive Industries. As evidence of this growth, the average IT market growth in EU countries between 2006 and 2008 is 2.9%, whereas the average software product's market growth over the same period is 6.5% (Aramand, 2008). According to the latest forecast by IT market analysis, worldwide IT spending is projected to total US$3.7 trillion in 2013, a 4.2% increase from 2012 spending of US$3.6 trillion (QFinance, 2013).

A primary focus on production may not be sufficient for

the IT industry to ensure competitive advantage in a scenario of global competition. Products with added services pose challenges to product design and begin to be considered as a package or provision of solutions (Gebauer, 2008; Yang et al., 2009). Service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product (Kotler, 1997). The intangible aspects of services are added to the tangible aspects of products, creating a favourable environment for long-term

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relationships between partners (Yanamandram and White, 2006). A system of organisation performance evaluation in a collaborative environment should be considered and outlined (Saiz et al., 2010).

Several companies have considered after-sales services to be a business option after observing a decrease in sales for their primary products. As a term, "after-sales services" has been used the most to describe services that are provided to the customer after the products have been delivered (Vitasek, 2005).Product support services are increasingly becoming an area for competitive advantage (Kotler, 1997). Services that are added to products can generate revenues that are three to four times greater than product-generated revenues (Bunschuh and Dezvane (2003), which helps to ensure product functionality and the maintenance of market leadership (Gebauer, 2008). Companies can compete for innovation based on after-sales services, which represent a significant source of revenue and profit (Gebauer and Fleisch, 2007; Gaiardelli et al., 2007).After-sales services affect the perceived value by the customer and thus, the quality of the relationship between buyers and sellers. The importance of quality of after-sales services for customer satisfaction could be crucial; furthermore, customer satisfaction was measurable (Fazlzadeh et al., 2011). In many cases, IT companies have added services to their offerings and take risks in and full responsibility for operating system within clients' business, which may result not only in additional revenue but also in added value (Gebauer, 2008). Profitability and sustainability of IT companies in long run cannot be ensured without focusing on human resources management, a critical point to deal with challenges in IT sector (Yadav, 2013).

Despite the alleged strategic importance of specialised services for technology-based products, few studies on strategy and after-sales services exist (Oliva and Kallenberg, 2003; Saccani et al., 2007). The literature lacks more information on how to devise a strategy that can face the challenges of such an activity. As a result, the strategic role of after-sales operations can and must be reassessed (Saccani et al., 2007), exploring items like electronic after-sales for technology-based products (Khaksar et al., 2011). Likewise, the literature fails to explore issues related to software post-implementation, especially for software whose life cycle is considered to be long, such as management or ERP software (Gwillim et al., 2005).

Complementing the above scenario, terms such as the product-service system (PSS) have recently been found in the literature. The concept of the PSS is centred on the concept of 'selling performance' instead of selling 'products or goods' (Spring and Araújo, 2009; Lin et al., 2010). PSS design plays a crucial role, as services should be designed for the entire activity chain, including policies are related to human resource management,

whereas physical and/or technological products must be designed to meet the performance expected by consumers (Armand, 2008). The complexity of PSS implementation arises because several possibilities must be considered when solutions are provided; moreover, services have a significant amount of intangibility. PSS changes the way in which products are consumed: an increase occurs in the use of leasing, pay per use or pay per result obtained. Switching from the traditional approach of selling goods and/or services to selling PSS can result in increased overhead for producers and increased variable costs for consumers (Spring and Araújo, 2009).

Despite the relevance of PSS, studies on the issue are still incipient, and no organised material has been found that describes a framework for the important after-sales dimensions of a PSS (Kimita et al., 2009). In addition, there is little research focusing on long-term performance following the implementation of the software in management systems (Häkkinen and Hilmola, 2008). This paper focuses on research opportunities considering that many IT companies have operatedusing a PSS model in a B2B (business-to-business) environment. These companies are referred to in this paper as IT PSSs.

This study took place in Brazil. According to Gartner Research, "Brazil's economic footprint, combined with the largest domestic IT consumption in Latin America, as well as international recognition as one of the most promising and rapidly emerging economies, makes it a natural destination to evaluate for IT services" (SourcingLine, 2013). The software industry in most countries, including Brazil, is composed of an industrial scheme that is made up mainly of small and medium software enterprises—SMEs (Pino et al., 2008). These companies have faced competition from large multinational companies. Global companies, which are driven by global crises such as the 2008 financial crisis, have identified small- and medium-sized enterprises (SMEs) in emerging countries as a potential market; until recently, these SMEs were serviced primarily by local companies (Prikladnicki and Audy, 2010). To reduce the cultural and legal barriers and make use of a local service base that is already installed, alliances between regional and global companies have been made (Miyazaki et al., 2012).

The following research questions were addressed in this study: (i) what are the after-sales dimensions present in an IT PSS, and (ii) how are the performances of the after-sales dimensions? The objective of this paper is to identify and assess the after-sales performance of an IT PSS. The research method used was a case study. It took place in a southern Brazilian company that develops management software as a PSS and has observed increased global competition since 2008. In this study, after-sales performance refers to the degree of application of after-sales dimensions. The constructs representing after-sales services in an IT PSS were denomi-

nated dimensions.

Background

Product-Service System (PSS)

A PSS can be observed as a 'social construction' that is based on drivers such as objectives, expected results and criteria for solving problems which may involve several actors in long-term partnerships. A PSS results from a value co-production process that involves such partnersas providers, dealers, and customers. The effectiveness of a PSS is based on shared views and on the analysis of prospective scenarios (Morelli, 2003).

The product-service system (PSS) started by providing industrial services in a B2B context; it was based on a series of activities connected to customer value. Maintenance, repair, operation services and production services are the main services provided by a supplier of industrial services (Datta and Roy, 2011). A transition from industrial services to product-service is needed when firms transit from providing a service supporting the customer´s product to a service supporting customer actions (Manzini and Vezzoli, 2003).

Scholars such as Tukker (2006), Azarenko et al. (2009) and Yang et al. (2009) have outlined three types of PSS:

Product-oriented service: producers sell a physical product and offer services that are required during the product use phase (e.g., maintenance contract), or producers offer advice concerning ideal purchase or use strategy (e.g., providing organisational training for product use);
Use-oriented service: a service provider retains product ownership and a used fee is regularly paid;
Result-oriented service: a portion of activities are outsourced to another company or results that were previously agreed upon by the provider and client are provided (e.g., offering a thermally pleasant environment instead of selling an air conditioner).

The advantages to PSS suppliers include the following: enlargement and diversification of the service, maintenance of a pre-set market share, facilitation of the interaction between the product and the service, and ease in maintaining a pre-set level of product quality (Mont, 2002). The advantages to buyers include the following: more options in the vendor market, maintenance and repair services associated with the purchase of the product, the prospect of different regimes of product use, and customised offers with greater value added (Mont, 2002).

Despite the advantages listed above, the following disadvantages to both buyers and suppliers have been noted: a lack of regulation (including labour law aspects), a lack of market acceptance as a result of not fully understanding the advantages of additional services that are added to the solutions package, a lack of strategic planning, the customer's fear of changes, and a lack of technically and organisationally skilled staff to operate in a PSS environment (Kuo et al., 2009).

This study was performed in a use-oriented context.

After-sales service in B2B relationships

After-sales operations that are coupled with technology-based products have fostered long-term relationships between producers and clients. Traditional after-sales service usually includes the training, maintenance, product use, design and management of upgrades (Mathieu, 2001). From the supplier's point of view, after-sales services and technology-based product links can be justified by the following conditions: revenue increases during the life cycle; diversity of clients using products and services; and differentiation from low-cost competitors (Oliva and Kallenberg, 2003).

After-sales service may even transit into a particular business, as observed with IT companies that design and install hardware and software. The software improvement process has not been sufficiently explored (Galinac, 2009). This process results from the definition of which improvements must be made and is followed by improvement, validation and integration with the new version.The definition of what must be improved may stem from the relationship with clients and from clients' input on product performance. For management software, such as ERP (Enterprise Resource Planning), after-sales dimensions may relate to software maintenance, user support and customisations that were not defined prior to implementation (Poon and Yu, 2010).

After-sales service in IT PSS

Developing a software system entails the development of new software products and services (Aramand, 2008), which can be considered a PSS (Tukker, 2006). In the design and development of software systems, technology does not necessarily play a central role. The technology and development languages of most software application frameworks are widely available to development companies (Aramand, 2008). Providing solutions, including services (and after-sales) could be a means of offering value to customers in such a scenario (Azarenko et al., 2009). However, for some companies, the transition to a PSS operation does not occur in a deliberate way (Tukker, 2006), with only after-sales services being included. It may be difficult to identify the most important elements that aggregate value.

Besides these, small and medium-sized companies (SME) in IT industry have been facing globalized competition (Ruokonen and Saarenketo, 2009). According to these authors, companies in IT industry do not necessarily need heavy investments in plant, equipment or other physical resources in order to produce a large number of products. Therefore, these companies should build competitive advantage on intangible know-how instead of tangible resources. On the other hand, SMEs have little formal structures and restricted scope in their activities because of their limited resources (O'Dwyer et al., 2009). These aspects could influence the after-sales operations in SMEs from IT industry.

This research has been focused on to identify the most elements of after-sales that aggregate value, considering the characteristics of IT PSS and to assess the performance of these elements. The expected contribution is to support the studied company making decisions considering the presence of global competitor and limited resources.

RESEARCH DESIGN

The objective of this paper is to identify and assess the after-sales performance of an IT PSS. This study is intended to contribute with a case study in which a situation was heuristically constructed to test an idea. This case study is a pilot case. Along with other cases that have increased scope and depth, this case study can contribute to a prospective grounded theory and ultimately produce a general analytical model of after-sales dimensions for IT PSSs (Eisenhardt, 1989).

The company studied develops and sells IT management software. The company also offers several types of services: system maintenance, management of client companies' IT systems, and customisations according to clients' demands. The company operates in an emerging market and interacts with large and medium-sized companies. Any company with an IT structure that is in need of management is considered a potential client.

The company operates in the IT market by means of its sales channels, or dealers, whose primary job is to expand the business. Dealers are also expected to prospect clients, close sales, install products and provide clients with initial after-sales assistance. Dealers work on commission, which varies according to the services offered to clients, which range from simply prospecting clients to providing clients with user support for initial product or service use. When involving dealers, the sales model allows a greater number of clients to be reached because dealers can usually access clients directly due to the wider range of products and services that they can offer. The company competes with significant foreign players, such as IBM, Microsoft, and Symantec, among others. Competition with such companies has increased in intensity following the 2008 financial crisis.

To identify and assess after-sales performance, the relative importance of each after-sales dimension was first defined using Analytic Hierarchy Process (AHP). AHP works by establishing preferences. AHP is the least difficult approach for measuring the performance of multicriteria systems and the most trustworthy evaluation scheme (Rangone, 1996). Munier (2011) summarises the stages of AHP. In its first stage, the process computes the criteria weight. The process begins with paired comparisons of criteria and the construction of a square matrix from which the

eigenvector is calculated, which is then utilised as a weight vector for criteria. During the second stage, alternatives are compared with each other in terms of a specific criterion. This procedure is repeated while considering all criteria and the weighted summation of these values indicates the dominant alternatives and thus the ranking. Although the components of the eigenvector set the priority levels for each element, the largest eigenvalue (λ_{max}) is used to measure the consistency of the judgment CR (consistency ratio). The consistency ratio is verified to be CR<0.10 (Saaty, 2005). Details of preference options based on paired comparison can be found in Saaty (2005). Munier (2011) presents some examples of the application of AHP.

The working method for this research followed the steps presented below. In some steps the focus group was responsible for the task. The focus group members were three researchers with executive experience in after-sales services, and three managers. The managers are in charge of development, sales and services of the studied company.

Step 1 - Identification of the after-sales dimensions: A tree-like structure (Forman and Selly, 2001) of the after-sales and its dimensions was proposed by the focus group. Such a structure organised the relevant strategic topics, which may be found in the after-sales operations of a company that offers IT management solutions as part of a PSS. Each after-sales dimension was unfolded into assessment items capable of describing the meaning of each dimension.

Step 2 - Evaluation of the relative importance of each after-sales dimension: The evaluation was conducted by the focus group with AHP. The final result is the relative importance (expressed as a percentage) of each dimension. The CR was calculated.

Step 3 - Assessment of the performance of after-sales: A questionnaire with categorical answers was created by the researchers considering the assessment items associated with the after-sales dimensions. The objective is to assess the level of application of each assessment item. The following scale was considered: 1 – excellent fulfilment; 0.75 – very good fulfilment; 0.50 – good fulfilment; 0.25 – poor fulfilment; and 0 – lack of fulfilment. The validation of the contents was performed by the focus group as described in Malhotra (2006). The questionnaires were answered by 10 employees: 6 managers among the dealers, and 4 employees who work in after-sales activities (development manager, coordinator of technical supervisors, sales manager and education and training coordinator). These respondents represent approximately 90% of the workforce of the company that is directly involved in after-sales activities. The performance of each dimension is obtained by determining the values attributed to each question related to the evaluated dimension and converting them to a percentage. Then, the average degree of each dimension is converted to a value in percentage points (pp); for example, if we say that a dimension has an importance of 20%, and its degree of application is 50%, then the degree of application is 10 pp.

Step 4 - Understanding more deeply the performance of the after-sales: Using a set of open questions, respondents provide their perceptions about the after-sales dimensions. The researchers interviewed each respondent.

Step 5 - Analyse the performance of each dimension and identify the gaps considering their importance: Discuss, by the focus group, the gaps between the importance and the performance and propose improvements.

The focus group participants considered the company to operate with a use-oriented PSS. The company retains product ownership and is supposed to define the terms of product use; i.e., it is responsible for providing product maintenance, installation and improvement as well as client support, if required, while the client uses the product. Clients periodically pay a fee for product used.
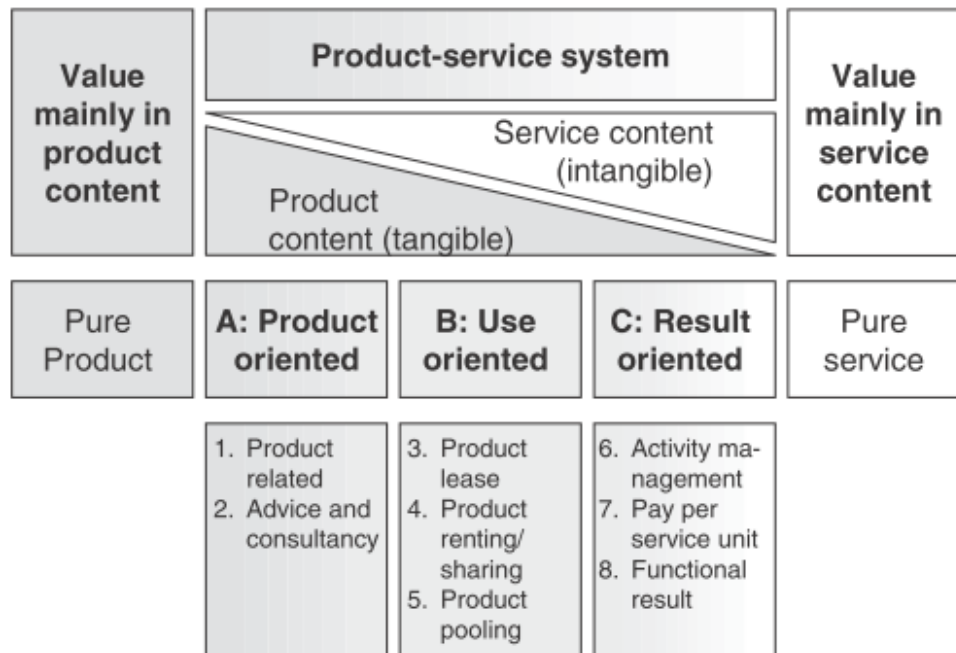
Value mainly in product content	Product-service system			Value mainly in service content
	Product content (tangible) / Service content (intangible)			
Pure Product	**A: Product oriented**	**B: Use oriented**	**C: Result oriented**	Pure service
	1. Product related 2. Advice and consultancy	3. Product lease 4. Product renting/ sharing 5. Product pooling	6. Activity management 7. Pay per service unit 8. Functional result	

Figure 1. Categories of PSS. Source: Tukker(2006).

RESULTS

First, the focus group participants defined after-sales dimensions. Six after-sales dimensions were considered; each after-sales dimension was unfolded into assessment items (Figure 1), resulting in a total of 22 assessment items.

After-sale dimension 'Installation' refers to the identification of the clients' IT system requirements; definition of the required methods and schedule to install IT management software (denominated pre-installation); software installation, adherence to deadlines and schedules previously agreed upon with the client. The four assessment items for this dimension were: (1) define requirements, methods and schedule for installation (pre-installation); (2) perform installation in compliance with pre-installation; (3) meet deadlines and schedules; and (4) perform installation that will not require later fixes.

After-sales dimension 'Training' is related to training capability to meet technical targets; use of adequately configured hardware, software and access during training sessions; ability of the instructors to pass the technical knowledge outlined in the course syllabus, communicate efficiently and establish rapport. The assessment items were: (1) capability of training to meet previously set technical targets; (2) provide/make available adequately configured equipment (hardware), software and access during training sessions; and (3) instructors' capability to pass on the technical knowledge outlined in the course syllabus, communicate efficiently, and establish rapport.

After-sales dimension 'Customisation' considers clients' needs and demands arising after product sale; capability to propose suitable alternatives to clients; implement customisations within the set deadlines and do so effectively to meet clients´ needs and demands. The assessment items were: (1) identify clients' needs and demands with regard to product customisation; (2) propose adequate alternatives to clients and companies (in terms of technological effort, deadline and cost); (3) implement customisations to fulfil clients' needs and demands; (4) implement customisations and/or provide clients with subsequent training; and (5) meet deadlines set for customisation.

After-sales dimension 'Support for use' considers the fulfilment of clients´ demands regarding product use with concomitant adherence to previously set deadlines. The assessment items were: (1) fulfil clients' demands with regard to product used; and (2) meet deadlines set with clients.

After-sales dimension 'Consultancy' encompasses the implementation of the clients´ IT management activities and the fulfilment of clients´ demands for technical support for product used. The assessment items were: (1) implement clients' IT management activities; and (2) fulfil clients' demands for use support.

After-sales dimension 'Troubleshooting/product upgrade' considers the capability to understand clients´ problems and resolve such problems within the agreed-upon deadline. It includes the consolidation of the improvements identified during problem resolution in the
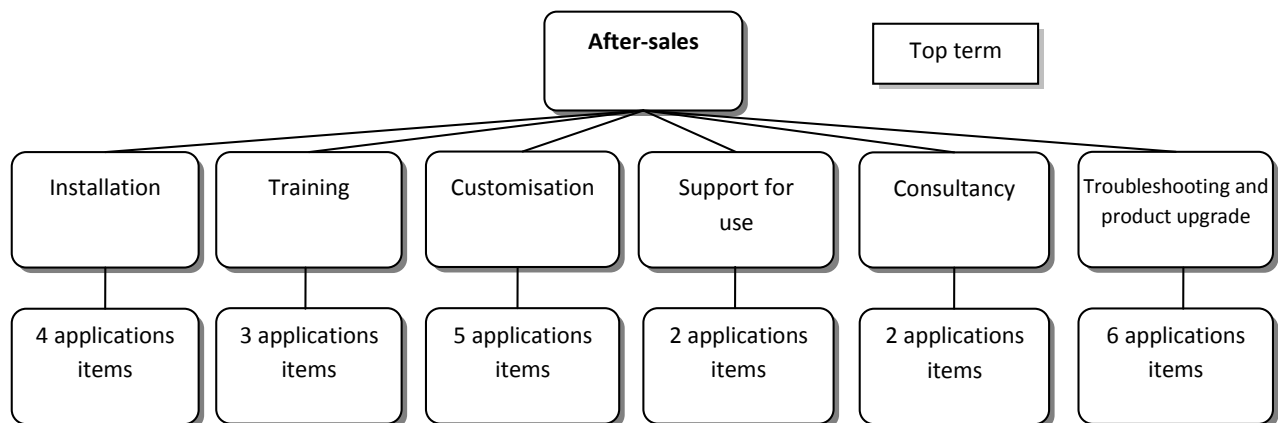
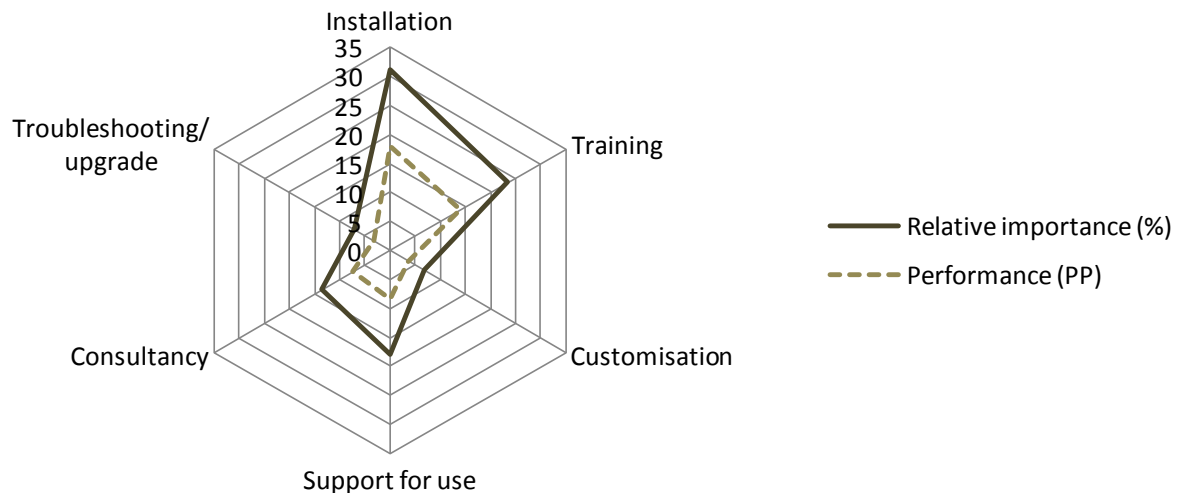**Figure 2.** After-sales dimensions.

Figure 3. Relative importance x performance for each dimension

product version upgrade, which follows a launch schedule and delivery to clients. The assessment items were: (1) understand clients' problems; (2) solve clients' problems; (3) delivery solutions within the set deadline; (4) consolidate improvements that result from 'product troubleshooting' activities; (5) inform clients of upgrades; and (6) meet deadlines and make upgrades available.

The relative importance of each after-sales dimension was assessed, by the focus group, using AHP (Figure 2). Table 1 shows the matrix of preferences. Table 2 indicates the relative importance of the dimensions. The CR was 0.70; this value is considered acceptable, according to Saaty (2005).

The performance of after-sales dimensions was calculated based on the answers to the questionnaire. The values in percentage (%) and in percentage points

(pp) and the gaps between the relative importance and performance were calculated.

The company fulfils the dimensions defined for after-sales activities with 54.5%. The results show that there is no particular dimension with very high performance (Figure 3). The dimensions 'Installation', 'Training' and 'Support for use' have the highest relative importance and highest gaps. These results suggest that initial improvement actions should focus on these dimensions. The analysis of the level of application of the assessment items through the study of the average scores has revealed that the items with the worst levels of application are as follows: (i) Capability to inform clients of upgrades; (ii) Capability to perform installation that will not require later fixes; (iii) Capability to meet deadlines set with clients for support activities for product use; (iv) Capability to

Table 1. Matrix of preferences

After-sales dimensions	Installation	Training	Customisation	Support for use	Consultancy	Troubleshooting/ upgrade
Installation	1	2	3	3	2	3
Training		1	2	2	3	3
Customisation			1	1/5	1/3	1
Support for use				1	2	2
Consultancy					1	3
Troubleshooting/upgrade						1

Table 2. Relative importance and performance of after-sales dimensions.

Dimension	Relative importance (%)	Performance (%)	Performance (pp)	GAP (pp)
Installation	31.2	58.1	18.1	13.1
Training	23.4	59.2	13.9	9.5
Customisation	6.8	54.2	3.7	3.1
Support for use	17.9	46.2	8.3	9.7
Consultancy	13.6	53.7	7.3	6.3
Troubleshooting/Upgrade	7.1	46.1	3.3	3.8
TOTAL	**100.0**	**54.5**	**54.5**	**45.5**

meet deadlines set for customisation; (v) Capability to deliver solutions within the set deadline; (vi) Capability to meet schedules and make upgrades available; and (vii) Capability to meet deadlines and comply with schedules for installation. The last five items described refer to meeting deadlines, which are considered critical in all of the dimensions.

On average, the highest scores were observed for the following assessment items: (i) Capability to define requirements, methods and schedule for installation (pre-installation); (ii) Capability to perform installation in compliance with pre-installation; (iii) Capability to provide/ make available adequately configured equipment (hardware), software and access during training sessions; (iv) Capability to identify clients' needs and demands with regard to product customisation; (v) Instructors' capability to pass on the technical knowledge outlined in the course syllabus, communicate efficiently, and establish rapport; and (vi) Capability of implemented customisations to

meet clients' needs and demands. The assessment items with the best levels of application were observed for the dimensions 'Installation', 'Training' and 'Customisation'. There are no assessment items with outstanding levels of application for the dimensions 'Support for use', 'Consultancy' and 'Troubleshooting and product upgrade'.

One of the respondents emphasised the company's lack of systematic processes, which hinders interaction between sectors and the achievement of quality standards for the services provided; this respondent also highlighted other difficulties, such as resistance to change and a lack of monitoring and verification of compliance with the company's existing rules. This respondent suggests that the alignment of processes, staff commitment and serious adherence to procedures should help to enhance the capabilities of after-sales operations and customers' satisfaction. Another respondent considered the lack of communication between the company and clients to be a critical issue. Another suggestion was that

dealers and/or clients be informed (by e-mail) more often when hot fixes and new versions are available on the company's website. Another respondent reported problems with customisation delivery deadlines, which are not usually met. One of the respondents emphasised the fact that support activities can meet demands when the problem is simple; however, in complex situations, difficulty is experienced in reporting the problem directly to the person in charge of communicating with the client (dealer). This difficulty can cause noise in communication and interfere with client relationships. However, this respondent believes that 'Training' is satisfied as a dimension.

DISCUSSION

A method was proposed for identifying and assessing the performance of after-sales dimensions in an IT PSS. This method considers that company resources are limited and that it could be interesting to identify the performance of each after-sales dimension to prioritise improvement actions.

In general, all dimensions show similar performance, but within each dimension, the assessment items have heterogeneous levels of application. The assessment items related to meeting deadlines are noteworthy because most of them exhibit some of the worst performance. By analysing the respondents' comments, it is possible to note that a lack of systematic processes and adherence to the company´s rules could compromise deadlines and, consequently, customer satisfaction. The transition to a PSS in this company occurs without a redesign of the process, including after-sales. Yoon et al. (2012) note this aspect, reinforcing the importance between providing services with agreement points between consumers´ needs and service providers´ interests. As a suggestion for improving performance related to deadlines, the company should establish and control indicators to measure this performance, as presented by Schweitzer and Aurich (2010).

The assessment items with the best levels of application are usually related to the company's technical capability and training. According to some managers, employees have adequate technical knowledge and are able to transmit technical knowledge. Therefore, for software development activities, some consider it difficult to follow procedures or be controlled by the results of some indicators. The company understands that it is necessary to produce higher staff commitment to improve global performance in after-sales and customer satisfaction and retain the market, which now contains new global players. In this case, according to managers, the company strategy should be better deployed and communicated to the staff. This situation is in line with García-Pérez-de-Lema et al. (2012) considering the

success of an SME has a strong relation with its human resource (HR). Software development entails developing a software product and a software service concomitantly (Aramand, 2008). According to the author, the life cycle of the software system (product and service) should be considered. Doing so will demand new approaches and learning, as observed in this study.

Conclusion

The objective of this study was to identify and assess the after-sales dimensions found in an IT PSS. A set of after-sales dimensions in a PSS was proposed. An AHP was used to identify the importance of each dimension. Their respective performance was measured based on managers and dealers' perceptions.

The company's point of view was represented by the managers; the focus group considered the dealers to partially represent the clients' view. To minimise this limitation in the future, clients could answer the questionnaire and discuss opportunities for after-sales improvement.

The focus group and respondents considered the weighting system (AHP) adopted in the method to be easy to understand and to apply. All of the respondents and managers considered the results to be coherent with their feelings about after-sales performance. Factor analysis could be used, in the future research, to find out the variables which are related with customer satisfaction. Using the proposed method, the assessment of after-sales performance could be reapplied at regular intervals to assess the evolution of the results. In the same manner, the method could be applied to other after-sales processes. The use of AHP allowed ranking the dimensions according to their importance (Rangone, 1996; Munier, 2011 and Saaty, 2005). As AHP is based on judgment, the rank and magnitude of the dimension appears to be more relevant than the percentage of relative importance per se.

The identification of the overall performance of after-sales operations in the case study company has revealed to managers some relevant gaps, which can be prioritised as follows: (i) meeting deadlines – in this case, verify with clients the deadline that isnecessary and analyse the resource allocation process to ensure that deadlines are met; (ii) improve the system of communication with clients and dealers; and (iii) establish formal procedures and ensure that they are followed.

This study proposed a method for assessing the importance and performance of after-sales operations in anIT PSS. It should be noted that the proposed method can be adapted to other PSS categories. The method also enables organisations to understand strategic priorities regarding after-sales operations and reallocate resources to dimensions presenting wider gaps. This study indicates the necessity of rethinking the after-sales

process of the company; currently, the focus on service is less important than the focus on the technological aspects of software development.

ACKNOWLEDGEMENTS

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