Customer satisfaction: review of literature and application to the product-service systems

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This feasibility study commissioned by the National Institute for Advanced Industrial Science and Technology in Japan (AIST) and supported by the Sustainable Consumption Unit (UNEP) provided an overview of approaches used in different disciplines for evaluating consumer behaviour.

The study analysed the applicability of existing research concepts, theories, and tools for evaluating consumer satisfaction with product-service systems (PSS). It included a discussion over their strengths/weaknesses. This paper presents a short overview of the study.

BACKGROUND

It has been recognised that eco-efficiency improvements at production and product design level can be significantly reduced or totally negated by rebound effect from increased consumption levels. In line with this problem factor 10 to 20 material and energy efficiency improvements have been suggested (Factor 10 Club 1994; Schmidt-Bleek 1996; Bolund, Johansson et al. 1998; Ryan 1998). The improvements, however, if not carefully done, may still lead to rebound effects through changes in resource prices.

As a potential solution to the factor 10/20 vision system level improvements have to be made, contrary redesigning individual products or processes (Weterings and Opschoor 1992; Vergragt and Jansen 1993; von Weizsäcker, Lovins et al. 1997; Ryan 1998; Manzini 1999; Brezet, Bijma et al. 2001; Ehrenfeld and Brezet 2001).

The product service system (PSS) concept has been suggested as a way to contribute to this system level improvement (Goedkoop, van Halen et al. 1999; Mont 2000). Here the environmental impacts of products and associated services should be addressed already at the product and service design stage. Special focus should be given on the use phase by providing alternative system solutions to owning products.

A number of examples in B2B area exist that confirm the potential of PSS for reducing life cycle environmental impact. It is, however, increasingly evident that business examples are difficult to directly apply to the private consumer market. Private consumers, contrary to businesses, prefer product ownership to service substitutes (Schrader 1996; Littig 1998). Even if accepted, the environmental impacts of “servicised products” offers depend to a large extent on consumer behaviour.

To address this problem, either behavioural or service system design changes are needed. Changing human behaviour and existing lifestyles contributes to the vision of sustainable development, but at the same it is extremely difficult and time-consuming process.
A potentially easier way is changing the design of product-service system to reduce behavioural pitfalls. In order to change system design, it is necessary to understand how consumer acceptance of more sustainable solutions is formed, influenced or changed, what are the influencing factors and what are the leverage points for best results with lowest costs. Understanding consumer perceptions and behaviour in this context is crucial.

**CONSUMER RESEARCH IN DIFFERENT DISCIPLINES**

A considerable body of literature in a range of different disciplines exists on consumption, consumer behaviour, and consumer decision-making process. Research in economics, business, marketing, psychology and sociology domains studies consumer behaviour from different theoretical premises: “for economists, consumption is used to produce utility; for sociologists, it is a means of stratification; for anthropologists – a matter of ritual and symbol; for psychologists – the means to satisfy or express physiological and emotional needs; and for business, it is a way of making money” (Fine 1997).

For more than a decade now, a range of studies that address environmentally sound consumer behaviour, e.g. car use, waste sorting, minimisation and recycling practices, have been conducted. However, few studies evaluated consumer acceptance of the PSS concept – a consumption based on non-ownership of physical products, see, for example, studies on car sharing schemes (Schrader 1999; Meijkamp 2000), ski rental and washing services (Hirschl, Konrad et al. 2001).

One reason explaining the lack of studies in the area could be that, there are still not many PSS schemes in place to serve as test grounds. Another reason could be uniformity of research focus. Most of consumer research focused on adopter categories, habits, attitudes and intentions, rather than on actually measuring the satisfaction level with the service. The reason is probably that PSS ideas have been promoted by researchers from the environmental management, marketing, design and engineering fields, and to a lesser extent by sociologists, who hold the banner of research in customer satisfaction.

**CONSUMER SATISFACTION PROCESS**

The paramount goal of marketing is to understand the consumer and to influence buying behaviour. One of the main perspectives of the consumer behaviour research analyses buying behaviour from the so-called “information processing perspective” (Holbrook and Hirschman 1982). According to the model, customer decision-making process comprises a need-satisfying behaviour and a wide range of motivating and influencing factors. The process can be depicted in the following steps (Engel, Blackwell et al. 1995):

- **Need recognition** – realisation of the difference between desired situation and the current situation that serves as a trigger for the entire consumption process.
- **Search for information** - search for data relevant for the purchasing decision, both from internal sources (one's memory) and/or external sources.
- **Pre-purchase alternative evaluation** - assessment of available choices that can fulfil the realised need by evaluating benefits they may deliver and reduction of the number of options to the one (or several) preferred.
- **Purchase** - acquisition of the chosen option of product or service.
• Consumption - utilisation of the procured option.
• Post-purchase alternative re-evaluation - assessment of whether or not and to what degree the consumption of the alternative produced satisfaction.
• Divestment - disposal of the unconsumed product or its remnants.

Besides the information processing perspective, marketing analyses consumer behaviour by employing a psychologically grounded concept of attitudes (Balderjahn 1988; Ronis, Yates et al. 1989; Luzar and Cosse 1998). It is consumer attitudes that are usually named as the major factor in shaping consumer behaviour and a wealth of studies is available on the topic of how attitudes can predict behaviour.

**INTER-DISCIPLINARITY OF CONSUMER RESEARCH**

Different research disciplines diverge in their presuppositions about the human nature, factors influencing consumer behaviour, market response, etc. Therefore, they naturally employ different research approaches. However, despite that seemingly insurmountable abyss between disciplines, we see that many research topics and methods overlap, and that there is no clear-cut line between different domains of consumer research. Many consumption-related issues are being increasingly addressed from interdisciplinary or multidisciplinary perspectives.

Many interdisciplinary concepts and factors are of interest for research on consumer satisfaction with eco-efficient services and PSS. Contrary to the suggestions from many traditional neoclassical theories, consumption patterns are much more flexible and prone to various influences. Today consumer behaviour is increasingly dynamic as the choice of alternatives increases with the growth of global markets. The complexity of the decision-making process and a large number of influencing factors suggest that changing consumer behaviour towards more sustainable consumption is a challenging process, which requires coordination at individual and societal level.

The area of PSS and eco-efficient services is still developing. Further efforts are required in order to understand relations between functional and emotional needs of customers.

**DIFFERENT LEVELS OF COMPLEXITY**

When evaluating satisfaction with a product, customers initially assess tangible features of the product. In the service context, the features, though observable, are considerably less tangible and are thus more difficult to assess. A product service system comprises four components (products, services, infrastructures, and networks, see Figure 1), rendering the evaluation process of consumer satisfaction even more complex. Here the part of the system, with which customer comes into direct contact, is larger than in the case of a pure product or service, which has implications for customer evaluation process. In the case of PSS or eco-services, customers are exposed to both dimensions: product and service. In addition, due to closer relations with the service provider customers can even become exposed to infrastructure and networks that support PSS delivery. Therefore, in the PSS context, an evaluation of all four PSS components becomes relevant:

• Product evaluation is conducted by assessment of products or technologies.
• Person-based or other types of services (technical, information and knowledge services) that are included into PSS may be evaluated.
Life cycle approaches to sustainable consumption, AIST

- **Infrastructure** can be evaluated when the customer comes into contact with enabling supporting technology, or by evaluation of ambient conditions, spatial layout or by evaluating signs and artefacts of the PSS.

- **Networks**, usually are not exposed to the eyes of the customer, but in some cases may be evaluated when they come into contact with the customers.

![Figure 1 PSS dimensions that can be exposed to customer judgement](image)

**RESEARCH FRAMEWORKS AND METHODS**

A great variety of methods and frameworks for understanding and evaluating consumer acceptance and satisfaction are used in different disciplines. The study has discussed the following frameworks: Kano model of customer satisfaction, the Innovation diffusion of Rogers, the service quality model of Grönsroos, and SERVQUAL model by Parasuraman.

The study has also surveyed a range of tools used for evaluating and measuring consumer satisfaction. These included surveys, in-depth interviews, focus group interviews, observations, mystery shopping, and psychographic portrait of customers. A number of drawbacks and benefits pertaining to the tools have been pointed out and discussed. Both the research models and the tools, while diverse to different extent, were found to be useful for application in the PSS research area.

**CONCLUSIONS**

The environmental impacts of ever increasing consumption throughout the world have been recently recognised. Many solutions have been proposed to combat the raising levels of consumption. One of the concepts suggested as a potential solution to reduce consumption levels is the concept of product-service systems (PSS).

The concept proved to be viable in the business-to-business context. However, in the private consumer markets, it has been less successful, both in terms of economic viability and environmental impact reduction. User behaviour has been named as the primary reason for this situation.

To address this problem, either behavioural or service system design changes are needed. Changing human behaviour and existing lifestyles contributes to the vision of sustainable development, but it proves to be an insurmountable task over a short period of time.

Contrary, changing the design of product-service system to reduce the behavioural pitfalls could a potentially easier way towards sustainable development. Changing system design requires understanding how consumer acceptance of more sustainable
solutions is formed, influenced or changed, what are the influencing factors and what are the leverage points for best results with lowest costs. Understanding consumer perceptions and behaviour in this context is crucial.

However, the consumer decision-making process is much more complex and intricate than just a simple decision about shifting from owning a product towards paying per use of it. Throughout this study we demonstrated that products are not seen purely for their functional features, but rather products are complex combinations of various attributes, which, together with functionality, also bring status, serve as a key to a certain social class, reinforce once self-esteem, and much-much more.

Therefore, the goal of this study make a step towards a better understanding the complexity of the phenomena we set to change. We did that by looking at how different disciplines perceive the consumption process in general and consumer decision-making process in particular. We saw the wealth of theories and frameworks being developed trying to solve this puzzle. We then looked closer at potentially most promising models, which could prove useful understanding the consumer decision-making process in the context of ownerless consumption.

We also found some useful tools, which can be employed for collecting information about and from consumers. Identified frameworks and tools are then being evaluated for suitability in the PSS context. We also provided some suggestions and examples for how several presented models could be operationalised in the PSS context.

Some important lessons were learned from this study:

- Consumer is a moody creature – swinging between rationality and emotions.
- All disciplines we looked at address consumption from some perspective. This perspective may be unique to this discipline, or may share common premises with one another. Cross-fertilisation and learning is the key to success.
- The challenge is not in the availability of analysis tools, but in analysis frameworks, which would allow us to speak the same language as our system and understand it better.
- We can probably employ just one tool to measure customer satisfaction with our system. But it is multifaceted and thus a combination of tools is more promising.
- PSS is a system, comprised of products, services, infrastructures, and networks. The criteria we want to evaluate this system against should include attributes of each dimension.
- PSS is a multi-disciplinary area and initiating system level change will require system level effort. Researchers with various backgrounds need to be involved in developing ideas and methods for measuring customer satisfaction with PSS. “Non-social” PSS practitioners should learn methods of social sciences.

**REFERENCES**


