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Tan, Adrian Ronald; Evans, Stephen; McAloone, Tim C.

Published in:
Proceedings of Joint Actions on Climate Change

Publication date:
2009

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Tan, A., Evans, S., & McAloone, T. C. (2009). Succeeding in Business by Managing Consumption: A more sustainable approach to selling for. In R. D. Andersen, & M. Lehmann (Eds.), Proceedings of Joint Actions on Climate Change Aalborg: Aalborg University.

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Succeeding in Business by Managing Consumption - a more sustainable approach to selling for manufacturers

Adrian R. Tan¹, Steve Evans² & Tim C. McAloone¹

¹ *Department of Management Engineering, Technical University of Denmark*

² *Department of Manufacturing, Cranfield University*

Abstract The efficiencies of mass production of our industrial system have paved the way to our current paradigm of mass consumerism. Although this has spurred global economic wealth and improved the lives of billions of people, we realise today this is not a sustainable way of fulfilling customer needs and demands. Many manufacturing companies are doing what they can on the supply side and creating more environmentally superior products, but if industrial systems are to become sustainable they also need to directly address issues of consumption. This paper provides three case studies of manufacturing companies that demonstrate that business can be successful by selling fewer products. The business model of each of the companies actively attempts to reduce their customers' consumption through service delivery while increasing customer satisfaction. This has proven to reduce customers' costs, increase long term relationships to customers and radically reduce environmental effects.

Keywords Sustainable Consumption and Production, Product/Service-Systems (PSS)

1 Introduction

The dominant paradigm of industrial systems over the past century has been mass production. This has allowed products to be designed and manufactured in great quantities at low costs, faster to market and of better quality than ever before. The efficiencies of mass production have paved the way to mass consumerism that in turn has spurred global economic wealth, improving the lives of billions of people. Today, however, it is apparent that the effects of the current industrial systems on our natural environment and consequently our own well-being are unsustainable.

Manufacturing firms have traditionally succeeded in business by selling as much as they could produce. Designers have constantly created new products, factories produced them as fast and cheap as possible and marketing encouraged demand – all contributing to ever increasing levels of natural resource consumption. It has been of little concern, what happens to products once they are sold and

handed over to the customer. This situation is now rapidly changing, with industry creating environmentally superior products in environmentally superior factories, using environmental supply chains. However, if industrial systems are to become sustainable they also need to directly address issues of consumption. The role of design, manufacturing and service delivery may no longer be to sell *'more stuff'*, but to address how people's needs can be sufficiently fulfilled in a manner which is economically and environmentally sensible – *'selling less stuff'*.

This paper provides case studies of three manufacturing companies, which demonstrate that business can be successful by selling less stuff, using service-oriented approaches. The business model of each of the companies actively attempts to reduce their customers' consumption while increasing customer value and satisfaction. Each case describes the company, its business and their value propositions.

2 Methodology

This paper describes how the three following companies succeed in business by actively contributing to the reduction of their individual customers' consumption of products:

- **Steelcase** is a large global manufacturer of office furniture. Founded in 1912 in Grand Rapids, Michigan its first products were filing cabinets and safes. In 2008 the company employed over 13,000 people worldwide and today it offers a wide range of office furniture and related products and services (Steelcase 2008). This paper focuses on the company's corporate consulting team that assists clients to develop workspace strategies when planning their physical work environments.
- **Vitsoe** is a small company based in London, England that manufactures and distributes high quality designer furniture. The company's main product is a universal shelving system originally designed by the renowned designer, Dieter Rams, in 1960. Vitsoe employs around 40 people, including planners, who work with customers and installers, who install their shelves on their customers' site (Adams 2008).
- **SCA** is a Swedish manufacturer of pulp and paper-based personal care products, tissue, packaging, publication papers and solid wood products. Originally established in 1929, the company now operates in more than 90 countries and in 2008 it had approximately 52,000 employees (SCA 2009). This paper focuses on the Incontinence Care division of the Danish subsidiary, SCA Hygiene Products A/S. In Denmark the majority of SCA's incontinence products are sold directly to health care institutions and nursing homes through public tender contracts.

The insight into the companies and their operations derive from a PhD project on Product/Service-System (PSS) development for manufacturing firms (Tan forth-

coming). Case study research was chosen here as the research method as it gives deep insight to the research object and its context, whilst still allowing analysis of many variable factors (Yin 1994). As the objective is to gain insight into each company's practice and context, the case studies are qualitative and explorative.

The information for Steelcase and Vitsø was gathered by one of the authors as a participant observer in new service development projects with the companies covering 15 months and 4 months, respectively. The case on SCA was mainly established through interviews of 8 key employees and 5 employees in a customer's organisation as well as observations from company meetings and workshops. In all three cases multiple sources of information were used and findings were presented and discussed with the companies. To structure the description of each case study a framework for the conceptualisation of PSS's was applied, to elucidate four essential perspectives (Tan et al. forthcoming):

- **Value perceptions** - Multiple perceptions of a product or service's value co-exist depending on stakeholder and context. The objective is to identify and understand what benefit(s) or value is the product or service attempting to propose and deliver. What are the competitive parameters on the market and what do each of the stakeholders and customers actually want? On a basic utilitarian point of view, the LCA term 'functional unit' can be used to describe the benefit(s) or value attributed to a product or service. This reference point describes the quantified performance expectation of the product over a given usage period and frequency but is not sufficient on its own to grasp the prolificacy of the social and cultural significance of products and services. In order to understand how multiple perceptions of a product or service's value co-exist depending on stakeholder and context, a socio-technical perspective must be introduced. By using concepts as 'interpretative flexibility' from the theory of Social Construction of Technology (SCOT) (Bijker 1997) designers can adopt a more relational perspective in order to describe aspects that are not inherent to the product or service as history, status, prestige and identity.
- **Product and product life** - In sustainable product development, it is essential to first design the total product life cycle, and then design the products appropriately to be embedded in the life cycle (Kimura & Suzuki 1996). The product life cycle and environmental profile needs, however, to be understood first. Starting with an analysis of its physical components and materials, the history and possible future life scenarios of the product are determined. By investigating the product's total life cycle, stakeholders, activities and life cycle systems (all traditionally not considered in product development) new opportunities are uncovered. Here the influences of each can be studied and the relationship between product and life phase be understood.
- **Customer and customer activities** - A product's environmental effects are largely determined by how it is handled by the people interacting with it. Inspired by Vandermerwe's (2000) Customer Activity Cycle methodology the key stakeholders' needs are identified and the sequences of activities that occur before, during and after interacting with the product or service are modelled. This mirrors the analysis of the product life cycle and opposes the

product and production oriented perspective with a service and consumption oriented perspective. This perspective's main virtue is the way it prompts the designer to make a consideration of the sequence of activities of the stakeholders, hereby contributing to the knowledge of the designed offering's use phase. Here too, stakeholders and activities otherwise not considered are uncovered. These represent potential for companies to influence or support the customer (or stakeholder) activities more effectively, as well as to build stronger relationships.

- **Actor network** - For a system to be sustainable (in economic, social and environmental terms) the relationships between all the stakeholders must be collectively beneficial. Through a mapping of active stakeholders as actors in a network around the product or service the flows of value, material, energy, information, service and transport are identified and contribute to a description of key issues in the network. Actor Network Theory (Latour 1991) assists with considerations on how new product and services may be adopted and form an integral part of the socio-technical system. The actor network analysis brings attention to how shared understandings in the network produce implicit and entities normally taken for granted, but also how new tensions may evolve from the displacement processes that follow when the design objective is transformed from product performance to service system. An approach of visualising the actor network is here similar to Customer Value Chain Analysis (Donaldson et al. 2006), which allows design teams to identify pertinent stakeholders and their relationships to the product or process being designed, but takes a broader view of the supply chain to include the multitude of the consumption and social system.

With only three case studies the findings do not represent a general validated answer to how companies may approach sustainable consumption and production, but they do provide interesting insight and inspiration to how such new, more sustainable, business models may be developed.

3 Case studies

3.1 *Steelcase*

Steelcase is a global leader in office furniture (<http://www.steelcase.com>). Its mission is “*to provide a better work experience*” which they try to accomplish by offering a multitude of products and services that surround the office workplace environment (Steelcase 2008). The company believes that the physical office workspace environment is a strategic asset (on the same level that people, technology and business processes are) that can leverage their client's strategies and help them achieve their business goals. The office work environment has changed drastically in the past few decades. Work is increasingly information and knowledge intensive, traditional organisational hierarchies have given way to flat, de-

centralised structures where work is based on projects, teams and networks, and the emergence of information and mobile communication technologies has drastically changed the way people may communicate with each other. This has resulted in 'work' no longer being confined to a particular time or place, but can be performed at any time, any where. People today can work from other locations, such as their homes, and flexible working hours allow employees to decide when they want to work. In addition globalisation has increased the rate that companies establish and relocate their offices.

Steelcase operates mainly on the business-to-business and business-to-government (public sector) market and has a strong global presence supported by independent and company owned dealers throughout the world. The company is usually associated with high quality durable products that take environmental issues seriously. Steelcase has a large existing customer base and estimates that their furniture represents the largest installed based in the industry (Steelcase 2008). Steelcase positions itself as a company that understands and is knowledgeable about the way people work in offices as well as the social aspects of the activities associated with work. With the acquisition of IDEO, the renowned design consultancy in 1996, Steelcase has developed user-centred design to be one of its key strategic competencies.

Building upon their understanding of social behaviour in the workspace and user-centred design methods, Steelcase has a dedicated team of (approx. 20) high level corporate consultants called Applied Research Consulting (ARC) that assists clients to develop a workspace strategy that supports their organisation's objectives. This typically happens when their clients need to change their current workspace either because of a move to a new location, an internal re-organisation or the building of a new office. Their clients' motivations for changing their workspace could be anything from cost savings (i.e. moving to a smaller office) or revitalisation of the company culture. Whatever the case, the ARC consultants work with their clients and their employees to optimise their workspace so it best supports them. This may even mean introducing work areas that are not assigned to individuals but are shared and thus reduce the need for office space without affecting employee satisfaction and productivity, but actually enhancing it. One project with the Boeing company managed to reduce space with as much as 40% and increase productivity with 50% (Steelcase). The ARC consultants work and are paid fees independently of the furniture sales (e.g. sometimes their solutions involve reusing existing furniture that is not even their own brand), but a majority of customers tend to also choose Steelcase as their furniture provider if the consultants have been involved early in the process.

3.1.1 Value perception

The office furniture market competes mainly on product design, quality and durability, price, on-time delivery, and service and technical support, but with many competitors delivering comparable designs, quality levels and product features, the market is very price sensitive (Besch 2005). Companies typically view office

furniture and the physical work environment as necessities that represent costs, which at best only contribute marginally to their business performance. Office furniture is seen as something companies must have, but not an investment that pays back over time. The effects of the physical workspace environment on employees' work performance are usually not valued. Steelcase argues that in office workspaces employee salaries are by far the greatest cost to companies and the physical workspace is just a tenth of the total costs (Harrison et al. 2003), but the potential of the physical workspace to better support work can affect employee's daily productivity considerably and thereby also the organisation's total business performance. Steelcase usually sells to facility managers and purchasers in companies. These employees are typically measured in their own organisation on how good they are at minimising costs while maintaining the same quality level. Therefore Steelcase wants to draw the attention of the strategic aspects of the physical workspace to the business leaders in their client's organisation. Business leaders and senior managers have the total view of the organisation and understand that savings and investments should be done in the area with greatest potential and that these can have effects on the rest of the organisation.

Depending on how early in the process the ARC team is engaged in projects with clients and who in the organisation they interact with they are able to position their value proposition differently. If they are involved late in the space planning process where most decisions about the space are already made, then the potential for adapting the workspace to best suit the employees is limited. But if involved from the very beginning of a new building, then the ARC consultants can influence the architects by ensuring the building is designed 'from the inside out' and considerable saving potentials can be made. Less space means less furniture, but also less building materials and less energy needed to heat, cool and illuminate the building.



Fig. 1 Steelcase sells complete office furniture systems (i.e. chairs, desks, panels, storage, etc.).

3.1.2 Product and product life

Steelcase offers a whole range of products for the office, educational and health-care work environments, e.g. chairs, tables, workstations, cabinets, etc. (see Fig. 1) These products are manufactured in 30 factories around the world and are typi-

cally characterised by being long lasting products that require little maintenance. The greatest environmental impacts occur in the raw material extraction and production phases of the product life cycle. Office furniture is often disposed of long before its actual functional life is over. Steelcase has therefore already systematically implemented Ecodesign (i.e. Design for Environment methodologies) that ensure that their products are easy to repair and refurbish, and components are recyclable and non-toxic. Furthermore they offer services that manage and maintain furniture as well as offer local take-back systems that allow furniture to be resold.

3.1.3 Customer and customer activities

Manufacturing and the sale of physical products still constitute the majority of the company's activities, but Steelcase does provide a variety of service offerings that support the full cycle of activities their customers engage in relating to the workspace.

1. **Explore** – identifying space needs, programming of construction projects with architects and designers, etc.
2. **Plan** - planning and design of new workspace to best support employees and organisation's objectives, co-design with employees, etc.
3. **Provide** – leasing options, delivery, installation, orientation and ergonomic training, etc.
4. **Manage** – move management, reconfiguration of workspaces, additions, refurbishing, repairs and maintenance, disposal, etc.
5. **Measure** – workspace satisfaction surveys, post occupancy evaluation, etc.

In this way Steelcase can continuously assist their customers that they are making most use of the space and furniture that they have.

3.1.4 Actor network

Steelcase regularly partners with other companies and organisations. These could be together with:

- **architect and design firms** to design and plan new office buildings and work places for clients.
- **other office equipment manufacturers** (e.g. Canon (imaging equipment and information systems) and Armstrong (floors, ceiling and cabinets)) to do technology research or develop and provide new combinations of products.
- **universities and research institutions** to do research in how to help people work more effectively.

These partnerships allow both parties to benefit from each others competencies and also help gain access to customers. It is interesting that Steelcase can have multiple roles with their partners, some times they are just product suppliers or service providers, some times equal strategic partners and some times even in competition with them on certain aspects.

3.2 Vitsæ

Based on Dieter Rams' "*Ten commandments of good design*" Vitsæ has strong core values on how they conduct business. They aim to provide their customers with better living, "*with less, than lasts longer.*" Although a company based on product sales, Vitsæ has a very strong service orientation and committed to long term relationships with their customers rather than increasing individual product sales (Vitsæ 2008). Vitsæ sells mainly to private customers but also caters to the business-to-business market. Their customers are typically design and/or service centric. Most of the revenue is based in the UK (30% of turnover is exported).

3.2.1 Value perception

Vitsæ has a clear business strategy of offering a service and not a product (although they are convinced that they provide very high quality products). Yet their profits are generated on the sale of products - not on the extensive services also provided. In many cases the cost of services are included in the sale of products or if charged separately they are priced so they only cover costs. This service oriented strategy is however successful as half of their business is from existing customers which considering the durability and long life is very high. Profit is considered the result of life long relationships and the company attempts to constantly rekindle this relationship.

The market for design furniture is characterised by low technology developments, a strong focus on individual designers, aesthetics, creative forms and use of materials. Functionality is a given whilst it is rather expression and changing trends that dictate the market. Large discounts for products bought in large quantities are common in the furniture industry, but this is discouraged in Vitsæ as employees do not earn commission based on product sales. This only leads sales to be based on quantity and not on customer needs (Adams 2008). Customers should never feel they should buy more than they need and can always add to their products at a later stage without feeling they could have saved by buying more from the beginning. Vitsæ's products enjoy an iconic status on the market and retain their value well and are even prized on the second hand market.



Fig. 2 A configuration of Vitsæ's 606 Universal Shelving System.

3.2.2 Product and product life

Vitsø's product ranges comprise a shelving system (designed in 1960) and a chair programme (designed in 1962) both designed by the influential industrial designer, Dieter Rams. The 606 Universal Shelving System (the main product – see Fig. 2) is a total configurable system which remains largely unchanged since it was first launched in the early 1960s. The system and all its parts were designed with longevity in mind and are easy to construct, repair and dismantle allowing the system to be extended, rearranged and moved. All new components are compatible with the original system. Most of the product is made out of recyclable aluminium, steel and wood, and all joints are mechanical (i.e. not bonded or welded) allowing easy repair and dismantling.

Furthermore a logic of total life thinking is practised throughout the organisation where short-term gains should not compromise long-term expenses. Vitsø is strongly engaged in the whole life cycle of their products and the company works with its suppliers to ensure waste and packaging is minimised from supplier to customer (Vitsø 2008). Some examples of how Vitsø has redesigned and developed the product life systems surrounding their products are:

- Wooden stillages were specifically made to handle high value aluminium parts and together with cardboard packaging they are kept in a closed loop, returning to suppliers in the otherwise empty trucks to be reused.
- Installers transport the wooden cabinets in specially designed tautliner canvas bags instead of cardboard and are constantly reused (see Fig. 3). All cardboard packaging is also returned and if possible reused so that no waste is left at the customer's site.
- Installation tools (incl. a dedicated spirit level) are provided in a cotton bag to the customers that wish to install the shelving systems themselves. Vitsø registers which customers have already received the tools, so that they do not resend the same tools to customers that already have them.



Fig. 3 To transport its wooden cabinets (left) Vitsø uses specially designed tautlin bags (middle) which it reuses (right) saving on packaging and reducing environmental impact.

3.2.3 Customer and customer activities

A web-based product life cycle information system manages the complete process from initial customer inquiries, orders, logistics, production jobs, installation, accounts, and follow up. The system also registers details of customer interactions and photos of the customer's site to help planners and installers serve the customer effectively. Even though there often is a long period between each customers'

purchase of new shelves the excellence of their services are remembered many years after. This is furthermore enforced when Vitsø prizes itself on 'remembering' its customers and keeping track of exactly what was delivered and how it was installed.

3.2.4 Actor network

Key to Vitsø's success with services is that the company ensures that the whole process from planning, purchase, manufacturing to installation is taken care of and aimed to give its customers the best experience. Vitsø does sometimes work with interior designers and architects on projects, but tends to prefer establishing a direct contact with the end customer to best support long term relationships. As Vitsø's products do not change over time and customers are asked to buy less as they will always be able to add to it, both customer and company are committed to each other for the long term. Instead of aggressive advertising Vitsø prefers that their existing customers' satisfaction (if not enthusiasm) are conveyed to others through online comments of its products and services.

3.3 SCA

This case study is about the Incontinence Care division of the Danish subsidiary, SCA Hygiene Products A/S and one of their customers Lyngby-Taarbæk Kommune (a large municipality just north of Copenhagen). With their services SCA Hygiene Products A/S attempts to ensure that their products are used optimally, so that care institutions (e.g. nursing homes) can achieve time and money savings, better work conditions for their care providing employees and well-being for those with incontinence. SCA Hygiene Products A/S is based in Allerød (25km north of Copenhagen) with about 100 employees. In Denmark the majority of incontinence products are sold directly to public sector institutions, i.e. municipalities and hospitals, as the Danish public health care system provides incontinence supplies to anyone that is diagnosed with chronic incontinence. A small amount of products are however also sold directly to consumers through retailers.

Incontinence (bladder/bowel weakness) is a common condition that affects 5 – 7% of the world's population (SCA 2008a). In Denmark alone approx. 400,000 people live with incontinence daily. Incontinence can affect everybody but the prevalence increases with age. Between 70 to 80% of all residents in nursing homes are incontinent (Brodersen 2003). In spite of the great prevalence incontinence is generally tabooed which means that few people seek help on the problem even though it can be cured or at least relieved with incontinence products. The market for incontinence products is expected to grow with ageing populations. Globally SCA has been far the largest market share of incontinence products (26%) (SCA 2008a). In Denmark SCA controls approximately half of the market with only one other major player actively present.

According to EU legislation the purchase of goods and services in the public sector over a certain amount are subject to the rules of public procurement and open for bids every four years. This means that most of the incontinence

products in Denmark are sold through public tender contracts. The tender process is managed by public procurement officers and the director of elder care in the municipality. The tender is made public and suppliers are invited to give offers.

3.3.1 Value perception

SCA is currently leading the incontinence product market, where its strengths are customer and consumer (end-user) insights and local presence. Their products may not be the cheapest on the market, but due to their high quality, they are cost effective when taking the total costs of incontinence care into consideration. Fewer pads and fewer changes are needed with SCA's products. Therefore SCA takes a holistic view on incontinence care and provides services which consider the well-being of the individual person with incontinence, the work conditions for the care giving personnel and the total costs of incontinence care in the municipality. Incontinence products account for only about 1% of the costs in a nursing home, but studies have shown that when the time used on incontinence care is included this amounts to 13% of the operating costs (Brodersen 2003). If an incontinence product is less prone to leakage and faster to change, then the time saved by care providers already outweighs the cost of the product.

Previously only tenders for incontinence products were described in the tender documents but today training and other services that support incontinence care are specified. It varies, however, how the municipalities describe their tender, as integrated product and service bundles, or with products separated from services. Through the restructuring and merging of municipalities in Denmark the procurement functions have become more centralised and professional, and the tender contracts have also increased in size. Typically a user group consisting of continence nurses are associated to the tender process to assist in the specification of the quality of the bid and how different criteria should be weighted. The public procurement process puts forth a great demand on all suppliers to be able to document the added value of their products and services.

3.3.2 Product and product life

SCA's range of incontinence products covers disposable pads, protective underwear, fixture pants, underpads, wash cloths and wash creams (see Fig. 4). All the products are designed with particularly user comfort, ergonomics and leakage protection in mind. Environmental concerns are also prioritised highly, but rather than only consider the individual pad, SCA believes in providing the best functionality and thereby reducing the overall consumption of pads per user. SCA owns and manages large forest areas and plants many more new trees than they cut down. This means that their forests absorb about the same amount of carbon dioxide as the total emissions to the atmosphere from all of their production facilities (SCA 2008b). SCA's pads consist of an absorbent core, which is a mix of fluff pulp (cellulose fibres made from wood) and super absorbent polymer (SAP); a permeable non-woven layer; and a polyethylene film which acts as a breathable barrier layer. During the life cycle of a pad the greatest environmental effects occur during the extraction of raw materials and production, mainly from the production of

oil, polymer and pulp, but if the pad leaks, this induces washing of clothes and bed sheets, which severely adds to the inconvenience, costs and environmental impacts.



Fig. 4 Some of SCA's incontinence care products including pads, fixture pants, underpads, wash cloths and wash creams.

3.3.3 Customer and customer activities

To ensure that the consumption of pads is minimised, SCA offers a full range of services that aim to help nursing institutions and care providers reduce the need for pad changes and minimise the consumption of pads per person with incontinence. SCA's services are structured around the activities of the municipal employees involved in providing incontinence care:

1. **Plan** – An assessment of the current need and potential for improvement for incontinence care in the municipality and its care providing institutions. Objectives are formulated and an action and implementation plan on how these can be achieved.
2. **Coach** – Education courses, training and support of care giving staff to ensure that the incontinence products are used correctly and optimally. An individual ordering and distribution system is set up which allows SCA to track the consumption of each individual user with incontinence. Access to specially trained incontinence care nurses and the facilitation of a network to develop incontinence care competencies.
3. **Monitor** – Regular visits are made at each nursing institution to follow-up on the achievement of objectives and management of consumption together with consulting and guidance on how to continuously improve on the performance of costs and care.

Through their years of experience in incontinence care, statistics on the demographics of citizens and an analysis of data of incontinence pad consumption in several municipalities, SCA is able to set benchmarks, provide an idea of saving potentials and share best practices amongst their customers. Studies done in several large municipalities in Denmark show that pad consumption can be reduced with 20% with less leakages and much greater satisfaction amongst pad users and care providers (Scheel 2009).

3.3.4 Actor network

The public sector in Denmark faces great challenges today with an increasing number of elderly requiring care. Nursing institutions are experiencing increasing costs and decreasing resources per resident as well as difficulties to find, train and retain skilled staff. Incontinence care is not just limited to the use of pads and suppliers, but includes a complex organisation of individuals with incontinence, doctors, continence nurses, care giving personnel, nursing home managers, procurement officers, municipality officials, family members, etc. All of these actors play a role in ensuring optimal care, which makes the management of incontinence care an intricate task. SCA attempts to reach out and support all levels of incontinence care and therefore has to deal with multiple actors which each represent the ‘customer.’

4 Discussion of case studies

The three case studies presented here in this paper are all examples of how manufacturing companies are being competitive doing business by ‘selling less stuff’. Common in all the cases is that the products have the same environmental impact profile – they all have the greatest environmental impacts in the raw material and production phases. This means that the most effective ways to minimise environmental impacts are by reducing the consumption of new products, prolonging their use and enhancing their utility. All three companies are actively supporting their customers to do this without comprising their customer’s value perception, but actually enhancing it.

Although all the companies have strong environmental credentials, sustainability issues alone are not the main driver to managing customers’ consumption. The main reason is simply because it makes good business sense. This could be due to the nature of their products – they are all high quality and not the lowest cost choice if only considering their purchase price. Nonetheless all the companies actively engage with their customers and support their activities with services and are thereby able to demonstrate that when considering the total costs of purchasing and using the product their value propositions are cost effective on the long term. If they did not do this, they would not be able to retain the customers, as these would in the end choose lower cost alternatives. The documenting and benchmarking of the total costs (and total savings) are therefore important for these companies to retain customer loyalty.

Steelcase and SCA apply insight to users and their users’ behaviour to be able to best support their customers. Both companies are also very conscious of how to manage relations with the multiple stakeholders in their customer’s organisation and ensure that their value proposition benefits all. Both Vitsø and SCA use their own information systems that capture relevant information about the

product and customer's consumption/purchases. This information is used to leverage their services and allow both companies to better support their customers.

An interesting aspect with Vitsø is that the transfer of product ownership from company to customer is not necessarily in opposition of prolonging the product's life. Vitsø's products are particular in the way they are design icons that customers develop emotional attachment with, so customer ownership actually fosters long product use (similar to the ideas of Jonathan Chapman (2005)). Services are seen here as a manner to enforce these emotional attachments to the company and its products.

The case studies presented here do not represent a general approach to sustainable consumption and production. Even though they do actively contribute to a reduction of individual customers' consumption of products, all companies currently base the majority of their business on product purchase and use services to support the sale of products. Although Steelcase and Vitsø are considering providing the use of their products (and not the sale of their ownership), services on their own in all the three companies are not considered strategic profit generators. As long as the business is based on product sales there is also a limit to the amount of services that can be provided, even though the value of the services might actually be of more value to the customer than the product itself. Nevertheless each case study serves as exemplars of ways to do business in a more sustainable manner by addressing the consumption of individual customers. In times of economic restraint (such that we are currently experiencing) and resource scarcity (such that we will be experiencing in the near future) this might well be a more common approach to business.

5 Conclusion

The three case studies presented here provide evidence that a potentially lucrative business strategy for manufacturing firms is to not just sell as much as possible but to address the consumption of their own products and thereby ensure proper use and reduce unnecessary waste of natural resources. All the companies described manufacture fairly low-tech, uncomplicated products but even in this situation, the cases show large savings can be achieved for customers by influencing their planning and use activities of the products. In each case services played a big part in the delivery of products to support the customer throughout the total life cycle of the products. It would seem that this approach of production and delivery efficiency combined with consumption sufficiency could hold business potential for many other manufacturers to achieve environmentally and economically sustainable consumption and production.

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