

Changing the rules of the marketing game

Towards Product Service Systems supported by Interaction and relationship management practices

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Product Service Systems (PSS) have been proposed as an environmentally efficient business model. The benefits of PSS include support of dematerialization and incentives for companies to design more efficient products with longer life cycles. In spite of the attractiveness and environmental effectiveness of PSS, much still needs to be done to make of it a viable business model. There are limitations such as the rebound effect for example. Key constraints to the implementation and operation of PSS include difficulties in managing diverse networks of providers as PSS are made of heterogeneous organizations. To address this limitation, this paper suggests that the Interaction theoretical framework, first introduced in the 80's can inform these network management activities. Marketers can build effective relationship and network management practices to improve the design of effective PSS'. Marketing educators should support further evolution and adoption of PSS.

Introduction

This paper takes the move from an influential paper by Vargo and Lusch (2004) on a shift of marketing towards service centred logic, advocates the need for a shift towards integrated goods and services, or Product Service Systems (PSS), and proposes relationship and network management as a solution to the difficulties providers encounter in managing a provision delivered by a network of economic operators, according to Evans et al (2007). It examines enabling and constraining factors to the adoption of business models based on PSS. PSS is defined as a

“System of products, services, supporting networks and infrastructure that is designed to be: competitive, satisfy customer needs and have a lower environmental impact than traditional business models” (Mont, 2001:239).

The type of PSS our research examines is one based on the use, rental, sharing or leasing of products as opposed to their purchase. This model is advocated by some, e.g. Manzini and Vezzoli (2002), because it is more sustainable compared to the traditional ones based on exchange (Mont, 2001). Manufacturers and marketers would be more efficient than consumers in maintaining good operating conditions for their products, ensuring that they feature up to date technology, and in taking responsibility for products at the end of their life cycle. Consumers orientated PSS have already been put into practice by companies such as *City Car Club* (<http://www.citycarclub.co.uk/>), which operates a number of cars used by drivers for a limited time using a smart card. Other provisions targeted at consumers include shared bicycles, available in various European cities. PSS are currently limited to small market niches. It is proposed that this business model can assist achieving a shift towards a low carbon economy, advocated by many environmental experts and promoted by EU Governments. The research investigates how this business model can become a new paradigm of marketing, and how marketing practices can address some of its limitations.

Rationale

The theoretical proposition of a shift from a transaction to service logic based marketing advocated by Vargo and Lusch (2004) and Grönroos (2007), and to a service economy without ownership advocated by Hawken et al (1999) has already been implemented in business to business contexts. Examples include *Interface Inc* (www.interfaceglobal.com/), which lease modular carpets rather than selling them and *Xerox*, who lease photocopiers. Less known are PSS provisions in consumer markets, but some exist, such as *City Car Club* (www.citycarclub.co.uk/), a company which operates cars which are used by drivers for a limited time using smart cards. These types of PSS provisions can be proposed as a blueprint of a more sustainable marketing. These examples, however, interest very small market niches, especially in the consumer sector. The mass market is still characterized by ownership. For their part, consumers might not be enthusiastic about ownerless consumption (Mont, 2001). The proposition that customers are more interested in use than ownership of products inferred by Vargo and Lusch (2004) has not been adequately researched. This business model has not received the attention it deserves by the marketing community, although there is plenty of literature on the combination of product and services elements, some of which mentions PSS and marketing, see for example Sakao et al (2009), Pawar et al (2009) and Spring and Araujo (2009). The proposition of this business model requires understanding of the constraints to its implementation. This research aims at identifying constraints and enablers, and at offering recommendations for policy makers, business managers and academics for the adoption of PSS and a transition to a low carbon economy.

Shifting towards a “Service Logic” in Marketing

The evolution of marketing has seen a mutation from a discipline based on the theory of exchange (Kotler, 1972), where the role of marketing is to support continuous production by business of goods to be sold to customers, towards one where service elements are a very important component of a business offering (Grönroos, 1982; 1996; Vargo and Lusch, 2004). Marketing is about the promotion of a combination of products and services to satisfy consumer needs (Vargo and Lusch, 2004). The “historical” distinction between service and goods marketing as two separate disciplines (Shostack, 1977) is now obsolete (Vargo and Lusch, 2004). Value is not defined by the ownership of goods and products, but by the benefit which arises from the use of these products (ibid). For example cars and railways supply customers with the same type of value, i.e. transport from A to B, but cars, unlike trains, are owned by their users. It can be argued that ownership of goods such as a car satisfies other needs, such as sense of achievement and ability to project status (ibid.). Nevertheless it needs to be recognized that the use of a car involves the use of many service components, such as motorways, insurance, servicing, fuelling, etc., without which a car would be useless. In this picture, it is sobering to reflect on the fact that the owners of a Porsche sport car, a Sport Utility Vehicle (SUV) and a cheap economy car may derive the same low value from their asset, i.e. arriving late to their destination because they have been blocked in a traffic jam. An important proposition by Vargo and Lusch (2004) is the idea that value is defined and co-created by customers as part of a relationship of trust, and therefore it is far more customer centric than a marketing model based on exchange. The recognition of value as a “bundle” of products and services, where a product is merely an appliance to support the delivery of a service (Vargo and Lusch, 2004) is completed by the suggestion that users of these products, when deriving value from them, do not necessarily need to own them (Hawken et al, 1999). It is suggested that if people “shared”, “leased” or “rented” in proportion to the use they make of them this would reduce the impact on the environment of both business and consumption by reducing products proliferation. A service economy, or functional economy, is a means to achieve sustainability (Mont, 2001).

In this context, *Sustainable Marketing* (Fuller, 1999) or *Sustainability Marketing* (Belz and Peattie, 2009) represent “revamps” of the discipline of Marketing as a more sustainable business process. Sustainable Marketing proponents advocate a change in paradigm, to match the radical change needed in business and consumption to make economic activities more sustainable. There is a problem at the root of the very discipline of marketing: its function is to promote consumption often to unsustainable levels (Peattie, 1999; Peattie and Crane, 2005). This problem has even inhibited some of the main proponents of this new marketing from characterizing it as sustainable: Belz and Peattie (2009), in their book *Sustain-*

ability Marketing, elect to give the new discipline a name made of the pairing of the two disciplines – Marketing and Sustainability to signify that marketing itself cannot be sustainable. The evolution of capitalism as a system and as an ideology, and the obsession with growth has caused, or at least contributed to, the decay of the environment (Balakrishnan et al, 2003). Consumers have been encouraged and conditioned to acquire more and more products and assets, and to waste resources by disposing of perfectly good products in order to own the most up to date ones (ibid.). This consumerist model is a wasteful one (ibid.), in a world where a limited number of people live to high standards, whilst large numbers of people live below the poverty line.

Consumers purchase goods such as cars, which have very high costs of running and maintenance, and high purchase costs. The usage of these assets is only partial: individuals drive to work and back for a few miles, then park their car overnight, unused. When they travel, urban congestion means that often cars stand idle with their engine running, emitting enormous quantities of CO₂, and contributing to climate change. This waste of resources makes the current system of living deeply unethical. As a consequence of all these considerations it can be suggested that the adoption of “value in use” as a central pillar of marketing is the most logical development towards a Sustainable Marketing paradigm.

The concept of Product Service System

PSS has acquired currency as a business model because it embodies the integration between goods and services which Vargo and Lusch (2004) advocate. PSS is defined as a “marketable set of products and services capable of jointly fulfilling a user need” (Goedkoop et al, 1999:18), or as a “System of products, services, supporting networks and infrastructure that is designed to be: competitive, satisfy customer needs and have a lower environmental impact than traditional business models” (Mont, 2001:239). It is also seen as an “innovation strategy, shifting the business focus from designing (and selling) physical products only, to designing (and selling) a system of products and services which are jointly capable of fulfilling specific client demands” (Manzini and Vezzoli, 2002:851). PSS allows continuous monitoring of customer satisfaction (Kimita et al, 2009) as customers participate to value creation in real time. PSS can be designed on the basis of a “blueprint” which can include the product and service elements, as well as the various stages of the life cycle of the PSS, including usage by customers and end of life (EOL) when product life can be extended (ibid.). In particular, EOL stages include recycling, remanufacturing, refurbishing and proper disposal (Lee et al, 2007). This is a special feature of a PSS: it can be designed to allow for value creation by the supplier along the whole life cycle.

Benefits of PSS

There are important benefits that help make the case for the adoption of PSS as a dominant business model. PSS facilitates take back schemes and systems, satisfying requirements such as that of EU Directives such as the *Waste Electrical and Electronic Equipment (WEEE)* (Mont, 2001; Lee et al, 2007); it supports education towards more environmental use, including product disposal behaviour (Lee et al, 2007); it encourages limitation of the use of resources to what is really needed, leading to dematerialization; it leads to improvements in product design (Manzini and Vezzoli, 2002), giving incentives to manufacturers to design more efficient products with longer life cycles (Mont, 2001) even for raw materials and packaging through reuse (Manzini and Vezzoli, 2002) and it discourages planned obsolescence (ibid.), while encouraging good maintenance, repair and recycling of resources; it facilitates the identification of market niches for said resources (Lee et al, 2007); it supports closed loop industrial systems; it could create new market opportunities (Mont, 2001), for example for financial services and asset management companies to lease machines (Lee et al, 2007); it encourages continued communication between supplier and customer, with consequent improvements of provision (Mont, 2001).

Information on all stages of PSS life cycle by means of web based resources enables actors to make sound usage decisions on products, and empowers customers (Lee et al, 2007). Specific benefits for suppliers include value added to their offering, including unique and distinguishing benefits (Mont, 2001;

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Manzini and Vezzoli, 2002); relationship enhancement (ibid.); more customization; market share protection (Mont, 2001), and it can be argued, customer retention. The adoption of PSS can improve a company's competitive position, including decommodification of their offerings (Kimita et al, 2009). Environmental benefits can also improve competitiveness (Porter and van der Linde, 1995; Maxwell and van der Vorst, 2002); it could create additional employment opportunities and offer new opportunities in mature industries (Mont, 2001). The opportunities to charge for the service components of the PSS would counterbalance the reduction of products sold (Manzini and Vezzoli, 2002) and possibly even increase profitability; it could enhance health and safety procedures (ibid.). Benefits for consumers include that they will only pay for the use they actually make of the product; in some cases PSS can make products more accessible, for example people could use cars who cannot afford them (ibid.).

From the point of view of stakeholders concerned with environmental issues and of policymakers, in respect to the shift towards a low carbon economy as advocated by (Stern 2006), PSS present a crucial benefit: they can be a faster way to market for sustainable solutions as opposed to radically new technological innovations (Manzini and Vezzoli, 2002), as they can be based on existing – and even mature – technologies. PSS create opportunities for environment protection as companies absorb externalities, and actualize a “polluter pay” principle enacted along the life cycle of the PSS including after the EOL stage.

Problems with PSS

There are some potential drawbacks to the adoption of PSS. The “rebound effect”, which is when consumers use too much of a product, or are careless in its use, since it does not belong to them (Manzini and Vezzoli, 2002), could nullify the environmental advantages. Multiple uses do not necessarily make a product more sustainable (Mont, 2001). The increased accessibility mentioned by Manzini and Vezzoli (2002) means that more people could be able to drive large cars. Air flight is an example of what happens when a PSS with environmental issues is affordable by everyone. Moreover, a PSS needs to be a special type of PSS to achieve environmental benefits, specifically designed to be sustainable and eco-efficient (Manzini and Vezzoli, 2002), and include environmental tools as an essential element of the product development life cycle (Lee et al, 2007).

Barriers to Adoption

Consumers might not be enthusiastic about ownerless consumption (Mont, 2001). The fact that customers are more interested in use than ownership of products inferred by Vargo and Lusch (2004) has not been adequately researched. Ownership of luxury products delivers more than functionality; it might include emotional attachment to an item and sense of pride and status. Full scale adoption of PSS requires high consumer involvement and education by marketers (Mont, 2001), and arguably policy interventions such as legislation and taxation (Mont and Lindqvist, 2003).

Business leaders and policy makers could perhaps be concerned about the impact of a shift towards a service based economy – and widespread adoption of PSS business models on the existing economic model; a reduction in manufacturing volumes for some products, for example cars, would herald a seismic structural shift in economies – even when acknowledging that some Western economies are already based for 70-80% on services (Lovelock and Wirtz, 2004). One of the consequences would be the reallocation of human resources, which might bring about job losses in manufacturing. Another possible problem is that of negative impacts on the Financial Services industry: if people no longer buy costly assets such as cars, they do not need finance. Other barriers include the difficulty of designing sustainable and eco-efficient PSS (Mont, 2001; Manzini and Vezzoli, 2002). This design requires the creation of new relationships and networks including various stakeholders in the value chain (Mont, 2001). The changes required in business processes, culture, management practices, and relative switching costs, might deter companies from adopting this model. Finally, companies might be hesitant – unless forced by legislation – in embracing end of life responsibility (Mont, 2001).

The lack of knowledge of the PSS concept by businesses, and the paucity of success stories, as well as lack of investment in the area, is a problem in persuading businesses and policy makers to support it (Mont, 2001; Mont and Lindhqvist, 2003). There is also not enough data to demonstrate the environmental effectiveness of PSS, or indeed whether PSS perform better than traditional product provision (Kimita et al, 2009). “There is currently little evidence that simple substitution of selling a service versus selling a product has created (...) solutions that are significantly more sustainable” (Evans et al, 2007:4227) and a general dearth of successful examples and case studies (Mont, 2001).

This paper suggests, however, that although this adoption needs further investigation, it deserves advocacy, because of the radical, discontinuous change required in our industrial system advocated by Stern (2006). In spite of the limitations mentioned, there seem to be some successful examples of PSS implementation. Figure 1 summarizes some of those cited in the literature.

Table 1 - Successful examples of best practice of PSS

Company (ies)	Description	Benefit	Source
Mobility Car Share (Switzerland), Streetcar (www.streetcar.co.uk/) (UK) City Car Club (www.citycarclub.co.uk/) (UK)	Drivers accede to cars using a smart card. The card allows them to pay for fuel. Payment if by use No ownership of product	Reduction of congestion; less cars are needed; vehicles are kept technologically updated and in good running order	Belz and Peattie (2009)
Diddi & Gori Textile Flooring service (Italy)	Digodream is flooring made of fabrics that the company leased to companies taking part to during trade fairs and exhibitions. It is sold as an entire service, including supply, installation and removal.	Client only pays for product use; easily recyclable by design; promotes longer supplier / client relationship, new market niches and enhanced brand loyalty; profitable extension of life cycle of the fabric; saving of raw materials	Manzini and Vezzoli, (2002)
Klüber lubricants (Italy)	A mobile chemical laboratory (a van) verifies directly on industrial machines the performance of lubricants and their environmental impact	Clients are free from the task of monitoring the lubricant performance (with cost savings); reduction of quantity of lubricant used with consequent prevention of pollution; health and safety benefits	Manzini and Vezzoli, (2002)
Allegrini Detergent Service (Italy)	Home delivery of detergents by van. Households select the quantity of the product they need; packaging (flacons) is reused	Phosphorus free containing vegetable, renewable surfactants; reduction of packaging materials and costs; fuel and pollution reduction	Manzini and Vezzoli (2002)
The AMG solar heat selling service (Italy)	“Solar heat service”. Innovative equipment combines heating generated by methane with that generated by solar power	Customer only pays for unit of “heat” supplied; payment by “unit of service” and not by unit of consumed resources.	Manzini and Vezzoli, (2002)

Source: The Author

A crucial challenge businesses face in designing models of provision based on PSS is the fact that these are built and operated by *networks of companies*, rather than by single providers (Evans et al, 2007; Lee et al, 2007). This presents problems deriving from the difficulties of these companies to work as part of an integrated network. The inability to do this is one of the observed issues of operating a PSS (Evans et

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al, 2007). This puts the onus on companies to develop stable and trusting relationships between providers. Most producers need to develop new skills in networking with other actors (ibid.). There is also a requirement for sophisticated communication systems, which probably calls for the development of novel ICT technologies. There might even be a need for specially trained PSS designers. This paper subscribes to this view, and suggests that the identified limitations can be partly due to a lack of integration of networks and the immaturity of the market. The new skills Evans et al (2007) invoke can be found in the marketing “tool box”. The interaction approach can point at avenues for successful implementation of PSS.

Importance of interaction and relationships

The PSS business model requires a different approach to marketing. The reliance on sharing rather than ownership raises concerns about the availability of products at required times and places. This calls for a sophisticated level of resources and information management. For example, in the case of car sharing services, the providers in the network supporting the PSS include a car manufacturer; asset management companies (which may or may not be same as the manufacturer) to manage the car parc; various locally based car services facilities, to ensure cars can be kept in good working condition regardless of where they are based; fuelling stations, which need to be signed up to the scheme as drivers need to pay for fuel using the smart card which enables them to use the car; a company that operates the smart card and comprehensive database including cars and drivers, as well as usage information; a billing company; an insurance company to ensure the cars; the road system, and so on. This example shows that a number of networked providers are involved in the operation of such a system.

PSS is made of autonomous, distributed and heterogeneous partner organizations (Evans et al, 2007; Lee et al, 2007). In order to deliver such a provision, all the companies need to cooperate as a connected network (Evans et al, 2007). A high level of trust needs to exist between these suppliers, and between suppliers and customers. For example, they would need to reach agreement on a fair revenue share, as well as on responsibility towards the customer if the service fails. The role of interfacing the customer also needs to be allocated. Trust is the cornerstone of successful relationships (Selness, 1998). PSS in a nutshell require very good interaction and relationship management systems. Customers need to access information in real time when they are on the road. This opens opportunities to use mobile and web based ICT to assist the checking of availability and booking of a vehicle or other product. In this paper it is proposed that the design and operation of business models based on PSS should be based on the theory of interaction.

The interaction approach, introduced in the 80s, is an attempt to describe the way companies interact between each other when getting involved in business transactions and relationships (Håkansson, 1982; Ford and Håkansson, 2002; Ford and Håkansson, 2004). The interaction approach is very effective in modelling the complex relationships and interactions which are necessary to ensure that the whole network complies with environmentally sound practices. This involves skilful relationship and network management, and requires the fostering of high levels of commitment and trust by means of nurturing relationships (Selnes, 1998). These relationships involve not only suppliers and buyers (referred to as “dyads”), but also interconnected networks, where different providers in the network interact to create value. Trust is accepted to be an essential ingredient of these interconnected relationships. Organizations shape each other and change in a dynamic way in the course of their interaction, and go through a reciprocal learning process (Håkansson, 1982; Ryan et al, 2008). The interaction between actors involved in the operation of a PSS would generate continuous reciprocal learning, which would help providers improve the efficiency of the system, by identifying new ways of reducing waste and minimize environmental impacts. Policy makers and knowledge hubs, such as universities and research institutes could facilitate the direction of this learning towards the achievement of real environmental benefits (Catulli, 2009). In other words, a successful diffusion of environmentally effective PSS would greatly benefit from the support of innovation networks, defined as “the linkages between organizations (other companies, universities and regulatory agencies)” which support the creation, capture and integration of “the many different skills and knowledge needed to develop complex technologies and bring them into the market” (Calia et al, 2007:427).

When addressing the practicality of network management, ICT supported services, such as for example web based interactive systems, can enable users and customers to access services and interact with a network including design tools, information resources, technical advisers and service resources such as training, technical maintenance and repair (Lee et al, 2007). These web based resources can certainly coordinate the operation of networks of different departments and companies. The critical success factors of the PSS business model, especially when considering its objectives of environmental benefits, would therefore have to include a high level of expertise in relationship and network management. This management will need to be informed by environmental principles and supported by environmental tools, and therefore allow for the input of experts in environmental management. This is a radical change from “traditional” business models. The adoption of PSS needs support in particular by policy makers, for research, pilot projects, dissemination of information on successes, knowledge transfer, combination of all this information provision with policy instruments and identification of barriers to the involvement of investors (Mont, 2001). Policy instruments to encourage the adoption of PSS might include raised taxes on ownership of products (road tax), incentives to the adoption of PSS models, grants for research, and other (Mont and Lindhqvist, 2003).

Conclusions

This paper supports the view that PSS is a strong contender for the role of a radical innovation to bring about environmental improvements in the operation of the economy. These opportunities include the speed to market of these business models, which means that environmental targets might be achieved faster than with the introduction of new technologies, and require less investment. In spite of the attractiveness of PSS as an environmentally effective business model, much still needs to be done to make them generally viable. This paper has suggested that introducing strong relationship and network management practices and involving marketing professionals in the design and management of PSS could assist their successful implementation.

Recommendations

- Marketing practitioners should evaluate opportunities to modify their business activities so that they are based on value in use by maximizing the service content of their offering and minimising transfer of ownership. Marketers should participate to the design of PSS based on networks of providers and buyers bound by relationships based on trust and supported by adequate information and communication systems. This is a major opportunity for marketing professionals, who can dedicate themselves to the design of PSS blueprints adapted to specific products and markets;
- Marketing educators and scholars should support further evolution and adoption of PSS, and champion the adoption of these business models by future managers and entrepreneurs;
- Policymakers should give incentives to business and consumers to embrace PSS. Low carbon industrial strategies of countries such as the UK should not miss the opportunities represented by Product Service Systems. Policy makers should therefore stimulate the adoption of these business models by economic actors by designing policy instruments including certainly market based instruments such as subsidies and grants, as well as taxation of ownership, but also, if necessary, regulation.

Directions for research

From the above discussion it is evident that in spite of the high quality literature, there are some gaps in current knowledge of PSS, especially of strategies to support the networking skills of suppliers. There is also insufficient engagement with the model on the part of marketing academics and practitioners. Fi-

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nally, further research is needed in policies which could support their mainstream adoption. Proposed avenues for research are:

- Investigate the attitudes of consumers and business buyers towards the sharing or renting of a given product as opposed to acquiring ownership of it;
- Identify constraints perceived by business managers towards the shift towards a relational model based on value use rather than transfer of ownership;
- Map the implications of this shift for marketing, in particular identifying the adoption of marketing practice including knowledge creation and transfer, education and training and the identification of need for new marketing specialist expertise and technologies;
- Investigate ways marketers can deploy the interaction approach, networking and relationship management theories to inform the design and operation of PSS
- Suggest best practices to be adopted in the implementation of PSS so that environmental benefits deriving from them are maximized.

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