

Chapter 4

The Automotive Industry: Heading Towards Servitization in Turbulent Times

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Abstract The European automotive industry has been fiercely hit by the recent economic downturn, which has further emphasized the structural overcapacity of production plants and price competition in the sales of new vehicles. Services constitute the main means for original equipment manufacturers (OEMs), authorised dealers, and repair shops, as well as the independent actors, to survive and be profitable, thanks to the size and age of the vehicle fleet. Servitization is thus a strategy pursued by manufacturers and their networks. However, the offering is still dominated by transactional, product-oriented services. Moreover, the relevance of services is still not fully recognized by the service network, which is not completely aware of the impact of servitization on profitability and customer loyalty. In addition, end customers are often not aware of the full range of services available. Further, the perceived importance of services by the network and the final customers may differ. At the forefront of servitization are noteworthy experimentations of sustainable mobility solutions that improve environmental

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impact and quality of life. These are the forerunners of new business models dominated by result-oriented services, where customer get access to vehicles on-demand rather than through direct ownership.

4.1 An Industry on Bumpy Roads

The automotive industry is a major contributor to the European Union (EU) economy, with a turnover of 551 billion €, around 6.5 % of Europe's GDP (ACEA 2012). About 11.6 million people (5.3 % of the EU employed population) are employed either directly or indirectly in the industry. In particular, 3.4 million jobs are related to sales (vehicles and parts) and in-use services, such as maintenance, rent, and lease.

Globally, the automotive market is still growing thanks to the expansion of China and other countries in Asia and South America. In Western Europe, instead, the market is shrinking, thus further emphasizing the structural production overcapacity in the continent. Production figures of 2012 (17.3 million units in Europe, 11.3 million of which were produced in the EU15) are back to the volumes of 2003. The EU hosts 177 production or assembly vehicle plants: 58 % of them are estimated to work under the break-even point (AlixPartners 2013). Such a trend concerns both the passenger-car and the truck sectors. The latter, being business-to-business, suffered particularly during the economic recession from 2007 onwards. Dealers, too, saw their financial performance constantly worsening in recent years, but are striving to survive.

The economic recession slashed the sales of cars, professional vehicles, and trucks. Moreover, it has led to high unemployment rates, especially among young people, which has depressed the propensity to purchase cars in Western Europe. Other trends characterise the EU markets at the social level. Aging demographics are likely to lower the demand for new cars. In addition, younger generations are losing interest in cars: once a priority, they are now less important than smart phones and networked devices (AlixPartners 2013). The increasing trend towards urbanisation, the rising efforts towards sustainable mobility, and the high penetration rate in Western Europe also contribute to stabilizing, or decreasing, the need for cars. In addition, laws and regulations aiming at protecting consumer rights, safeguarding the environment, and pulling down entry barriers have obliged companies to redefine their products, production processes, and organisations. Improved vehicle durability and efforts to meet emissions and safety requirements are just examples.

OEMs (original equipment manufacturers, the vehicle brands) increasingly recur to mergers, acquisitions or alliances in order to survive in such a complex and global market, characterised by heavy costs of research, development, and innovation, along with high fixed costs of production capacity.

4.2 Servitization and the Automotive Industry: An Overview

4.2.1 Why Develop the Service Business in the Automotive Industry

In a context of global competition and decreasing profits from vehicle sales, services are vital for all actors in the automotive industry to survive and increase their business in the long term. In particular, the automotive industry presents several factors pushing towards servitization, in line with what has been advocated by managerial and scientific literature (Baines et al. 2009).

At the economic level, service generates high profits. This is fundamental, since the average sales profitability of passenger cars for OEMs and their dealer network ranges between 0 and 2 %. CLEPA, the European Association of Automotive Suppliers, calculated that, in Germany in 2006, the aftermarket accounted for 23 % of the total revenues in the auto industry, and for 50 % of the total profit (SupplierBusiness 2009). For dealers alone, after-sales services account for between 30 and 70 % of total profit (sources: ICDP and ASAP SMF). In addition, after-sales services for a vehicle are estimated to generate at least three times the turnover of the original purchase. The vehicle fleet is huge: 273.7 million units in the EU27 in 2010 (240 million passenger cars), with an average fleet age of 8.3 years (cars). The stock of cars circulating can therefore secure important and stable revenues over time, whereas the ratio of new cars sold to the vehicle fleet is 1:18.

At the strategic and marketing levels (Vandermerwe and Rada 1988), services may lock in customers to the authorised OEMs networks, through long-term warranties, service contracts, or mandatory maintenances to preserve warranty rights. Proprietary technology and remote information exchange may enable OEMs to lock out competitors that may not have the skills or equipment to service vehicles of other brands, despite the efforts undertaken by EU legislators with the Block Exemption Regulation. Moreover, services are a way to differentiate an OEM offer from those of competitors, and therefore, to sell more vehicles. Services represent a constant connection between customers and the brand, driving customers to dealership and brand loyalty, and repurchase intent. A typical example is the one by Toyota, among the first to introduce a free long-term conventional warranty, thus reinforcing its image of a high-reliability brand. Moreover, with innovations as the DuoTec, a 'fast ordinary maintenance' service, Toyota aims at differentiating itself from competitors by the speed and quality of the services they offer.

In addition, product-support services enable the continuous improvement of product design and quality, through feedback information from the field.

Finally, the environmental and lifestyle aspects should be considered. Running a car generates only around half of the annual carbon emissions that making a new one does (SupplierBusiness 2009). Reduction of environmental impact influences not

only product development but also the definition of new business models of *sustainable mobility*, where the vehicle becomes an appliance aimed to provide a function (mobility). Long-term leasing, car sharing and carpooling substitute product ownership, and also improve the control of vehicles' reliability, and vehicle utilisation, safety, and quality of life. An example is the Car2go mobility concept launched by Daimler in several cities. Cars are available for lease on a pay-as-you-go scheme within the city, 24/7. These solution offerings are at the forefront of servitization in the industry: they entail completely new business models and the involvement of new players (municipalities, providers of utilities, and so forth). Launched as 'experiments', with little impact on the OEMs market and revenues, in the long term they will transform the concept of mobility in the EU. In fact, it has been estimated that the diffusion of such new solutions can reduce the number of cars by about 40 % and distances driven by up to 60 % (Whitelegg and Britton 1999). Moreover, these new solutions will be used in the 'smart cities' of the future.

4.2.2 Services in the Automotive Market: Overview

Based on different studies by ICDP, BCG, and SupplierBusiness, auto services can be valued at around 200 billion € in the EU. Stability of service volumes and their profitability allowed most actors operating in automotive services to survive during the crisis. For instance, in 2008–2010, without the after sales services, the profitability of American dealers would have been mainly negative (NADA 2012), and similar evidence can be found in Europe.

The automotive service supply chain is not vertically integrated, but rather complex and fragmented (Gaiardelli et al. 2007). The OEMs in general do not directly own the product and service channels, but rely on authorised dealers' and repair shops' networks, which display the OEMs' brands and constitute the 'official' channel. However, although vehicle purchasers are bound to resort to the authorised network during the warranty period, the independent channel has the highest market share: 70 % in Poland, 66 % in the UK, around 62 % in Spain and Italy, and slightly over 50 % in France and Germany (source: BCG and ICDP). Independent companies can be small players or large chains, and sometimes they are highly specialised (e.g., on glass or tire substitution). The independent channel shows levels of customer satisfaction very similar to the authorised channel (BCG 2012). The service market was stable in the last few years: fewer kilometres driven by customers and improved part-quality imply longer maintenance intervals, and reduce the demand for traditional services. For instance, the number of after-sales interventions in Italy in 2015 is expected to shrink by 19 % in volumes and 8 % in value, compared to 2009. Moreover, intensified competition also limits prices and increase transparency.

In this context, advanced services are expected to drive profitability in the future, as traditional services may become commodities. Notwithstanding the forces pushing towards servitization, however, the service business in the

automotive industry is still primarily related to parts and traditional maintenance. Financial services and warranty extensions still have a low penetration rate: for examples, compared to 40 % of the US market, warranty-extension penetration ranges between 20 and 35 % in Western Europe. The diffusion of such new services is also introducing new players in the competitive arena: since vehicle repair is one of their main cost drivers, insurers, fleet operators, and leasing firms make special-condition contracts with selected repair shops or networks, in order to lock in customers to these actors for their maintenance interventions.

4.3 A Service-Portfolio Analysis in the Automotive Industry

4.3.1 Service-Portfolio Classification

Scientific literature and anecdotic evidence suggest that companies that are servitizing proceed along a continuum, through incremental stages characterised by different levels of service sophistication (Oliva and Kallenberg 2003; Davies 2004; Davies et al. 2006).

Based on a research carried out in Italy between 2010 and 2012, this section presents an analysis of the servitization level in the automotive industry, through the lens of the service portfolio. The analysed sample includes 36 brands that represent approximately 95 % of the total market: 29 brands belong to the car industry (Alfa Romeo, Audi, BMW-Mini, Chrysler, Citroen, Daihatsu, Fiat, Ford, Honda, Hyundai, Infiniti, Jaguar, Lancia, Lexus, Maserati, Mazda, Mercedes, Nissan, Opel, Peugeot, Porsche, Renault, Skoda, Subaru, Suzuki, Seat, Toyota, Volkswagen, Volvo), and 7 brands to the heavy-truck segment (DAF, Iveco, MAN, Mercedes, Renault Truck Scania, and Volvo Trucks).

The research was conducted based on publicly available information collected from company websites and their brochures. Services were listed in a table and then mapped into a scheme (reported in Fig. 4.1) that critically combines three classification dimensions, namely:

- *the offering focus*, that moves from ensuring the vehicle availability and functionality to supporting the end-users' processes and activities (Mathieu 2001; Windhal and Lakemond 2010). Moving from product—(vehicle) to process—(driving) and people-focused (i.e., driver) services, the intensity of the relationship (customer and provider's involvement and commitment), and the service customisation increase.
- *the nature of interaction* between the customer and the service provider (Oliva and Kallenberg 2003; Penttinen and Palmer 2007), either transaction-based or relationship-based. The nature of the interaction entails different ways to price the service: from a mark-up for labour and parts (transaction-based approach),

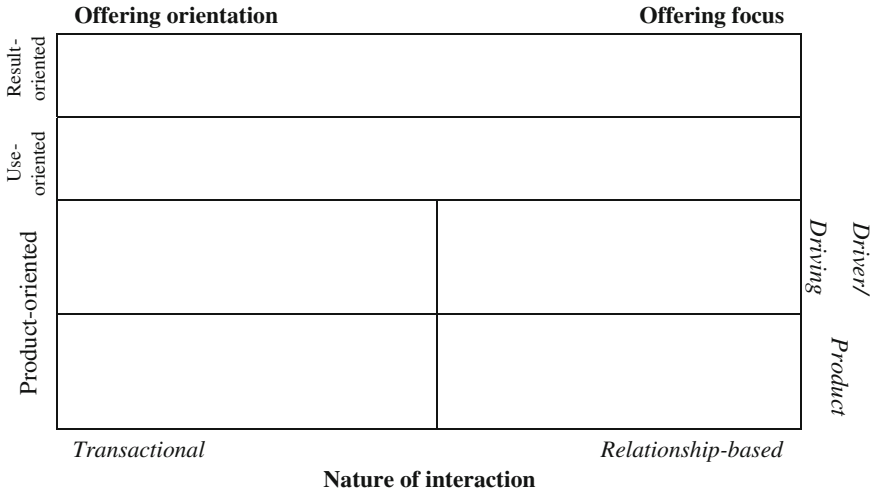


Fig. 4.1 The adopted schematic representation of services

to a fixed price covering all services over an agreed period (relational approach), and the risk taken by the provider dramatically increases.

- *the offering orientation* dimension, which groups services into three types: product-, use- and result-oriented services (Tukker 2004).

Services proposed in the car and heavy-truck industries are listed in Table 4.1. Most of the services enhance the vehicle features or support vehicle availability and reliability. Other services exemplify how automotive companies have been diversifying their offerings to help customers in managing their vehicles during the whole lifecycle: they are, for instance, vehicle upgrading and outfitting, vehicle cleaning, the provision of refurbished spare-parts, and initiatives to support the management of the vehicle end of life.

Most services are characterised by different options (or features) that the customer may choose, concerning the duration, guaranteed performance, payment conditions, and so forth. This further shows the efforts made by car and heavy-truck OEMs to identify solutions to the needs of different customer segments. For example, repair and maintenance activities are promoted with a wide number of warranty forms and are available in a large set of alternatives, ranging from the provision of traditional support to the delivery of express (fast-fit) services. The activities can be associated with a 24/7 workshop opening, and/or can include road assistance in case of emergency rather than an at-home direct assistance.

Services are not just offered to improve vehicle performances but also to enhance the customers' operations, or to improve the efficiency or effectiveness of their activities or advance their skills. Sport- and eco-driving courses, solutions for mobility of disabled persons, training and consultancy for fleet maintenance and management, and spare-parts management optimization are examples of the large range of advice, training, and consultancy services offered by car and heavy-truck makers.

Table 4.1 Services offered in the car and heavy-truck industries

Service description	Car	Heavy truck
<i>Transactional services for product support</i>		
24/7 repair and maintenance services	✓	✓
Body, glass, tire, maintenance, and repair	✓	✓
Express maintenance/repair (fast-fit)	✓	✓
Fly & fit	✓	✓
Onsite diagnostic, maintenance, and repair	✓	✓
Product dismantling management	✓	✓
Product upgrading/outfitting	✓	✓
Refurbished spare-parts	✓	✓
Repair and maintenance during warranty period	✓	✓
Road assistance	✓	✓
Service for alarm systems	✓	✓
Summer/winter check-ups	✓	✓
Take back	✓	✓
Vehicle cleaning	✓	✓
Vehicle preinspection/precheck-up	✓	✓
<i>Relationship-based services for product support</i>		
Extended warranties	✓	✓
Remote monitoring and diagnostics	✓	✓
Repair and maintenance long-term contracts	✓	✓
Spare-parts supply and maintenance packages (all inclusive)	✓	✓
Spare-parts supply and maintenance packages (for old vehicles)	✓	✓
Telematics assistance	✓	✓
<i>Transactional services for customer activities (driver/driving)</i>		
Courtesy vehicle	✓	✓
Driver accommodation and repatriation in case of accident	✓	✓
Driver accommodation during repair activities	✓	✓
Financial support (in case of accident, emergencies, etc.)	✓	✓
Healthcare assistance in case of accident	✓	✓
Help desk (information/emergency)	✓	✓
Insurance packages	✓	✓
Legal support in case of accident	✓	✓
Merchandise	✓	✓
Online documentation (products, accessories, merchandise, parts)	✓	✓
Online monitoring (tracking) of repair activities	✓	✓
Services for mobility of handicapped	✓	✓
Sport- and eco-driving courses	✓	✓
Visibility on workshop activities	✓	✓
<i>Relationship-based services for customer activities (driver/driving)</i>		
Credit/debit card	✓	✓
Fidelity card	✓	✓
Financing scheme for product repair services	✓	✓

(continued)

Table 4.1 (continued)

Service description	Car	Heavy truck
Financing scheme for product sale	✓	✓
Fleet management services (in outsourcing)	✓	✓
Fleet management training and consultancy	✓	✓
Support for maintenance activities and spare-parts management (consultancy) for customers with own workshops		✓
Support for maintenance activities and spare-parts management (training) for customers with own workshops		✓
Web community services (app, social network, etc.)	✓	✓
<i>Use-oriented</i>		
Leasing	✓	✓
Rental (short term)	✓	✓
Rental (long term)	✓	✓

Services may also be offered in packages. Packages are developed to support the physical product (e.g., summer/winter check-ups or special offers for old vehicles), or to ease the management of customer mobility (e.g., ‘all-inclusive’ maintenance programs including several services in case of accident, such as mobile workshop assistance, towing, courtesy cars, travel and hotel expenses, return home or onward journey, picking up the vehicle for repair, vehicle repatriation, and all necessary information support). Service packages are also provided to safeguard the value retention of customers’ fleets. In such cases, packages usually consist of leasing and rental schemes (i.e., advanced service offerings created to reduce asset obsolescence and flexibility, and to preserve customers’ working capital, without transferring the vehicle ownership to customers) that may be matched with maintenance, financing, training, and business consultancy contracts.

In addition, car sharing and carpooling are two types of use-oriented services offered in the passenger vehicle sector. Generally, these services are provided by third-party companies or joint ventures that involve the OEMs and their dealer/workshop network as vehicle, spare-parts, and maintenance providers. For this reason, these services are not taken into consideration in the quantitative analysis reported in this section.

It has to be noticed that the list in Table 4.1 does not include result-oriented services. This testifies that notwithstanding the recent efforts, the sector is still strongly orientated towards ‘traditional’ services. However, a transition from use-oriented to result-oriented services is starting, based on the evolution of the packages described above, evolving the lease/rental plus maintenance packages, into pay-per-use schemes (e.g. the CharterWay Services by Mercedes-Benz).

Not all the services listed in Table 4.1 represent a direct source of revenues for the OEMs or the networks. In some cases they are proposed only to meet customers’ needs, in order to improve the business in the long term. For example, some complementary services are available free of charge, just to increase

customers satisfaction and loyalty and/or to attract potential new customers. In other cases, offering such services is considered strategic for the overall network sustainability, because they boost sales of collateral services. For example, repair and maintenance services not covered by a contract influence the revenues of the service network but are not a direct source of cash for carmakers. However, they boost the spare-parts sales business: the higher the volume of maintenance services provided by the network, the higher the OEM's revenues coming from sales of its own branded new and refurbished parts.

4.3.2 Findings in the Car and Heavy-Truck Industries

The analyses are based on the following indexes:

- number of services offered,
- service-portfolio share (average number of services belonging to each area over the total number of offered services),
- service diffusion index (percentage of companies offering on average a generic service in each service category), and
- average differentiation level among brands [reported as 'Low' (L), 'Medium' (M) or 'High' (H)].

Results are illustrated in Figs. 4.2, 4.3, 4.4 and 4.5.

Figure 4.2 concerns the passenger-car industry, and shows the number of services offered on average in the different classes (in brackets the total number of services in each class). Summing the figures for all classes, the average number of services offered is 28.3 out of 44 (64 %). The high number of services that support the driver and its activities (9.4 transaction-based and 4.3 relationship-based services), suggests that carmakers seek to differentiate themselves through the dematerialisation of their service portfolio. However, the emphasis on tangible elements remains central. On the contrary, only few services (e.g., credit/debit card and Web community services) are purely customer-oriented and independent of the vehicle utilisation.

Figure 4.3 reports the diffusion index in the car industry (i.e., the percentage of companies offering, on average, a generic service in each class). In brackets, the same index is reported, computed only for the subset of the most-offered services in each class. Comparing the two indexes within each class, a polarization of the portfolio emerges (except for the use-oriented services) around a set of services offered by nearly 100 % of companies, and a set of services with a very low diffusion (often coupled with a greater degree of novelty and differentiation). In fact, 20 out of 44 services are offered by more than 90 % of the sample: on the contrary, 6 services are offered only by one or two brands. They belong to both the transaction-based and the relationship-based categories. They are explicitly designed to reduce waiting time and increase flexibility of repair and maintenance services (e.g., Fiat's 'fly and fit' or Toyota's 'Duo-Tech' express maintenance), or

		Offering orientation	Offering focus		
Use-oriented	Result-oriented				
	Use-oriented	2.1 (3)			
Product-oriented	Driver/Driving	9.4 (13)	4.3 (7)		
	Product	8.6 (15)	2.9 (6)		
		Transactional	Relationship-based		
		Nature of interaction			
		Car industry		(...) n ^o . of services offered in the segment	

Fig. 4.2 Car industry: average number of services offered by the sample in each class (in brackets, the overall number of service in the class)

support the brand identity by creating new experiences (e.g., the Porsche Club or the Maserati Experience) or to respond to the increasing societal concern about natural resource depletion and environmental degradation as ecomaintenance service programs, delivery of refurbished spare-parts, and integrated packages for green mobility (e.g., Peugeot ‘Mu’, Daimler ‘Car2go’).

Figure 4.4 concerns, instead, the heavy-truck industry, and reports the number of services offered, on average, in the different classes (as in Fig. 4.2 for passenger cars). Summing the figures for all classes, the average number of services offered is 31.4 out of 42 (75 %): the portfolio share is thus higher than in the car industry (28.6 or 64 % of services).

The portfolio is mainly made of product-oriented services (11.0 transactional and 4.9 relational services). This finding differs from the car industry, and reflects a market structure mainly composed by clients who are, at the same time, owners and drivers of a single vehicle. The factors driving these customers to choose a specific brand are reliability, comfort, and quality. Therefore, they are mainly interested in technical and tangible services.

Truck makers are also developing new alternatives and packages to support their customer processes and business. This shift reflects a gradually growing interest of customers for innovative solutions that enhance their operations and improve their business performance. For instance, new services offer the possibility to manage (postpone and defer) the payments of operating costs (e.g., fuel, tolls, repair, maintenance, and spare parts) thanks to special debit card or full maintenance contracts priced on the basis of the use and mileage of the truck.

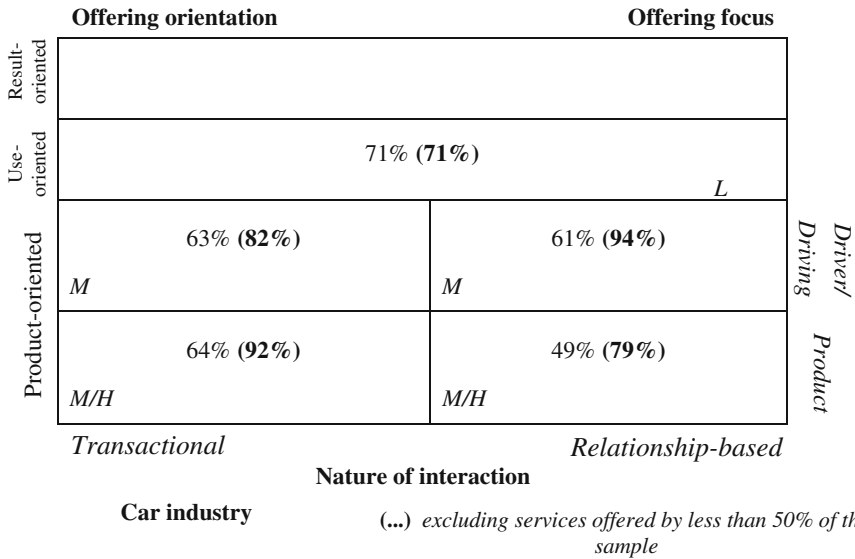


Fig. 4.3 Car industry: service diffusion and differentiation indexes

Figure 4.5, finally, reports the service diffusion index in the truck industry (i.e., the percentage of companies offering on average a generic service in each class). In brackets, the same index is reported, which is computed only for the subset of the most-offered services in each class.

The diffusion level is high in all classes and generally greater than in the car industry (Fig. 4.3). In particular, the high diffusion of relationship-based services reflects the requirements of large clients such as logistic transport enterprises managing truck fleets, that prefer long-term solutions that support their operations rather than over-reactively purchasing product-related services.

Comparing the two indexes (overall and for the highly offered subset) within each class, no large differences emerge, contrary to the car industry (with the exception of use-oriented services).

4.4 The Downstream Service Chain: Dealers and Customers Perspectives in the Truck Industry

In a complex supply chain such as the automotive one, an effective servitization strategy requires the coordination and integration of the different actors involved (Cohen et al. 2006). Dealers and workshops play a significant role in service delivery, and represent the connection between OEMs and customers.

As previously highlighted, services contribute significantly to the strategic, competitive and financial results of the automotive industry players. However,

		Offering orientation		Offering focus			
Result-oriented	Use-oriented	1.3 (3)				Driver/ Driving	Product
		7.5 (13)		6.5 (8)			
Product-oriented	Use-oriented	11.0 (14)		4.9 (6)		Driver/ Driving	Product
		<i>Transactional</i>		<i>Relationship-based</i>			
Nature of interaction							
Heavy-truck segment				(...) <i>n</i> ^o . of services offered in the segment			

Fig. 4.4 Heavy-truck industry: average number of services offered by the sample in each class (in brackets the overall number of service in the class)

		Offering orientation		Offering focus			
Result-oriented	Use-oriented	63% (85%)				Driver/ Driving	Product
		69% (81%)		81% (89%)			
Product-oriented	Use-oriented	79% (83%)		79% (85%)		Driver/ Driving	Product
		<i>L</i>		<i>L</i>			
		<i>Transactional</i>		<i>Relationship-based</i>			
Nature of interaction							
Heavy-truck segment				(...) <i>excluding services offered by less than 50% of the sample</i>			

Fig. 4.5 Heavy-truck industry: service diffusion and differentiation indexes

services are not yet recognized as a relevant source of competitiveness and profits by many dealers because they require a significant change in the strategic, organisational, and managerial approaches. In particular, the cultural shift towards

a thorough customer-orientation represents a barrier to the servitization of service networks that are still characterised by a product-centric focus.

A key factor stands in the service-portfolio development and delivery (Cohen et al. 2006): however, the identification of the set of services most appropriate for a single customer or a customer segment is not so obvious. Offering too few or too many services reduces quality levels and profits. Moreover, an excessively customised service-portfolio may be too costly to deliver.

Based on these premises, this section presents the results of research carried out in the Italian heavy-truck industry, aiming at understanding the attitudes of customers and service networks towards servitization. The research, based on two surveys, involved 254 authorised dealers and repair shops, and 207 customers of the main brands operating in Italy (Gaiardelli et al. 2011). The research, on the service-network side, addressed: (1) the kind of services offered by dealers and workshops, (2) their perception about the interest of customers in different services, and (3) the perceived relevance of services for dealers'/workshops' profitability.

The customer survey addressed instead: (1) the customers' attitudes towards the utilisation of different services and (2) the elements that mainly influence their attitudes.

4.4.1 The Service-Network Perspective

The sample is composed by a 69 % of workshops and 31 % of dealers (carrying out both sales and after-sale activities). Companies were clustered around the extension of their service offerings and their attitude. The three groups obtained are described in Table 4.2.

In addition, research findings show that firms that operate both in product sales and after-sales segments that belong to a mono-brand network are more willing to offer a wide range of services. They also recognize the positive impact of services on company profitability in the short (higher and more stable margins) and long term (effect on customer loyalty). It seems that a positive relation occurs between the width of service offer and the awareness of impact of services on corporate performance. Moreover, mono-brand dealers find fewer difficulties in offering a wide range of services, probably as they can benefit from the OEM's support for marketing initiatives, advices, training, and consultancy. Additionally, a correlation between the number of services offered by the OEM and the number of services provided by the network emerges. In other words, *the wider the heavy-truck makers' service portfolio is, the higher the diffusion is in their network*. Such evidence confirms the importance of having a coordinated and top-down organisational and managerial support delivered by the OEMs to their networks, to achieve fully the benefits of service-business development. However, the shift towards a service-oriented and customer-centric business model asks networks to give up the traditional vision focused only on technical

Table 4.2 The attitude towards services of heavy-truck service networks

Cluster	Cluster name	Main characteristics
#1	<i>Low service attitude</i>	This group is mainly composed of workshops that offer a quite limited number of product-related services, e.g., repair and maintenance. Companies belonging to this group do not see market opportunities in other kinds of services
#2	<i>Attitude towards product-related services</i>	This group of companies shows a medium service attitude and believes their customers have a medium-high interest in services. The cluster includes both workshops and dealers, which mainly offer services supporting product reliability and availability. These firms also provide other product-oriented services addressing drivers' and driving needs
#3	<i>High service attitude</i>	This group is characterised by a high service attitude and an estimated high customer interest for services. It includes both workshops and dealers that offer a wide array of services belonging to all service categories

issues and/or on selling products, and to improve managerial and relational competences.

4.4.2 The Customers' Perspective

First, the set of services provided in the heavy-truck industry has been divided in four clusters concerning their degree of diffusion and use in the market, as summarized in Table 4.3.

In exploring the customer viewpoint, it has been noticed that most of the services offered are little known and used. In particular, the attitudes towards services can strongly differ among customers, as emerged in a second cluster analysis. The analysis identifies three categories of customers according to their awareness and interest towards the service offerings. The clusters, reported in Table 4.4, are described considering (1) their nature (they can be truck owners and drivers or just owners); (2) the number of owned vehicles: small fleet (less than 10 vehicles), medium fleet (10–50 trucks), and large fleet (50 or more trucks); and (3) the kind of route driven (international, national, regional, and local/off-highway route).

From a more in-depth analysis of the aforementioned clusters, it emerges that the size of the owned fleet seems to influence customers' knowledge of services, whereas the driven route influences the importance given to services. Actually, customers with a medium-sized fleet know a larger number of services, whereas players who drive national and international routes perceive more clearly the value added to their businesses by services.

The research shows that some divergent perceptions of the importance of services occur between customers and the service network. In fact, dealers and workshops emphasize product-support services, which are considered strategic and

Table 4.3 Service diffusion in the heavy-truck market

Cluster	Cluster name	Main characteristics
#1	<i>Services with a limited diffusion and use</i>	This group consists of services that are mainly intangible, and characterised sometimes by transactional interactions, sometimes by relational approaches. Because of their complexity, they are often delivered by the OEM. They are rarely promoted and provided by the service network directly, because they require significant investments, and are characterised by a low level of utilisation. Examples are legal and financial support, driver accommodation and repatriation in case of accident, online monitoring (tracking) of repair activities, support for maintenance activities, and spare parts management (training)
#2	<i>Services with a medium diffusion and use</i>	This group mainly consists of product-oriented services aimed to support vehicles' reliability and availability. The group includes also some relationship-based services for product support, delivered together with the vehicles to create a long-term loyal relation with customers, such as telematics assistance or vehicle remote monitoring and diagnostics. In this cluster also included are training, information, and promotion services delivered by workshops to create long-term relations with their customers. Examples of such services are service for alarm systems, fleet management training and consultancy, support for maintenance activities and spare-parts management (consultancy) for customers with their own workshops, help desk (information/emergency), spare parts supply and maintenance packages (for old vehicles), and extended warranties
#3	<i>Services with high diffusion and medium use</i>	Services included in this group are created to simplify customer operations and financing schemes. They are characterised by a medium use by customers, but a high level of diffusion among service networks. Examples are summer/winter check-ups, long-term contracts for repair and maintenance, pre-check-up, visibility on workshop activities, credit/debit cards, online documentation, and 24/7 repair and maintenance services
#4	<i>Services with high diffusion and use</i>	This group comprises mainly traditional after-sales services, which customers expect to find in all workshops. Offered by almost all sample companies, and used by a quite large number of customers, these are mainly tangible and transactional product-support services, which do not suppose a long-term relation between customers and workshops. Examples are refurbished spare-parts, road assistance, and express maintenance/repair (fast-fit)

thus are promoted towards customers. However, customers consider such services to be commodities. On the contrary, there are services, focused on training, information, and supporting to the customer's business, which are little known and promoted, even though they are strategic for a customer segment.

Moreover, even though services are considered by OEMs as strategic for competitive and financial performance, sometimes the service network is not aware of the contribution that increased service volumes can give to their profitability. The main reasons for the lack of knowledge of services by customers can be found in ineffective communication and promotion of services to final customers, by OEMs, and in the low degree of servitization of the assistance network, focused mainly on traditional after-sales services. Such evidence highlights that

Table 4.4 The attitude towards services of heavy-truck customers

Cluster	Cluster name	Main characteristics
#1	<i>Low awareness and importance attributed to services</i>	This group comprises customers with little knowledge of offered services, who attribute low importance to services, except for repair and maintenance. They are mainly owners of small fleets who drive local routes
#2	<i>Medium awareness and importance attributed to services</i>	Mainly owners of small fleets who drive national routes, these customers know a significant number of services and give them a medium-high importance. They are interested especially in product-support services such as repair and maintenance but often also use customer-based services
#3	<i>High awareness and importance attributed to services</i>	This cluster comprises customers who know very well the service offerings and consider services very important for operating their vehicles. They are mainly owners of medium fleet, and they drive international routes

the OEM and the service network have to collaborate and coordinate both to design and to promote a service offering that is more consistent with customers' needs, and to concur jointly in defining and developing a servitization strategy. However, a shift in the mindset is necessary for not only OEMs and service networks but also for customers, who generally are not quite conscious of the potential relevance of services for improving their businesses. For a customer, a greater emphasis on services means to place value not only on owning a physical product but also on having a need met by using different services.

Finally, our findings could be influenced by the analyzed context, Italy, where a strong culture of product ownership is widespread. The success of a service offer in the market is highly dependent on being sensitive to the culture in which it will operate. Indeed, service solutions have been more readily accepted in the communal societies as Scandinavia, the Netherlands and Switzerland.

4.5 Conclusions

The European automotive industry is living through tough times. Demand for new vehicles has dropped dramatically, especially in the truck sector, after 2007. Decline and stagnation have caused the structural overcapacity of production plants to reach unprecedented levels, and put at risk the survival of companies, including component suppliers, vehicle manufacturers, dealers, and repair shops (authorised or independent). Concentration and alliances are being pursued as a way to improve the bottom line of the different actors.

Services are actually allowing companies to survive in these hard times, and servitization seems to be an obliged evolution. New financial, strategic, and environmental opportunities emerge both for OEMs and their service networks through the development of this new paradigm, based on the move from a product-orientation

towards the provision of customer-focused bundles of products and services. Customers achieve important advantages from servitization, as they can benefit from a wide array of new customised alternatives to fit their needs.

The results of the empirical research, however, show that the transition to servitization is far from being achieved. A progressive diversification and enlargement of service portfolio is occurring, and several companies have started a process of dematerialisation of their product service-portfolio, consistent with a servitization strategy. However, OEMs, both in the car and heavy-truck sectors, still mainly offer traditional product-oriented services and rarely consider result-oriented ones.

The vertical integration of the service chain is low, because OEMs rely on third-parties dealers and workshops. Stronger coordination is acknowledged as an important element needed to achieve a higher degree of servitization, through an enhanced offer of relationship-based, use-oriented services. This evolution may allow the OEMs and their authorised networks to lock out the competition by the independent aftermarket channel, which holds the largest share of the market and reaps most of the profits. However, authorised workshops and dealers are not fully aware of the role of services for firms' profitability and competitiveness. A main obstacle can be acknowledged in the difficulty faced by OEMs and service networks in perceiving the difference between offering 'the core physical product' and the 'product-service' bundle, and in underestimating the strategic, tactical, and operational challenges entailed by this transformation. Besides that, customers have to change their mindset towards a greater emphasis on having a need met, instead of owning a vehicle.

In fact, the picture is very complex and dynamic: technological and normative evolutions that shape the vehicle of the future may create unprecedented opportunities for services. Moreover, urbanisation, political pressure over reduced environmental impact, and the evolution of lifestyles shape the need for *sustainable mobility*, where mobility instead of vehicle ownership is required by customers. Long-term leasing, car sharing, and carpooling are at an experimentation stage, but may in the future define the next revolution of the automotive sector.

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References

- ACEA—European Automobile Manufacturers Association. (2012). The automobile industry pocket guide.
- AlixPartners. (2013). Automotive Outlook—AlixPartners Global automotive study.
- Baines, T. S., Lightfoot, H. W., Benedettini, O., & Kay, J. M. (2009). The servitization of manufacturing: A review of literature and reflection on future challenges. *Journal of Manufacturing Technology Management*, 20(5), 547–567.
- BCG—The Boston Consulting Group. (2012). The European Aftermarket Landscape. Customer perspective, market dynamics and the outlook to 2020, July 2012.
- Cohen, M. A., Agrawal, N., & Agrawal, V. (2006). Winning in the aftermarket. *Harvard Business Review*, May 2006, 129–158.
- Davies, A. (2004). Moving base into high-value integrated solutions: a value stream approach. *Industrial and Corporate Change*, 13(5), 727–756.
- Davies, A., Brady, T., & Hobday, M. (2006). Charting a path towards integrated solutions. *MIT Sloan Management Review*, 47(3), 39–48.
- Gaiardelli, P., Saccani, N., & Songini, L. (2007). Performance measurement of the after-sales service network—evidence from the automotive industry. *Computers in Industry*, 58(2007), 698–708.
- Gaiardelli, P., Pezzotta, G., Resta, B., & Songini, L. (2011). Controllo dell'efficienza e dell'efficacia della rete post-vendita (efficiency and effectiveness of heavy-truck assistance network), ASAP SMF, Automotive Section, ISBN: 978-88-89555-21-7.
- Mathieu, V. (2001). Service strategies within the manufacturing sector: Benefits, costs and partnership. *International Journal of Service Industrial Management*, 12(5), 451–475.
- NADA—National Automobile Dealers Association. (2012). NADA Data 2012, State-of-the-industry report, www.nada.org/nadadata.
- Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management*, 14(2), 160–172.
- Penttinen, E., & Palmer, J. (2007). Improving firm positioning through enhanced offerings and buyer-seller relationships. *Industrial Marketing Management*, 36(5), 552–564.
- SupplierBusiness Ltd. (2009). The European Aftermarket report.
- Tukker, A. (2004). Eight types of product-service system: Eight ways to sustainability? *Business Strategy and the Environment*, 13, 246–260.
- Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), 314–324.
- Whitelegg, J., & Britton, E. E. (1999). Car sharing 2000—A hammer for sustainable development. *World Transport Policy and Practice* 5(3), 1–23.
- Windahl, C., & Lakemond, N. (2010). Integrated solutions from a service-centered perspective: Applicability and limitations in the capital goods industry. *Industrial Marketing Management*, 39(8), 1278–1290.