



Aligning strategic profiles with operational metrics in after-sales service

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Abstract

Purpose – The purpose of the paper is to overcome the limitations of the current models available in the literature in terms of relation and consistency between business strategy, service chain configuration and performance measurement systems, and on the alignment between strategic, tactical and operational levels of after-sales decision-making processes.

Design/methodology/approach – The paper draws on a literature review of after-sales performance measurement systems and provides a first validation of the proposed integrated model through industrial case studies related to the provision of durable consumer goods in a business to consumer scenario.

Findings – The paper aims to contribute to a better understanding of the factors which influence the performance of after-sales, in order to allow enterprises to consistently design their corporate after-sales service strategic performances with those required at operational levels within a service chain.

Research limitations/implications – Further development must be carried out in order to: enlarge the sample of companies and cases where the model can be applied, with a specific extension on a business-to-business industry; extend the model to the whole supply and service chain; enrich the framework in order to consider other aspects, as empathy; and develop a full integration with the SCOR model, including the definition of best practices.

Originality/value – The integration of the strategic and operational views subsumed by the framework would allow enterprises in relating more consistently their corporate After-sales strategic and operational performance within a service chain and to assess the cause and effect relationship between operational drivers and financial and competitive results.

Keywords After sales service, Performance measures, Business performance, Service calls

Paper type Research paper

1. Introduction

The actors of the supply chain, from manufacturers down to wholesalers and retailers, cannot consider their business role ending up with the transactional undertaking of product sale. They must indeed strive their efforts in ensuring a long-lasting and stable relationship with the final customer through the overall product life-cycle by providing a customised and value-added portfolio of connected services.

In the western mature economies, the evolution of cultural and sociological models, along with the continuous breakthrough of the technological edges, are driving consumers to put more emphasis on the functional properties of a product which can fulfil their sophisticated, tailored and changeable needs, than on the joy of purchasing and owning a physical product.

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From the offer standpoint, the widespread proposals of goods embedding the same aesthetics, functionalities and technologies, force industrial companies to shift their traditional product-centric business perspective to a more profitable and sustainable customer-oriented strategy. This strategy is mainly pursued by endowing a product with tangible and intangible elements of differentiation, which make it perceived as unique, not easily replaceable and qualified for setting premium prices. Transitioning from a product manufacturer into a service provider constitutes a major managerial challenge. Services require organisational principles, structures and processes new to the product manufacturer, which encompass the whole product life-cycle, from its conceptual phase to its latest dismissal point (Oliva and Kallenberg, 2003). The increasing importance of intangible factors is changing the concept of the product which, traditionally seen as a tangible entity, tends at de-materializing and becoming a component of a more complex platform (Rispoli and Tamma, 1992, Thoben *et al.*, 2001). Studies on design for serviceability (Teresko, 1994), for supportability (Goffin and New, 2001), for maintainability (Ivory *et al.*, 2003), and for life-cycle (Kuo *et al.*, 2001) are all evidences of the need to establish a thorough relationship between customer support requirements and new product development.

In this context, after sales service, traditionally confined temporally as taking up those activities occurring after the purchase of the product and devoted to supporting the customer in the usage and disposal of the goods (Patelli *et al.*, 2004a), has been acquiring a strategic role within company's business as a first source of differentiation and profit generation. Its activities are becoming pervasive through all the main processes involved in the design and management of the product lifecycle. Profit margins generated by After Sales Service are often higher than those ones obtained with the product sales. It may generate at least three times the turnover of the original purchase during a given product lifecycle (Alexander *et al.*, 2002; Wise and Baumgartner, 1999).

Its impact is not only restricted to the company's economics. It is also a powerful marketing force for establishing a durable customer loyalty and promoting the company's brand. Gallagher *et al.* (2005) state that after sales service represents "one of the few constant connections that customers have with a brand", while Lewis *et al.* (2004) point out how it is affected by and affects the brand image of a firm.

Moreover, field data gathered from Technical Assistance Centres (TACs) represent a topical input for an effective undertaking of new product and service development (Armistead and Clark, 1991, Cohen and Whang, 1997; Thoben *et al.*, 2001), sales and promotion (Wise and Baumgartner, 1999; Gallagher *et al.*, 2005) as well as marketing and customer relationship management activities (Anderson and Kerr, 2001; Campbell, 2003). It is not possible to gain customer retention if a company does not lever on the competence, professional attitude and customer oriented culture of its front-end service technicians and field engineers.

As a result, the After Sales department is rapidly evolving into an independent business unit endowed with own profit and loss responsibilities and perceived as a main strategic driver for ensuring long-term revenues, customer satisfaction, customer retention, and a continuous improvement of the product and service quality, by performing an important supporting activity for other company's internal functions (design, quality, production, sales and marketing).

The importance of service, and in particular of the after sales one, requires a thorough monitoring and measuring of its activities along the service chain in order to ensure a proper balance between business and operational objectives and their assessment.

Performance measurement has become a popular topic for both industrialists and academics, reaching the stage of being identifiable as a specific subset in the operations management literature. However, despite this popularity, there is evidence that not all performance measurement initiatives are successful. Survey studies claim that 70 per cent of attempts to implement performance measurement systems fail (Neely *et al.*, 2003). In particular, in the industrial community no significant effort has been put on the definition of a structured after sales performance measurement system.

In this context, the paper aims at linking the main findings of two parallel research activities carried out in a two-year national research project, named "Advanced logistic and organisational models for the integrated management of the After Sales Service of durable goods" (ASAP), involving six Italian Universities, coming from different schools of management engineering and production economics.

In detail:

- (1) An integrated reference framework for after sales service performance measurement has been recently proposed by Gaiardelli *et al.* (2006); the framework integrates some relevant models in literature (Lynch and Cross, 1991; Kaplan and Norton, 1992; SCOR, 2005).
- (2) In Cavalieri *et al.* (2006), an enlargement of the Supply Chain Operations Reference model (SCOR, Supply Chain Council, 2006), termed as ASCOR model, has been proposed and tested on industrial case studies; the model aims at providing a comprehensive mapping of the after sales service chain operational processes and a systematic measure of their performance, by using the same performance attribute categories defined within the SCOR model.

Grounded on the integration of these two models and complementary perspectives, the objective of this paper is:

- to allow enterprises in relating more consistently their corporate after sales service strategic goals with those requested at more operational levels within the service chain;
- to identify the factors which impact on the relevance given by a company in managing and controlling a single after sales activity; and
- to assess the cause and effect relationship between operational drivers and financial and competitive results.

The paper is organized as follows: §2 provides a description of after sales service strategy and configuration, §3 is devoted to the presentation of the proposed model and §4 points out its application on three case studies whose discussion is finalized in §5; conclusions, managerial implications and further research developments are summed up in §6.

2. After sales service strategy and configuration

Several studies have investigated in the last years the increasing strategic importance of after sales service from a mere functional and supporting role to an important enabler of profitable service driven (Cohen and Whang, 1997) or customer loyalty driven strategies (Cooper, 1995; Ehinlanwo and Zairi, 1996; Seuring and Goldbach, 2002). Cavalieri *et al.* (2006) have identified four alternative after sales strategic profiles in companies operating in the business to consumer scenario (Table I):

- (1) *Product support.* This is the traditional role of After Sales Service seen as a “necessary evil” and a cost centre mainly deputed to manage warranty issues or early defiance of the product; typical strategy assumed for low cost items, as for small domestic appliances.
- (2) *Cash generator.* In this case After Sales Service represents a good source of revenues by selling spare parts and accessories (i.e. tangible items related to the product); companies belonging to this strategic approach try to regain the profitability lost in product sale during the after sales phase; typical behaviour for non commoditized products, as in the premium segments of the motorbike industry or in the consumer electronics.
- (3) *Business generator.* After sales proactively represents the business leverage for opening new market niches by developing and offering product-service bundles according to the specific customer profile and needs (with heavier influence of intangible items related to the product); this approach is mainly adopted in sectors where the high competitive pressure and market saturation strongly affect company’s profitability.
- (4) *Brand fostering.* On the management level quite similar to the previous profile, with a complex and highly service oriented component, though its main mission is not to act as a profit centre, but rather as an investment centre for excelling in product price, quality and functionality (i.e. the survival triplet coined by Cooper (1995)) and gaining customer retention and loyalty to the market product; typical long-term vision adopted by some Japanese car makers for gaining high market share.

While cash generator and business generator profiles are more related to a profitability-driven strategy, brand fostering is more suitable for a loyalty-driven approach. As it will be discussed in the next section, the implementation of these strategies requires the availability of a proper and consistent performance measurement system able to correlate coherently strategic profile adopted by a company with a set of performance measures.

3. Aligning after-sales strategic profiles with operational metrics

Literature related to performance measurement systems applied to service industry is wide and various. In general, a large amount of scientific contributions addresses the topic of performance measurement systems for service and manufacturing firms, analysing it at different levels from the strategic one to the definition of operational metrics. Notable examples of integrated frameworks are proposed and developed in the performance measurement literature (Keegan *et al.*, 1989; Fitzgerald *et al.*, 1991; Lynch and Cross, 1991; Kaplan and Norton, 1992, 1996; EFQM, 1998; Olve *et al.*, 1997). They

Table I.
Strategic profiles of
after-sales service

After-sales strategy	Business strategy	Relevance of after-sales	Economical responsibility	Product-service portfolio	Time horizon
Product support	Cost leader	Necessary evil	Cost centre	Relevance of tangible properties	Short-term
Cash generator	Cost leader Technological pioneer	Ancillary role Source of profitability	Profit centre	Relevance of tangible properties	Short-term
Business generator	Technological pioneer Differentiator	Generator of new business opportunities and profitability	Business unit	Relevance of intangible properties	Medium-term
Brand fostering	Best in all	Supporting company's image and customer loyalty	Cost/investment centre	Relevance of intangible properties	Long-term

aim at linking strategy formulation to strategy implementation, long-term goals and decisions to short-term objectives and actions as well as at defining a set of measures that reflect the organisations' objectives and assessing performance appropriately.

New dimensions of performance as stakeholders' satisfaction (Atkinson *et al.*, 1997; Wright and Keegan, 1997; Neely *et al.*, 2002), corporate social responsibility and sustainability (Epstein and Wisner, 2001; Figge *et al.*, 2002) and intangibles assets (Edvinsson and Malone, 1997; Sveiby, 1997; Stewart, 1999; Kaplan and Norton, 2004) are also analysed and considered in several scientific studies.

Although in several manufacturing sectors after sales is recognised as a key of competitive success, a few scientific works have been carried out on the development and adoption of specific performance measurement systems for after sales processes. In Gaiardelli *et al.* (2006), a classification of the major contributions on this topic is provided, along with the following research streams:

- product life-cycle (Shields and Young, 1991; Cooper, 1995; Cooper and Slagmulder, 1999, 2003);
- after sales strategy (Levitt, 1983; Armistead and Clark, 1991; Frambach *et al.* 1997; Lele, 1997);
- spare parts logistics (Papadopoulos, 1996; Hopp *et al.* 1999; Zhang *et al.*, 2001; Huiskonen, 2001; Kennedy *et al.*, 2002); and
- supply chain and process-oriented approach (Cohen and Lee, 1990; Supply Chain Council, 2006; Cavalieri *et al.*, 2006; Cooper and Slagmulder, 1999, 2003; Seuring, 2002a, b; Seuring and Goldbach, 2002; Patelli *et al.*, 2004b).

However, a common pitfall of these works is that they lack of a systematic approach linking corporate strategic objectives with after sales strategies and goals, and After Sales performance measures and indicators. A performance measurement system for the after sales service has to capture effectiveness and efficiency, short term and long term, tangibles and intangibles, operational and strategic decision making levels, thus adopting a multidimensional approach.

The same Gaiardelli *et al.* (2006) propose a reference framework for enabling a fully-comprehensive after sales performance measurement. The framework integrates some relevant models in literature (Lynch and Cross, 1991; Kaplan and Norton, 1992; Supply Chain Council, 2006) applying them to after sales activities (Figure 1). The framework is articulated into four levels:

- (1) At the strategic business area level, the overall after sales financial performance is considered; it is important to stress that the financial results are generated both by market results (market share, market penetration, etc.) that impact on revenue, and by the efficient consumption of resources (i.e. costs).
- (2) The second level of the framework is related to the process nature of after sales, composed by different activities, carried out various actors along the supply chain, which can be monitored in terms of customer satisfaction, flexibility and productivity, as suggested by Lynch and Cross (1991).
- (3) The activity level considers the performance of the after sales organisational unit in managing its specific processes; there is an explicit distinction between front-office processes, impacting directly on customer satisfaction, and back-office ones, which are more responsible for operations efficiency and

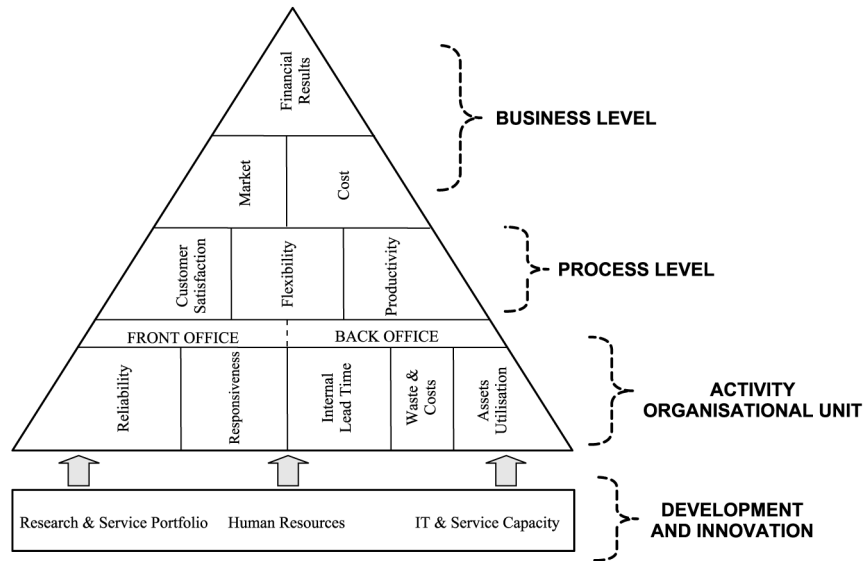


Figure 1.
Performance measurement
system for after sales
service

Source: Gaiardelli *et al.* (2007)

lead times; at this level five performance dimensions are considered: reliability, responsiveness, internal lead times (which are mainly measured by non economic indicators), waste, costs and assets utilisation (which are mostly evaluated through economic indicators).

- (4) The development and innovation dimension aims at capturing the drivers of stable and adequate future competitive and financial results, through:
- investments in new product and services, which assure the renewal of product and service portfolio according to customer needs and competitor actions;
 - investments in intangibles, such as human resources, which are particularly relevant in a service activity; and
 - investments in infrastructures (IT and service capacity), which allow a balanced growth of After Sales Service volumes and profit.

The performance dimensions subsumed at the activity level of the proposed framework are quite similar to the performance categories considered in the Supply Chain Operations Reference Model (SCOR), a framework developed by the Supply Chain Council (2006) which links business processes, metrics, best practices and technology features into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities.

To allow a perfect integration between the two models, a further extension of the SCOR model is required, since, in its current release, it purposely does not involve in its scope processes or activities related to demand generation, product development, research and development, and elements of After Sales customer support.

For this reason, Cavalieri *et al.* (2006) have developed the ASCOR Model in order to provide an exhaustive mapping of the after sales planning and execution processes and activities and proposal of a related set of metrics. The model is based on the same semantic structure of the SCOR formalism, since it is capable to integrate the different views related to processes, metrics, IT-enablers and managerial practices. In accordance with the SCOR model, three process categories have been identified and summarized in Table II. In each process category, both internal and external processes are identified:

- *internal processes*, which refer to back-office activities, involve only the company functions – examples of internal processes are marketing search, maintenance and warehousing; and
- *external processes*, which refer to front-office activities and involve the other actors of service chain (such as suppliers and customers) – customer care, marketing and pricing, network certification and service and order fulfilment are valid examples of external processes.

The further integration of the operating unit level of the proposed framework with the ASCOR Model (as shown in the Figure 2), could allow enterprises to align the adopted strategic profile with the procedures pursued by each organisational unit to manage and control every single after sales process, either external or internal and to identify a perfect consistency between their strategic performances and the operative indicators.

The suggested integration allows to monitor and evaluate the After Sales performance not only from a strategic and managerial point of view, which is of interest for top and middle management, but also with regard to efficiency and effectiveness of single activities at a tactical level, which are relevant to employees in charge.

4. Case studies

For ascertaining its validity and applicability in the industrial context, the proposed model has been applied on a sample of three companies operating in the automotive and motorbike sectors. In particular, in accordance with the aim of this article, purpose of this section is to show how a company can adopt a consistent design of its performance measurement system, in strict accordance with the business strategy it pursues.

Company 1

Company 1 is the Italian branch of one of the world's leading automakers, offering a full range of models from mini-vehicles to large trucks. It is organised in three business units directly depending on the CEO:

- (1) *Sales*, responsible for pricing, marketing, promotion and sales network management and control.
- (2) *Financing*, responsible for all activities concerning customer and network financing.
- (3) *After-sales*, responsible for the activities concerning spare parts management and distribution, assistance services, customer care, network support management and control.

Table II.
After-sales processes
identified in the ASCOR
model

Plan	Execution	Enable
P 5.1	Identification of service and spare parts demand	EPV 1
P 5.2	Assess resource availability	EPV 2
P 5.3	Balance between availability resource and client requirement	EPV 3
P 5.4	Establish and communicate service plans	EPV 4
		EPV 5
	PV 1	EPV 6
	PV 2	EPV 7
	PV 3	EPV 8
	PV 4	EPV 9
	PV 5	EPV 10
	PV 6	EPV 11
	PV 7	
	PV 8	
	PV 9	
	PV 10	
	PV 11	
	PV 12	
	PV 13	
	PV 14	

Objects and strategy definitions

Organizational structure management
Data management for quality and after-sales performance control

Logistics management

Support infrastructure management

Laws and rules management

Service definition and customer relationship

Service fulfillment management

Maintenance planning and warranty management

Procurement and demand management

Accounting management

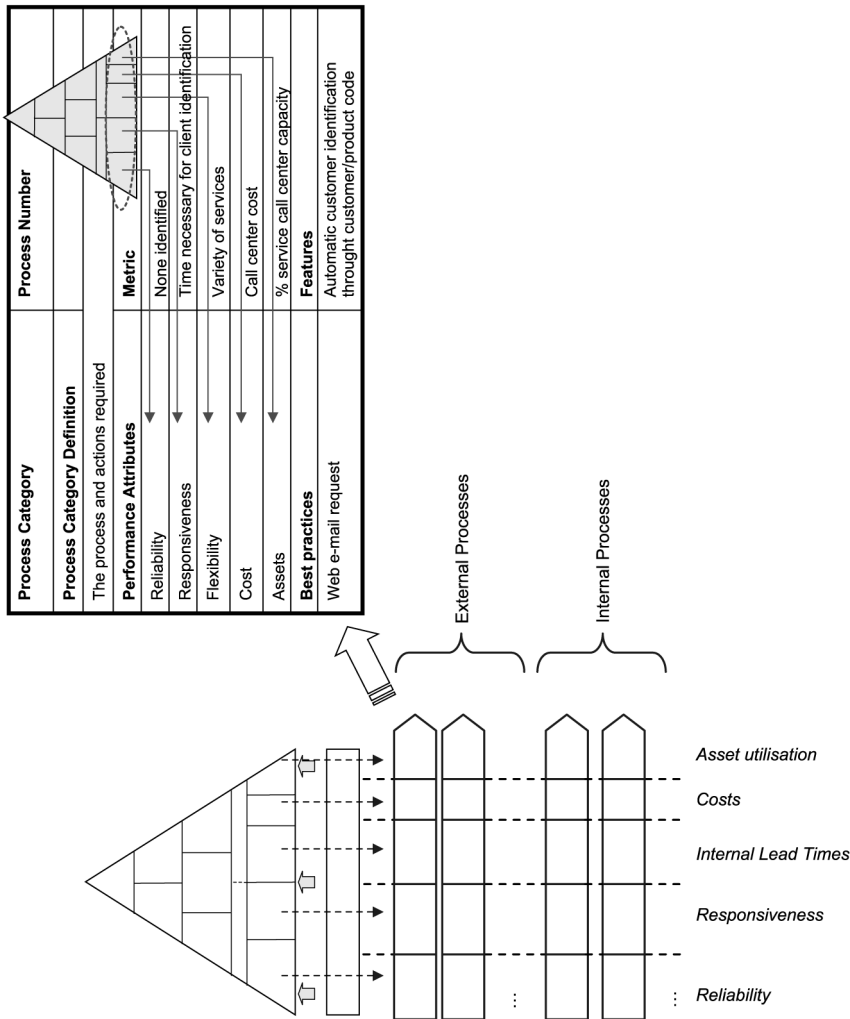


Figure 2.
Alignment with ASCOR model

Within the company, after sales is entitled to carry out a brand fostering strategy mainly focused on customer satisfaction and retention, and pursued through managing four key design leverages:

- (1) Product reliability, functionality, innovation, quality and time to market, in order to enhance company's brand image and reputation, as well as an outstanding customer perception of the product quality.
- (2) Hierarchical dependence of the logistic function on the marketing function, in order to emphasise brand image, reputation importance, customer satisfaction and retention.
- (3) Supply chain configuration efforts, in accordance to the just in time principles.

- (4) Performance measurement and evaluation of the company and of the whole network, coherently with the other strategic and organisational variables.

The vision of after sales service as a leverage for gaining customer retention and satisfaction to increase the “brand image” and to make the product more attractive to the customer, is reflected by specific processes created by Company 1, to drive customer through loyalty. For instance, customer interviews management process is responsible to design, implement, submit and analyse customer satisfaction; claim management, a sub-process of warranty management, focuses on solving customer requests and claims during the product warranty period; communication, a marketing process, is responsible to inform customers about initiatives and promotions of the after sales business unit.

Hundreds of metrics can be found to evaluate service in terms of reliability (e.g. delivery performance used to control the processes of service and order fulfilment management as well as repair and maintenance), responsiveness (e.g. customer calls abandon rate used to evaluate the customer care, response and repair time used to monitor the process of repair and maintenance as well as the customer care one), internal lead times (e.g. diagnosis time for repair and maintenance and fill rate for warehousing support), costs (e.g. cost of picking errors used to monitor warehousing support process) and assets utilisation (e.g. stock rotation index used to control warehousing support and logistics process, technical reports per employee for technical documentation management).

The long-term vision of the company is reflected in many performance indicators implemented to evaluate and measure its service portfolio (e.g. number of services offered, frequency and time to market of introduction of new services), the development of skills and competences of its human resources (e.g. frequency of training courses, number of courses per employee per year), IT and service capacity (number of after sales personnel, number of workers per repair shop, number of installed ramps, number of testers for diagnosis on line, availability of internal tyres centres, number of technical assistance centres) as well as the communication effectiveness along the service supply chain (e.g. frequency of network reports, number of technical reports per month).

Company 2

Company 2 is the Italian branch of one of the world’s leading carmakers, positioned in the premium market niche. The after sales business unit, literally named customer service, produced a turnover of about 55 million of euros in 2003. It depends directly by the general managing director and its organisation can be divided in six main areas: marketing, logistics and distribution, technical assistance, warranty management, customer care and operations areas.

The company follows a service-oriented strategy, pursuing a high customer satisfaction and retention in a short-time perspective. After sales service is seen as a way for increasing influence of intangible items (services) related to the product. From a strategic point of view, the management considers the role of after sales as a business generator. It means that the company supports its profitable growth by working on the strength of its brands, maintained through the profit and a high level of customer satisfaction provided by:

- high quality, technologically innovated, safe and reliable products; and
- an efficient complete set of services, during the whole product lifecycle, able to satisfy any client's requirements or needs.

In accordance with this strategic profile, Company 2 emphasises its performance management on effectiveness measures at every level of the performance Measurement System both at a company and a service network level. The short term-orientation is reflected in numerous adopted KPIs related both to financial measures (e.g. revenues, equity, long term debt, net profit/loss per year, cash flow) and competitive results like volume growth, market share and penetration.

At the process level, the orientation on customer retention drives the company to stress emphasis on relationships with its dealer network. For instance, the network certification is a specific process created in order to control the technical quality provided by its assistance network, while the dealer evaluation has been implemented to ascertain how Technical Assistance Centres (TACs) manage customer relationships and to evaluate the level of customer satisfaction and retention. Several KPIs are adopted by the company to control the after sales process effectiveness: the most relevant ones are customer service perception, customer and dealer satisfaction and the Vendor Relationship Management (VRM) index. Through the submission of questionnaires and phone interviews, the latter indicator has been created to understand the customer perception about service quality provided by dealers: whenever VRM index does not respect the requested targets, corrective actions are taken by the business unit of the company to reorganize the service network. Even though company pays less attention to internal indicators, after sales flexibility and productivity are monitored through two specific indicators: the percentage of variable costs on the overall costs and on the total costs of after sales.

The short-term perspective of after sales service is reflected in many performance indicators used by the company to manage, evaluate and measure front-office processes with an effectiveness focus. Some examples of monitored indicators are:

- Fix-right-first-time indicator used to evaluate the reliability of service and order fulfilment process.
- Call centre abandon rate as a responsiveness indicator created to evaluate customer care.
- Delivery time applied to monitor service and order fulfilment.
- Calls per hour used to measure the internal lead times of call centre activities.
- Value of obsolete spare parts on total spare parts value as a cost indicator used to monitor warehousing and demand planning.
- Customer per employee for measuring the assets utilisation of service fulfilment, network configuration and service planning.

Company 3

Company 3 is an Italian firm operating in the premium segment of motorbike industry, offering a full range of motorcycle models. The after sales business unit, named motorcycle related product (MRP), employs in overall about 50 people and it is responsible for all the activities concerning accessories and sportswear supply (for

instance clothes and motorcycle kit), spare parts distribution and technical assistance. The business unit depends directly on the CEO and has profit and loss responsibilities.

The company, which pursues a product-oriented strategy, aims at creating profits from quality goods and spare parts sales. The focus of the company is on short-term. Though the company pays attention on customer satisfaction and retention, its main purpose is on short-term profitability. From a strategic point of view, it is possible to state that the after sales unit is considered as a cash generator.

At the business level, in order to satisfy the budget (in terms of ROI, ROE, ROS), the efforts are mostly devoted to evaluate and control costs of after sales activities (using indicators like budget variance and average costs). At the process level, the company mainly focuses on productivity and flexibility aspects, while at the operative level the metrics are mainly related to efficiency performances like costs and assets utilisation. Several indicators are managed and controlled to evaluate the service activities with relevance on internal processes (like logistics, technical and warehousing assistance). Though reliability (e.g. fill rate, quantity of requested parts available in stock) and responsiveness (e.g. customer calls abandon rate, mean time to response, mean time of service delivery and spare parts delivery time) are monitored, the company emphasises its measurement on efficiency indicators like internal lead time (e.g. immediate shipment ratio, time for providing spare parts to the network, procurement dispatching time, mean time to repair), costs and assets utilisation (e.g. percentage of warranty repairs on total, number of substitutions, spares consuming, warranty costs). Finally, due to its short-term perspective, Company 3 does not stress the measurement on research and service portfolio, after sales human resources and IT and service capacity.

5. Discussion

The main dimensions of performance measured by each company are mapped through the framework proposed in § 3, as reported in Figure 3. For each company, each section of the diagram, including both performance attributes and after sales processes, is filled with a different shade of grey according to the emphasis given to that specific performance area. Dark grey indicates that the company puts high emphasis on the performance measurement of that area, and that multiple indicators are measured.

From the same figure, it is possible to notice that the companies reviewed as case studies implement after sales performance measurement systems focusing on different aspects. Firms monitor different dimensions, ranging from financial results, to competitive performance, from customer satisfaction and loyalty to process and activities' efficiency, and from lead time to quality.

Also the companies' perspective is different: some companies are more oriented on short-term results, others on a longer term perspective. The monitored aspects are both after sales service results (such as costs, profit, market share) and performance drivers (such as lead time, quality, customer satisfaction).

As inferable also from the analysis of case studies, it is possible to establish a link among the strategic profiles of after sales service (as previously reported in Table I), the definition of key processes in managing after sales business and the relative and consistent emphasis on strategic KPI's and operational metrics:

- *Product support.* After sales is managed by an inter-organisational function committed to maintain the product functionality during its warranty period; there is not a particular focus on specific after sales processes either at the

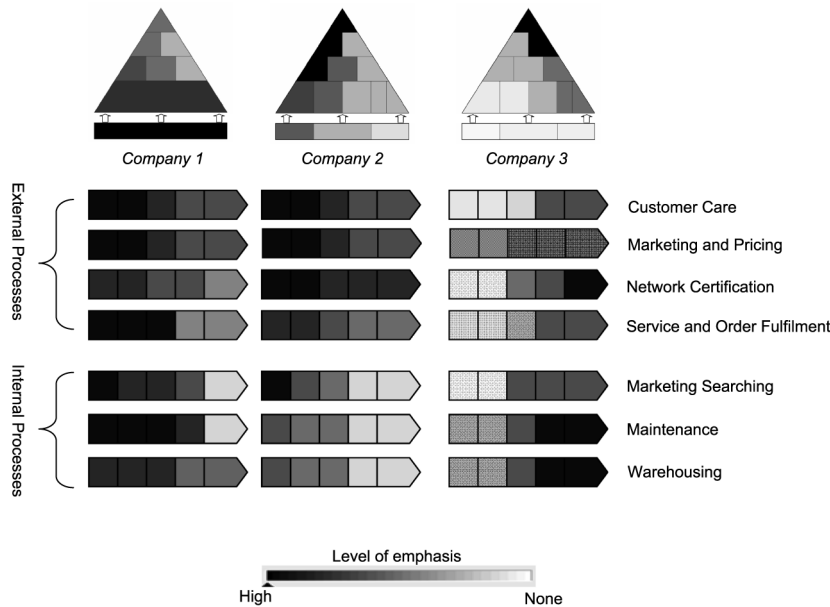


Figure 3.
Alignment with after sales
service processes

company or at the assistance network level, except for those compelled to obligations and legislations in force. In this case, an integrated performance measurement system is not required, since the company can measure its after sales service performances by using a few specific and loosely coupled indicators.

- *Cash generator.* After sales, organised as an inter-organisational function, is considered as a profit centre and must ensure a high level of profit in the short-term perspective; companies belonging to this strategic profile mainly privilege efficiency-based performance drivers of their back-office activities, such as logistics and technical assistance, in order to provide the utmost profitability in the short-term (e.g. spare parts sales and maintenance support). As a consequence, a performance measurement system is mainly oriented toward financial indicators and internal efficiency measures and, from a process perspective, the focus is on internal metrics. In this context, Company 3, which pursues this strategic profile, emphasises the management of internal processes (e.g. maintenance and warehousing) which are monitored through a wide range of measures of efficiency (e.g. fill rate, stock rotation index, warranty cost), in order to control the cost of after sales activities. On the contrary, less emphasis resides on front-office activities. For these activities, such as service and order fulfilment, there is preference towards those indicators apt to monitor and control internal lead times, costs and assets utilisation.
- *Business generator.* After sales is seen as a business unit endowed with profit and loss responsibilities, which must guarantee both a high level of profit and a high customer satisfaction in the short-term. As a consequence, at the operative level the focus is not only on leading logistics and technical assistance processes

but also on managing all the activities related to customer relationship (among others service and order fulfilment, customer care and marketing). According to the pursued strategy, a performance measurement system is strongly related to market results (e.g. market share, penetration) at the business level, while customer satisfaction (e.g. customer satisfaction index, gap indicators), reliability and responsiveness measures are adopted respectively to control the after sales process, its activities and organisational units. Company 2, which follows this strategic profile, covers adequately all the performance dimensions identified by the proposed framework focusing its attention mainly on effectiveness measures, even though a set of performance metrics to monitor economic and financial targets are implemented at the strategic level. The adopted role of after sales reflects the emphasis done on leading processes related to the network management (network certification) and front-office activities (customer care, marketing and pricing) and partially neglecting the internal ones (maintenance and warehousing). Front-office performances are therefore monitored through numerous and various measures of effectiveness. Although all the internal process considered within the ASCOR model are managed, their relevant efficiency is not very well monitored by Company 2 which prefers to stress its performance measurement on effectiveness evaluation.

- *Brand fostering.* The after sales business unit is not a profit centre, but rather an investment centre for excelling in product price, quality and functionality and gaining customer retention and loyalty. This long-term vision reflects the emphasis done on the management of the whole operative processes considering both efficiency and effectiveness performances at every level of the service supply chain, matching the cash and business generator features simultaneously. Company 1 is an example of this approach: it develops a common definition of processes, manages all the activities embedded in the ASCOR model and implements a consistent set of metrics related both to economical and not-economical results. This company, more than the others, develops a structured performance measurement system considering indicators at every level and paying attention on operative indicators neglected by other companies (e.g. call abandon rate, time to market for a new service). The relevance of service network reflects the emphasis put by Company 1 on processes related to lead the supply and service chain (among others: new service design and customer care) which are strictly monitored by an internal organisation (customer and network technical support) to optimize customer retention and loyalty. In addition, the long-term perspective of this company is clearly justified by a wide range of indicators related to research and service portfolio development, IT and service capacity as well as human resources, used by the after sales business development to monitor the degree of development of these specific performance drivers.

All case studies show that the link (explicit or, more often, implicit) between corporate strategic objectives, after sales strategies and goals, after sales performance measures, indicators, processes and after sales organisational configuration is coherent with the model developed. However, apart from Company 1, firms tend to adopt a short-term perspective on performance measurement, considering a budgeting horizon rather than

a strategic planning one. Finally, companies in which after sales is seen as a necessary evil rather than a business opportunity (product support), pursue a cost leader strategy considering after sales not as a service provider but as a mere technical assistance; the relative performance measurement system is more focused on cost indicators.

6. Conclusions and managerial implications

The integrated vision of the framework proposed in this paper would allow enterprises in:

- relating more coherently their corporate after sales strategic and tactical performances with those requested at more operational levels within the service chain;
- identifying the key processes requested to be managed and evaluated; and
- providing specific performance models for monitoring and control the after sales service effectiveness and efficiency assessing the cause and effect relationship between operational drivers and financial and competitive results.

The framework can be used as a descriptive tool, in order to draw a picture about after sales service performance measurement system of a company, and to develop a critical comparison of a set of companies, or a company over time.

Interpretative power may be added to the framework by pointing out drivers that can better explain the differences among companies and/or evaluate the internal consistency of each company's behaviour. With the integration of the ASCOR model, it is possible not only to create an alignment between strategic, tactical and operative performances but also to shift the focus on service-chain processes.

For instance, the main results of the suggested methodology, both in term of processes and performances (summarized in Table III) suggest that companies which follow a business generator approach, pursuing a short-term strategy, require to pay more attention towards those processes directly involved in customer service

After-sales strategy	Alignment	Focus on performances
Business generator	<i>Business:</i> financial results and market <i>Process:</i> customer satisfaction and flexibility <i>Activity:</i> reliability and responsiveness (customer care effectiveness)	Contribution margin Customer satisfaction Dealer satisfaction
Brand fostering	<i>Business:</i> financial results and market share in long-term perspective <i>Process:</i> customer satisfaction and retention <i>Activity:</i> all operative performance attributes, effectiveness and efficiency as a tool for increasing the product sale	Customer satisfaction Service delivery performance Abandon rate (call center) Time to market for a new service
Cash generator	<i>Business:</i> financial results and cost <i>Process:</i> productivity and flexibility and less focus on external features <i>Activity:</i> cost and assets (fill rate, stock utilisation, spare parts management)	Fill rate Stock rotation index

Table III.
Linking strategic objectives with processes and metrics

perception. In order to capture the relevant drivers for gaining customer satisfaction, business generator companies need to stress their performance measurement systems on effectiveness measures, neglecting partially the efficiency ones. On the contrary, companies with a cash generator approach need to focus their efforts on internal processes and stress the performance control on efficiency measures. Finally, companies adopting a brand fostering strategy, characterised by a vision of after sales as a long-term competitive weapon, are requested to emphasise the lowest levels of their performance measurement system stressing the management and the control of every activity constituting after sales services: numerous and various are the performance indicators requested to be applied in order to measure the level of efficiency and effectiveness of the after sales operations.

The results presented in this paper cannot be considered exhaustive and fully extendible to all possible industrial realities. Further development must be carried out in order to:

- enlarge the sample of companies including also some business to business cases to which the model can be applied;
- extend the model to the whole supply and service chain considering the relationships between the different tiers, such as suppliers, manufacturers, TACs and final customers;
- enlarge the framework aiming at considering the aspects traditionally called as empathy (brand of the company, assurance and credibility of front-office personnel) which are hardly measurable with quantitative methods;
- develop the integration with the ASCOR model, including the best practices proposed within the model itself.

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