Sustainable Service Design
What it is and where it’s going

A Survey

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PUBLISHING INFORMATION
Published by: United Nations Environment Programme
Working Group on Sustainable Product Development
Report Formatting Completed: 10/7/1997

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Pictures on Cover:
Rank Xerox Manufacturing B.V. The Netherlands
Grammer Office Chairs GmbH, Germany
Garment Care, USA
Acknowledgments

Special thanks to Nick Mahony, Han Hegeman and Tjitske van der Werff.
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About this Survey

During the UNEP-WG-SPD (UNEP-Working Group on Sustainable Product Development) workshop on Sustainable Service Design held in Amsterdam in August 1996 it became clear that there is a need to make this concept more tangible, understandable and accessible. Therefore we decided to use our international network to examine the general state of current initiatives and ideas, as well as look for examples of service design that illustrate this concept in practice.

In order to do this, in January 1997, we asked 120 UNEP-WG-SPD network members about their ideas on Sustainable Service Design. The questions were to a large extent formulated on the basis of the outcome of the August workshop:

1 Can you tell us about any examples of services that you would consider sustainable?

2 How would you give content to Sustainable Service Design (SSD)? Do you think such a development is a potentially rewarding step towards a more sustainable pattern of consumption and production?

3 What are the similarities and the differences between the meaning of Sustainable Service Design for developing and developed countries?

4 What role do you think the informal sector will play in relationship to Sustainable Service Design in developing and developed countries?

5 Can you identify new services to replace traditional products?

6 Can you identify new areas of need that can be addressed by services?

The people we asked these questions included policy makers, pioneer organisations (companies, Non-Governmental Organisations (NGOs), and consultancies) and researchers. We received 20 responses to the survey. (1 policy maker, 8 pioneer companies, 3 pioneer consultancies, and 8 researchers).

Unfortunately there were only 3 responses from developing countries. However, all the responses have made a positive contribution to a better understanding of sustainable services, and they are outlined in this survey.
The survey has also laid the foundation for a future UNEP-WG-SPD Expert Group on Services, coordinated by Professor Ezio Manzini, Politecnico di Milano (Italy). This Expert Group will be aimed at propagating awareness and composing new visions, as well as collaborating in research projects on Sustainable Service Design.

The survey is published on the home page of the UNEP-WG-SPD (http://unepfrw.uva.nl) as well as distributed in hard copy (200 copies).
Introduction by Hans van Weenen and Nick Mahony, UNEP-WG-SPD

Background
Over the last 300 years, through the process of industrialisation in the North which separated acts of production and consumption, many businesses have competed to offer benefits to consumers in areas such as nutrition, mobility, entertainment and time-saving.

Since the second world war, the orthodox paradigm of the industrial market has dictated that acquiring such benefits necessitated consumers owning more and more products. Increased business competitiveness and consumer affluence in industrialised countries, combined with technological advance, have continued to accelerate in a frenzy of constant product remanufacture and consumer repurchase. However, it is now becoming clear to a growing number of companies and consumers alike that this system of delivering benefits to consumers through product ownership is not, in fact, as economically or environmentally efficient as was once imagined.

The current environment
Such concerns about the inescapable wastefulness of our contemporary industrial system have led, particularly over the last couple of decades, to the development of a number of design strategies attempting to optimise the efficiency of our methods of production and consumption. These efforts have led to improved product recycling, designing for disassembly, product take-back schemes and even to campaigns aimed at raising the environmental awareness of consumers through, for instance, more informative product labelling.

The business of the future
However, the gradual realisation that such optimisation strategies alone might not be sufficient to deliver long-term sustainability has recently led to research being directed towards generating alternative methods of delivering benefits to consumers - methods not mired in the conventional product, production and consumption models. The design of services that transcend conventional product ownership systems has emerged as an exciting new direction with huge potential.

The service design developments emerging from this UNEP-WG-SPD survey are imaginative and entrepreneurial. They embrace holistic, strategic design planning
in place of more traditional (and sometimes blinkered) product design thinking. Sustainable Service Design developments typically take into account the complex relationships among the different social actors involved in the system. In practice this results in closer relations with customers, breaking out of saturated ‘me-too!’ markets and creating new ones.

Any twenty-first century transition towards greener lifestyles and more sustainable patterns of production and consumption will require social as well as product redesign. The concept of Sustainable Service Design embraces this social and environmental duality and is now emerging as one of the most exciting, progressive and promising design movements for the twenty-first century.

Services and sustainability

Services usually involve combinations of contact, communication and interaction between individuals or groups, of providers and users. Sustainability covers the reduction, change and development of the use of natural resources in their local context. Its objective is to maintain and enlarge their long term and diverse potential for providing human life and community support in an equitable fashion. A sustainable service concerns the person, organisation or process that aims to fulfil basic human needs with sustainability in mind. Sustainable service developments have to deal with the material objects, infrastructures and systems that already resulted from mostly unsustainable interaction with the environment. New sustainable service developments will lead to product-service combinations that are inherently more sustainable.

Existing and new services

Existing transport services, such as bicycle renting centres and public buses and trams, are already a relatively sustainable means of transport. However, a new service in this field might consider trying to realise the idea of De Groenen (the Dutch Green Party) in which users of public transport are also shareholders of their own bus company and have a say in the routing and scheduling of the buses. This would secure their mobility between home and work or other destinations. The dividend they would draw from their shares would be received in the form of use of the transport services. A user card (which could also be obtained by buying sustainably developed products) would monitor their use of the service as well as giving them the right to use the transport system. The whole system would be organised, maintained, evaluated, and continually improved as part of the service.
**Material Services**

Many services may contribute to improving the environmental impact of products to the extent that they prolong the life of products and materials by maintaining, refurbishing, repairing, reusing, recycling and recovering them. Others offer the (shared) use or results of products (such as washing, cleaning and painting services). However, in many cases, the products involved should perhaps not have been produced in the first place. It is therefore important to assess the sustainability of existing service-product combinations and to use this assessment in the development of new, more sustainable services.

**Non-material Services**

Personal, collective or communal services such as education, organisation of a participatory development process or of a community action programme, can stimulate creativity, empower people, and build human capacities. Such services can be further improved by developments that encompass international, intercultural and inter regional co-operation and exchange. Scientific research, advice, consultation and communication can, in this respect, take the form of services that contribute to sustainable development.

**Sustainability supporting services**

In the industrialised world, the amount of material and energy and the diversity and complexity of synthetic chemical products must be substantially reduced. At the same time, the material and energy already stored in products, structures and systems must be used as long, effectively and efficiently as possible. The basis of the use of resources in the industrialised world has to be fundamentally changed, away from non-renewable and scarce resources and towards renewable materials and energy. New services must be developed to introduce and support such changes.

In the developing world, existing activities that use little material or energy should be further improved and developed, while new services are developed which are based on changes in the way resources are viewed and used, and on indigenous knowledge and skills in their local context.

Enormous opportunities are presented by comparing the developed and developing worlds, and by complementing, merging and combining ideas from both, but chiefly by focusing on the most sustainable combinations of the knowledge systems they offer.
1. Can you tell us about any examples of services that you would consider sustainable?

The examples are divided into five categories:
1. Product Life Extension Services
2. Product Use Services
3. Product Life Extension - / Product Use Services Combination
4. Intangible Services
5. Demand Side Management Services / Least Cost Planning
6. Other Services

1. Product Life Extension Services

This category includes technical assistance, repair, maintenance and disposal services.

Remi Blancon, Institut Conception, Mechanique et Environnement, France.

The Institute teaches environmental product design.

"In France there is an association called 'Emmaus' whose members are unemployed people who recover old things and refurbish them for sale. It reintegrates goods into the consumption area instead of leaving them in the waste flow and reintegrates people into the society, too. A double movement towards a sustainable world."

Margaret Flaherty, World Business Council on Sustainable Development (WBCSD), Switzerland

The WBCSD work programme encompasses policy development, business strategy (environmental management), and sustainable development demonstration projects, particularly in developing and emerging economies. In April 1996 the WBCSD published the report: 'Sustainable Production and Consumption, A Business Perspective'. The WBCSD contribution to this survey consists of sections from this report.

"Hewlett-Packard created its hardware recycling organisation to process excess products and parts into useful service parts by disassembling and refurbishing them. This programme improves HP's service levels by increasing the availability
of parts while lowering costs. Overall, 98 percent of the materials received each month are reused or recycled.”

Nils de Caluwe, Manchester Metropolitan University (MMU), Department of Mechanical Engineering, Design and Manufacture, U.K.

Nils de Caluwe is a member of the Design for Environment Research Group at MMU. This research group works closely with British industry to improve the environmental performance of products. The original focus of the work was design for disassembly. This has since broadened to incorporate life-cycle issues.

“The Auto Recycling Netherlands company organises the recycling of cars and parts after usage. The financial resources for this project come from an extra Dfl. 250 price rise legislated by the Dutch government for every new car sold.”

Wendy Brawer, Modern World Design (MWD), U.S.A.

MWD takes an ecological approach to the design of resource efficient services and products. Their main focus is ecological stewardship in daily life and in the work of designers.

“There’s a clothing recycling company in the Netherlands called ‘Pluto Cat On The Earth’, which takes your old jacket and makes it a safety jacket by adding reflective shapes to it. You can be seen at night on your bike, even without a battery-powered light.”

“Outstanding Renewal Enterprises takes your food scraps and composts them. People who leave scraps get four pounds of compost free each quarter, otherwise, it’s one dollar per pound. They just got $70,000 from the US State, and will make their operation much bigger by collecting from restaurants. They give the parks department a lot of compost too.”

( http://www.earthbase.org/guests/ore/ )

P. Petit, Van Bommel, The Netherlands

Van Bommel is a shoe manufacturer.

“Shoe Manufacturer Van Bommel promotes good shoe maintenance at home and the choice of a good shoe repairer. Also, the reuse and recycling of shoes are stimulated.”

( url: www.ecomarket.net/design/bommel.html )
Radio Shack recently branched into the business of fixing out-of-guarantee consumer electronics made by all manufacturers. Their goal is to capture $500 million of the estimated $3.8 billion annual market for the repair of audio services.

Hanna Anderson, a US mail order marketer of children's clothing, will take back outgrown Hanna clothes. The customer gets a 20 percent credit toward future purchases, and the clothes are donated to needy children. Since 1986 the scheme has generated $1 million in credit to customers, and more than 200,000 pieces of clothing have been redistributed.

Product Use Services

This category includes services which enable consumers to share, use or get the results products can give us without the need to buy them for themselves.

WBCSD, Report: 'Sustainable Production and Consumption, A Business Perspective'

In 1993 Roche introduced the 'Pharma Box', a reusable transport package for the delivery of its products to hospital and pharmacies. This reduces the annual use of corrugated cardboard and paper by 50 tons.

Working with suppliers, Xerox initiated a program of reusable containers and pallets for shipping parts between facilities and suppliers. This avoids the creation of 10,000 tons of waste and saves the company up to $15 million annually, quite apart from saving timber resources.

C. Dobruskin, Philips Corporate Design (PCD), The Netherlands

PCD is a multicultural work force comprising some 25 nationalities at 25 locations around the world. Besides traditional design disciplines they also investigate the field of human behaviour and culture, exploring the opportunities resulting from converging technologies and responding to contemporary concerns such as the environment.
"The classic delivery, collection and refill service for milk in glass bottles (in England)."

Rens Meykamp, TU Delft, Section for Environmental Product Development, The Netherlands

Rens Meykamp is doing PhD research on environmental product innovation and behaviour change. He looks at the implications of shifting from products to services for consumers and the industry, as well as at the positive or negative effects of this shift on the environment.

Car sharing or co-operative car pool/rental services are beginning to emerge in some European cities as an alternative to car ownership. These services are an example of an incremental step towards more sustainable methods of personal transportation.


Ralf Nielsen, School of Architecture, University of Southwestern Louisiana, USA

As Assistant Professor Ralf Nielsen teaches industrial design and develops a number of courses and studios on sustainable design theory and practice for third and fourth year students.

"The Lawn Care Rental Depot, located centrally in a neighbourhood, houses a limited number of push mowers and solar recharging weed eaters. Through an electronic interface and billing system, home-owners or tenants can rent these lawn care tools on a per-five-minute basis. The depot reduces the need for homeowners to own lawn mowers and other tools while at the same time still allowing them convenient access on a pay per use basis. The depot has the added benefit of acting as a meeting-place for people from the neighbourhood and can be operated on a local basis, thus enhancing the local economy. These services specialise in tools that would otherwise be too expensive for most people to purchase. People often regard purchasing these tools as financially unfeasible because they are used for such a short period of time (possibly only once or twice a year)."

Wendy Brawer, Modern World Design, U.S.A.

"Libraries are great services... all of NYC's now have internet access, too. Most Americans have forgotten what wonderful things are at the library."
"GE/Sanyo packages its rechargeable batteries in a post-back pack for recycling. Consumers receive a $3 coupon to be used for their next battery purchase and Sanyo gets an opportunity to hold onto its customers indefinitely."

3  Product Life Extension - / Product Use Services Combination

WBCSD, Report: 'Sustainable Production and Consumption, A Business Perspective'

"Interface, a commercial floor covering company in the US, working in collaboration with fiber producers, has created a new product line by remanufacturing products. The old product is converted into new carpeting or floor tiles by refurbishment, remanufacture or a fashion face-lift. The customer leases the product, or the comfort provided by the carpet. They are the first US corporation to sign onto 'The Natural Step.' (The Natural Step in Sweden educates the public and politicians about the requirements for an ecologically sustainable society, and it publishes papers, networks professionals, organises projects for children and others, and helps companies transform themselves in Green directions.)

(url: www.ifsia.com/intro-ph.html)

"Xerox has changed its product delivery procedures (leasing) in order to take back more equipment faster and it is also developing more effective product return processes. It is also extending product life through remanufacturing, equipment conversion (e.g. converting copiers into printers), the greater use of common parts in products, and material recycling."

(UNEP-WG-SPD Product Example Database: http://unepfrw.uva.nl/)

"Thorn, a subsidiary of Thorn-EMI, the largest renter of brown and white consumer durables in the UK, has launched an initiative focused on the responsible disposal of those products. The initiative will involve establishing city-based refurbishment workshops which recycle and manufacture 'end-of-life' goods such as washing machines and refrigerators and which employ people who have been out of work for long periods. The refurbished products are reasonably priced and affordable for low-income households."
"Saturn, a division of the US automobile manufacturers General Motors, collects used and damaged plastic materials from its automobiles for reprocessing and reuse in new vehicles. To transport these used parts, Saturn relies on a reverse-distribution system using trucks that previously returned from dealers empty. In 1995 Saturn decided to tap into the used car market. Additional repairs and reconstruction are also undertaken as needed to deliver a used car that meets Saturn’s quality standards. It is also looking at leasing or service programs that will provide greater access to used cars and parts."

4 Intangible Services

This means replacing tangible, material products with dematerialised versions, often by substituting products for labour-based and information services including knowledge work.

Remi Blancon, Institut Conception, Mechanique et Environnement, France

"The development of e-mail will cut the amount of paper and energy used either by postage or even by fax. You only transport some electrons - you do not need paper or gasoline."

Wendy Brawer, Modern World Design (MWD), U.S.A.

"Seattle Filmworks will process your 35mm film into prints, slides, or e-mail them back to you. You decide which format (or all) when you send them in. Get your images without matter!"

(url: www.filmworks.com)

Paul Eilbracht, Engineer and Consultancy Bureau, The Netherlands

Paul Eilbracht is a consultant on sustainable product development who looks at its implications for labour, its large-scale applications and its effects on social behaviour. The Consultancy Bureau specialises in smart design, with emphasis on the use of materials, energy, recycling and, last but not least, the consumer.

"We could pool labour on a regional level. For example, employee x is travelling to work from a to b, whereas employee y (doing the same sort of work) is travelling from b to a. They could swap jobs. Labour pools offer more insight into these possible improvements for more efficiency and reduction of mobility."
In this way logistics and planning might have a sustainable impact.”

**Rein Aarts, Sasburg Visser & Aarts (SV&A) Research and Advice, The Netherlands**

SV&A has partnered shoe manufacturer van Bommel and Tulip Computers in environmental projects that have identified the main environmental points and options for improvement in the entire international product chain.

“Facilities for teleworking are a good example of sustainable services. The yearly energy use of a computer is equal to the energy use of a few days commuting.”

**5 Demand Side Management Services / Least Cost Planning**

This category includes the relatively new business approach (often adopted by utilities) in which action is taken on the demand side rather than solely on the supply side. In such cases, the interest of the producer becomes that of guaranteeing the best possible service by reducing production costs, leading to a reduction in material and energy input.

Increased energy production costs and the difficulty of positioning new plants have led utility regulatory bodies to place a new emphasis on energy conservation as a way of obtaining kilowatts. A kilowatt-hour saved through efficiency is a kilowatt-hour that does not need to be generated by a new plant. Because the electric power generation business is no longer a declining cost industry, energy efficiency improvements are a cost-effective way to reduce the need for new generating capacity.

Increased efficiency also satisfies customer needs for reducing their costs. Where formerly the actual quantity of heating fuel was seen as the product/service provided, this is now replaced by the ‘thermal comfort service’.

**Peter Reppe, University of Michigan, National Pollution Prevention Center for Higher Education, USA**

The US Environmental Protection Agency (EPA) and the University of Michigan School of Natural Resources and Environment have created an educational program that promotes sustainable development by educating faculty, students and professionals about pollution prevention.
"Various small companies in Germany have a 'Heat-Supply-Program' for buildings. A given company is fully responsible for providing heating for peoples apartments. 'Fully responsible' means that this company owns the boilers and purchases the oil or the natural gas from the local utilities. Since heat-meters are installed in every apartment (to measure consumption), it's now in the interests of both the company and the individual to lower the consumption of heat. The individual is charged for exactly what they have really consumed, as opposed to the old system, in which the oil bill for the whole building was divided among the inhabitants according to the area of their apartments, thus penalising careful people. Also, because it’s cheaper for the heat supplier to install heat insulation in the building in order to buy less oil or gas, it saves energy.

The heat supplier purchases and runs one or more boilers (larger than the ones for individual houses), meaning that in a given area of a couple of houses there is only one small central station instead of a boiler and its entire equipment for every single house. Applied on a small scale, this principle not only saves equipment (one boiler instead of fifteen), it also profits from economies of scale (due to the different daily schedules of the households involved, boilers can be operated for more hours each day).

Several Least-Cost Planning approaches are well documented by the Wuppertal Institute for Climate, Energy and Environment (Wuppertal, Germany).

"The 'Solvent Management Program' of Chrysler Corp, USA, provides solvent cleaning services. The service being provided is supplying cleaned automotive parts, rather than selling solvents, or selling specific cleaning equipment. The Solvent Management supplier (SMS) owns all the painting and cleaning equipment, operates it, and is therefore fully responsible for the consumption of paints, solvents and energy, and for maintaining the equipment. The supplier is paid a flat rate per unit produced. The SMS gets - for example - $100 for each car body that leaves the Chrysler plant. Thus, the SMS has the incentive to reduce its expenses by reducing the consumption of paints, solvents, and energy, in order to make more profit, because their income remains the same $100. To reduce or keep down consumption, they are always interested in having modern, low consumption equipment. On the suppliers side, the financial incentive to reduce consumption of solvents is a reduction in VOC emissions through changes in technology."

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“A similar service is used by the Ford Motor Company, USA, in this case known as the ‘Total Fluid Management Supplier’. The suppliers provide painting services. They are paid a flat rate per unit painted rather than by the amount of paint used. Thus there is a financial incentive on the suppliers’ side to reduce consumption of paint solvent.”

6. Other Services

Francesca van Dijk, SustainAbility Ltd, UK
SustainAbility Ltd. is a European environmental communications and consultancy company. Their aim is to promote environmentally sustainable economic growth, or ‘green growth’. Their publications and consultancy work include policy and strategy formulation, environmental auditing, mediation, consumer and market research, issues briefing, communications and training.

“Advertising and marketing campaigns can alter long-term purchasing decisions and customer values. They can change consumers’ perception of buying services rather than products.”

Rein Aarts, Sasburg Visser & Aarts (SV&A) Research and Advice, The Netherlands

“Influence of procurement policies on purchasing decisions.”

“Retail establishments can educate and act as a voice for customers, creating a pull from the marketplace for more eco-efficient products and sustainable produced services.”

“Tulip computers added an environmental paragraph to its product manual in which the user is informed about his/her influence on energy consumption.”

C. Dobrusskin, Philips Corporate Design (PCD), The Netherlands

“Working on bonus points instead of money for local services. In England, Local Exchange Trading Systems or LETS are operating in a number of small communities for services like baby sitting, repair of small electric goods, gardening work, knitting sweaters etc. The environmental benefits which result from increasing self-reliance include reduced transport cost and making environmental and social externalities more visible so that they can be incorporated into production
decision making. LETS has worked to keep wealth local, in contrast to many environmentally damaging projects that are often paid for by the host communities while the profits are exported. Local currencies can only persist in a context of mutual satisfaction.”

David Porter, Garment Care, USA

“Basically, Garment Care wishes for two things: one, a low-cost process capable of cleaning most all types of clothing and linens; and two, a convenient system of pickup and delivery to consumers’ homes.”

“The Smart Box is an idea for getting goods to the homes of consumers. It is a system for delivering laundry, groceries, etc. It is placed outside the house and the delivery person leaves the items inside when no one is home. This is actually an old idea, comparable to milk boxes for dairy products in earlier days.”

Wendy Brawer, Modern World Design, U.S.A.

“MWD’s major project, the ‘Green Map’ system, invites voluntary design teams to create a fresh perspective of their home town by charting the city’s ecologically significant places in a context that illuminates the interconnections between nature and the built environment. Utilising a shared language - a set of a hundred icons that symbolise the different kinds of urban green sites - they are creating unique, regionally favoured images that fulfil local needs, yet have a global linkage. The resulting Green Maps help residents discover great ways to get involved with the urban ecology, and guide tourists (even virtual ones on the internet) to successful greening initiatives they can replicate back home. Green Maps have been published for Athens, Copenhagen, Utrecht and Gouda (The Netherlands). Sixteen other maps are in progress.”

Community Supported Agriculture (CSA, known in the UK as ‘box schemes’). Members of a local group buy shares of a farmer’s crop in the Spring. Each can then pick up a box of the resulting produce from a central location throughout the harvest season. In NYC there are now 6 CSAs you can join, in different neighbourhoods, with different farmers. A share is $360 for the year. My
neighbours who did it last year got a box of organic fresh vegetables every week for nearly 6 months."

"Wet cleaning instead of dry cleaning for clothes is catching on here. The Greener Cleaner in Chicago is leading the R&D on this non-toxic alternative for the dry-cleaning industry. Over a hundred cleaners now offer this."  (http://cnt.org/sus_man/wet_cln.html)

**Henk Muis, P/M Consultants for Products and Environment, The Netherlands**

*Henk Muis gives advice and carries out research in the field of products and the environment. P/M focuses on cultural and social aspects of sustainable product development, sustainable consumption and life-cycle assessment.*

"In the Netherlands as well as in other countries (USA) a new phenomena is the bicycle courier for delivering letters and parcels. This seems to be quite sustainable, although e-mail is presumably better."  (url: www.pedicab.com)
2. How would you give content to sustainable service design (SSD)? Do you think such a development is a potentially rewarding step towards a more sustainable pattern of consumption and production?

Remi Blancon, Institut Conception, Mechanique et Environnement, France

“The design of services firstly allows us to use less materials, and secondly enables us to replace less environmentally friendly ones. Examples of the first type are using returnable packaging and repairing appliances instead of replacing them; and of the second are transportation by train instead of plane, and sending e-mails instead of faxes.

Replacing products by services is one step towards a more sustainable pattern of consumption and production. We have to limit or eliminate the most polluting products and then the less useful ones, replacing them by services in order to keep the same standard of living at a lower environmental cost.”

Nils de Caluwe, Manchester Metropolitan University, Department of Mechanical Engineering, Design and Manufacture, U.K.

“I would say that a more service-oriented society would improve the situation for environmentally conscious design, but there is also a danger of consumers losing the idea of the value of products. If you look at the attitude of people who lease cars nowadays, you can clearly see that they no longer care for the car the way they would if it were their own. By promoting Sustainable Service Design, it would be possible to work towards closing the material cycle, and therefore decrease the use of raw materials and resources. However, thought has to be given to the amount of energy that will be necessary to provide the service compared with the amount of energy that will be necessary to provide raw materials.”

Ralf Nielsen, School of Architecture, University of Southwestern Louisiana, USA

“Sustainable Service Design tends to lean towards a more holistic approach to the problems at hand than product design. It encompasses, right from the onset of the project and the definition of the problem, a greater part of the system within which a certain product/service is designed, produced, distributed, used
and disposed of. Sustainable Service Design places special emphasis on the context within which the mix of products and services are delivered to people. It places value on customer response and repeated customer satisfaction, rather than immediate satisfaction during purchasing and initial use of a new product. Service operators place special emphasis on meeting needs and achieving value for the customer. However, this is not to say that there isn’t still a great deal of potential to focus on perhaps unnecessary wants (such as the countless enticements, savings plans, touch tone features etc. offered by deregulated long-distance telephone providers in North America), especially in developed countries."

"Sustainable Service Design has, I believe, the opportunity to deal with other social, local economic and community issues. The relationships created between people and service providers is important and has the potential to strengthen communities, enhance local economies and provide meaningful work for people in the community. Providing a mix of products and services at a local level also opens up the possibility for co-operative ventures and stewardship that is so important to moving towards a sustainable way of living."

"I feel that the biggest opportunity for the promotion of SSD is in an entrepreneurial arena which focuses on local opportunities and needs, and enhances stewardship. I think that designers have the potential to act as entrepreneurs or as consultants to local businesses or community groups. There may also be potential to promote SSD to medium-to-large companies that see sustainability as an integral part of their business strategy and who are not locked in to a certain product-focused mind set. Perhaps companies who are incorporating concepts such as 'The Natural Step' (see page 15) hold such potential? They may be more open to the shift towards a product/services mix than most."

"In general I believe that Sustainable Service Design is necessary and feasible, and will be a rewarding step to take in the future. It will be one strategy amongst many which will grow and mature to find its particular niche in SPD. However, whether it will be rewarding to us depends upon how product/service alternatives are implemented and delivered. Service alternatives have the potential to increase our already chronic disassociation from the physical, natural and environmental world we live in today. We need to study carefully the impact that service delivery options will have on people and their relationship to each other and to their environment. Local service delivery ventures seem to hold the most promise to bring about more sustainable patterns of consumption"
and production.”

C. Dobrusskin, Philips Corporate Design (PCD), The Netherlands

“I think this step is evolving naturally in a number of areas, for example the influence of the internet on printed information. The shift to sustainable services will be particularly difficult though wherever you find an ownership tradition.”

Paul Eilbracht, Engineer and Consultancy Bureau, The Netherlands

“Products are now designed less and less to be repaired and replaced. Currently material possession is valued more than a service. Virtual possession (which is, in reality, the only type of possession) should be made more attractive.”

Peter Reppe, University of Michigan, National Pollution Prevention Center for Higher Education, USA

“Sustainable Service Design aims at satisfying specific needs of individuals, businesses, or society through the use of products that are designed and/or managed by the service provider. It utilises strategies to minimise the overall environmental burdens (for example, through source reduction, life extension and more efficient use). The development of such strategies is initiated and supported through appropriate allocation of financial incentives and responsibilities to stakeholders. A service-based system allows for utilisation of the expertise of the service provider and also shifts the responsibility for energy and material conservation to them.”

“Only services which reduce the environmental impacts of the entire system (production, use, end-of-life) are desirable. A complete change from the current mix of products and services towards a service-only economy does not seem feasible. All those needs that are satisfied by ownership of a product, or which are influenced by aesthetic, security, and other considerations will most likely not be replaceable by a service. Issues of self-realisation (such as the image of ourselves we project) and control of one’s life, come into play here, as well as the ever changing definition of needs. For example, having a cozy apartment may, for some, be a need that can be satisfied by an outside contractor, while others might not want a contractor to make decisions about their private sphere. It is, however, necessary to change the mix towards services that profit from
the incentives to decrease the overall environmental burdens of a given system. The promotion and realisation of those is a challenge for policy makers, entrepreneurs, and research institutions.”

“For the developed world there is an immense potential, based on the large number and variety of existing individual and corporate needs. Currently, in many cases, industrial operations are managed according to traditional patterns of ownership and availability of equipment, which results in an inefficient use of material and energy. Another aspect is that the developed world, with its extremely high level of per-capita consumption, still functions as a role model for the developing world, both in terms of the technological state-of-the-art and the consumption behaviour of individuals.”

“In the developing world the potential for sustainable services is grounded in the needs of a large population, which must be satisfied in a sustainable manner. There is an enormous potential for reducing the environmental burden, especially in the light of an inevitable increase of material wealth and level of technology in those societies.”

Kai Hockerts, University of Bayreuth, The Bayreuth Initiative for Business Ecology, Germany
Kai Hockerts is project manager for Eco-Efficient Services. The main areas of research so far are the influence of property rights on eco-efficiency, the conceptualisation of service concepts and eco-efficient services innovation.

“Services are only one stone in the mosaic of corporate sustainability. They do not automatically lead towards business ecological gains. This rather depends on each project. In any case, there is no general rule that a product is inferior to a service. Services probably exist already in developing countries because of a tradition of reuse and / or revalorization. Alas, this may change quickly for the worse.”

Cesar Levy Franca, Communications and Information for Environment and Development (Agenda 21 and NGO Treaties Initiatives) Brazil
Cesar Levy Franca is Projects and Training Director, Environmental Economics. He has developed a project under the local Agenda 21 Initiative with the Novo Encanto Community in the Brazilian Amazon forests, trying to empower local people through economic co-operatives and fair trade of sustainable products.
"In the Amazon there is a tremendous lack of professionals and resources to enable the strategic design activity necessary to organise and bring into practice the concept of sustainable services and better explore its national and international potential."

Henk Muis, P/M Consultants for Products and Environment, The Netherlands

"Sustainable Service Design is fulfilling a real need through an organisation and corresponding communication, while involving as little energy and matter as possible, in such a way that, on the demand side (consumers), a shift in consumption pattern evolves towards less energy and material intensive goods. However, one always has to bear in mind the rebound effect: the money thus saved may be spent on non-sustainable goods."

"I think consumers have to be seduced into spending money on services like theatre, live music, expensive dining out, story-telling, workshops, conferences et cetera, rather then spending their money on services like holiday trips to Mexico by plane, redecorating their homes every three years and so on. Services can be very unsustainable while hard products - such as jewellery - can be very sustainable - they last a lifetime and costs a lot of money which cannot be spent on petrol."

"Sustainable Service Design has great potential, both in the North and the South. In the North, it can help to restore a kind of badly needed social fabric and a redistribution of income. In the South, new services like teletyping can provide new ways of maintaining old existing rural communities and prevent people from a massive migration into bigger and bigger cities. After all, people don't want products, they want attention."

WBCSD, Report: 'Sustainable Production and Consumption, A Business Perspective'

"The fact that customers do not always recognise the value and benefits of services and therefore are often unwilling to pay for them needs to be overcome in order to increase the acceptability of services."

"Competitive trends in the telecommunications industry work against services: As a result of deregulation in this market in the US, Canada and Europe, leasing of telephones has been increasingly replaced by ownership. Leased telephones are designed to last longer because the telecommunications provider expects to get
the product back, refurbish it, and lease it to another customer.

Martha Helena Saravia, Paulo A. Romero, Gabriel Garcia, Pontificia Universidad Javeriana, Facultad de Diseño Industrial, Sante Fe de Bogota, Colombia

The Facultad de Diseño Industrial carries out consulting work on informal markets, environmental norms, government institutions, development policies, and enterprises for the development of cleaner production.

"It is possible to establish interdisciplinary working groups / a centre to offer the service of Environmental Industrial Development with an emphasis on sustainable design. (This is a Sustainable Design Service, not to be confused with Sustainable Service Design.) We believe such a service is necessary because of the risk of a new technological dependency on the clean technology coming from the developed countries."

"Sustainable Design Services could offer designers the possibility of proposing cultural changes in the patterns of production, consumption and final disposal. To achieve this goal requires an interdisciplinary local and international effort. Some patterns of consumption and publicity are opposed to dynamics of sustainable design. There is an almost unconscious resistance to accepting environmentally friendly products. We talk about environmental issues but our society’s actions do not promote an environmentally friendly lifestyle. Our future generations are beginning to prepare so they can protect the environment but still we need some immediate actions. There is a lack of design alternatives and information about the benefits of using an environment friendly service or product."

"It is possible to establish the changes that are needed, but we still need the people and the organisations to lead these environmental programs - programs that have to relate industrial process, products, patterns of consumption and final disposal."
What are the similarities and the differences between the meaning of Sustainable Service Design for developing and developed countries?

**Remi Blancon, Institut Conception, Mechanique et Environnement, France**

"Developing countries have kept traditional activities which can be seen as sustainable services since they use few materials. In developed countries, sustainable services have to replace the use of existing products which are harmful to the environment."

**Ralf Nielsen, School of Architecture, University of Southwestern Louisiana, USA**

"I do not have enough experience with regard to developing countries to form an opinion. However, I suspect that similarities can be found with emphasis on local communities, the importance of the social context within which the service is to operate, the enhancement of local economies, the opportunity to provide meaningful work, and on meeting local needs."

"The major difference, I feel, arises in meeting local needs. Needs are defined differently, depending on the social, economic and technological context that the service/product concept is to be designed for. In developed countries, the emphasis or target for Sustainable Service Design is to reduce environmental cost (by a factor of five to ten times); whereas in developing countries, I suspect emphasis will be placed primarily on meeting needs with a minimal environmental impact."

**Peter Reppe, University of Michigan, National Pollution Prevention Center for Higher Education, USA**

"The main similarities are the basic needs, such as food, shelter, health care, education, and mobility. The major differences are that the satisfaction of basic human needs takes place on very different levels (as a result of differences in culture, existing infrastructures and climate); and that these basic needs or expectations are changing more rapidly in the developing world, where people face very different challenges in their day-to-day life, hence the large differences in their perception of environmental problems and personal..."
involvement."

Henk Muis, P/M Consultants for Products and Environment, The Netherlands

"The key element of services is quality of living, both in the North and the South. Anybody can provide some kind of service. Unlike the production of mass-produced sophisticated consumer products, it does not exclude people from earning an income."

Martha Helena Saravia, Paulo A. Romero, Gabriel Garcia, Pontificia Universidad Javeriana, Facultad de Diseño Industrial, Sante Fe de Bogota, Colombia

"The need to protect our environment is a shared concern world-wide. To provide a Sustainable Design Service is a world-wide necessity as well. The Sustainable Design Service would be a service to all people regardless ethnic, cultural or national boundaries."

"There are several important differences, both in technological development and at the cultural level. The role of design in industrial procedures is not clear and we have not yet launched the concepts of life-cycle and clean production into the academic world. Although we have started to work on it, in practice there are big financial barriers."

"The Latin American and Colombian industrial sector has not been able to assimilate the world-wide open market policy and it is currently working to maintain itself in the market without an environmental approach. However, some companies have started to compensate by establishing Environmental Management Systems. The environmental approach in some instances comes from multinational companies and in few cases from national companies. However, there is a lack of information and government policies are not applied effectively."

Javier Ramirez, Famoc Depanel S.A., Santafe de Bogota, Colombia

For twenty years Javier Ramirez has been founding and developing companies concerned with the design and production of furniture and related accessories in Latin America. They have tried to make their staff aware of the relevance of their own cultural and physical environments. His companies are active in various countries (Colombia, Venezuela, Chile, Peru, Ecuador, Republica Dominicana and recently, Cuba). As an example of the company ethos, it is now replacing the gardens of the main factory in Santafe de Bogota by plantations of organically grown crops, so that the work force can learn organic agricultural
methods and can consume the products as well.
Javier Ramirez also teaches at the university.

"Some time ago, while on a return flight from Buenos Aires, I began a
correspondence with the person sitting next to me. He was a German man, about
forty years old, whose behaviour showed his experience in the rites and routines
inherent in international flight. Our conversation (as it always happens in
these cases) was about our professional activities and the reasons for the trip
we were sharing. He said something which made me understand many things about
Latin America: he told me he was selling food production packaging line
equipment all over the world. However, in Latin America, and especially in
Colombia he had never been able to sell the entire line. I immediately asked
him why, expecting the reason to be complicated. He then said that in Colombia
he would only manage to sell what the people would not be able to make for
themselves. He told me how much he admired the inventiveness of the Latin
American engineers who are able to sort out almost any technical problems with
their creative faculties."

"One can easily find relevant proofs of the resourcefulness of the Latin
Americans. After wide travels and experience in this field I have arrived at the
conclusion that poverty in resources has shaped the inventiveness of the
inhabitants of our continent to a great extent. A visit to Cuba is a good
example of this ingenuity. It is amazing to see how North American vehicles
fifty years old remain active without having ever received an original spare.
Passing through the streets of Lima in Peru is equivalent to taking an
accelerated course in informal economics, much of which is about achieving
resourcefulness in order to survive. It has led to meeting the needs of the
poorer classes by means of the refurbishment, reuse and recycling of goods which
elsewhere would have been discarded many years ago."

"Latin America is an emerging continent which does not yet feel secure in its
culture; therefore it has become culturally, economically and technologically
dependent on countries which have developed further, countries which conquer and
colonise her over and over again. There is a small and very wealthy upper class,
the cultural and ethical values of which are very close to those of Europe. The
middle class tries to emulate the North American way of life. A huge working
class would like to own that which belongs to the other two. Consumption habits
are very different in the different Latin American social classes. Whereas the
upper class gets dressed in a European fashion and mainly consumes imported
products, the middle and lower classes have to be content with owning what the rich people in their consumerism leave and discard after use. Reuse is natural in Latin America; it is part of the world-view of its people; it is the means whereby the poor resemble the rich somewhat. Creativity in prolonging the durability of second hand products has created an interesting economic circuit of use, reuse and recycling in which a large labour force is involved with the guarantee of a stable market and it has thrived in a never suspected manner. A thorough study of this topic could lead to a practical model which could assist the most advanced concepts of sustainability through service."

"On the other hand, the so-called globalisation of the world economy has led to the surrender of the incipient industries of the poorer countries to the enslaving pressure of the multinational corporations of the rich countries. Many native companies, while trying to find their comparative advantages, have found the service to be a salvation which has enabled them to survive. Poorer countries, their import taxes having been removed, and lacking competitive production technologies, collaborate with the multinational corporations in the exploitation of natural resources through the sale of primary services, many of them ecological, originating from their own environment. Thus they hope to narrow the technology gap with time, and to aspire to another level in the exploitation circuits. Thus the concept of the service seems to be a real hope for third world communities that expected better competitive opportunities. Any effort towards this aim, as well as providing an important source of employment, prolongs the life of the environment, the communities, and the products these communities use. This is essentially what is aimed at in sustainable development."
4 What role do you think the informal sector will play in relationship to Sustainable Service Design in developing and developed countries?

Ralf Nielsen, School of Architecture, University of Southwestern Louisiana, USA

"By informal sector, I assume you mean 'non-government'? Perhaps non-government and non-multinational/big business? If so, then I think this sector will play a large role in determining how and to what extent product/service alternatives are adopted and implemented in all countries. The initial ideas, concepts and inspiration for these alternatives will come from the local, community and perhaps district level. Government can however play a role by facilitating the new ventures through mixed use zoning, encouraging small businesses and subsidising startup costs or consultancy costs. I am sure there are many more relationships between informal and formal sectors that can make service alternatives a reality."

Henk Muis, P/M Consultants for Products and Environment, The Netherlands

"The informal sector could be an essential stage in developing all kinds of new services because it allows for experiments such as, for instance, the local currency systems like LETS (Local Exchange Trading Systems) or Noppes etc. (see page 19 - 20)

Martha Helena Saravia, Paulo A. Romero, Gabriel Garcia, Pontificia Universidad Javeriana, Facultad de Diseño Industrial, Sante Fe de Bogota, Colombia

"To talk about an informal sector in our country is very complicated. Such informality generated a strong influence in the country’s economy some years ago. Nowadays, new government policies have pressured the informal sector, creating a great imbalance in our economy. Some informal sectors have developed products with a craft character in both production and final presentation. However, this sector is aware of our environmental needs and it has to some extent adapted itself in this respect. On the other hand the informal sector has tried to respond to the poverty resulting from the violent phenomena associated with narcotic dealings, guerrilla and paramilitary organisations, among others. This situation has promoted the development of poverty chains in the marginal zones of the major cities. It has favoured the appearance of small production
nucleuses. These production nucleuses, added together, have generated an
important pressure on the environment which includes substandard human
settlements and a series of complex chains that, put together, do not favour the
macroeconomic behaviour. We encounter black market phenomena and cultural
penetrations that generate a complex interaction between the informal sector,
consumers, and government. They are often environmentally unfriendly."
5 Can you identify new services to replace traditional products?

David Porter, Garment Care, USA

"Idea for a renewed family laundry service called 'Fast Laundry'. Two goals: one, a low-cost process capable of cleaning all types of clothing and linens in a continuous flow from wash, through rinse to drying; and two, a convenient system of pickup and delivery to consumers' homes."

Ralf Nielsen, School of Architecture, University of Southwestern Louisiana, USA

"Personal interfaces that access shared computer facilities which replace traditional personal computers. (redistribution of the service/product mix)."

"Local utility companies that generate electricity from solar energy for a local community neighbourhood, replacing dependence upon large state-wide utility company that generate with nuclear power or coal. (service replacing service)."

"Local lawn care rental depot that replaces individual ownership of lawn care tools. (service/product mix replacing product)."

"Local walk-to laundry facilities that replace individual ownership of washing and drying machines."

C. Dobruskin, Philips Corporate Design (PCD), The Netherlands

"Video renting replaced by video on demand, and newspapers replaced by electronic newsletters."

(See also the PCD contribution to the book 'The Solid Side', 1995, ISBN 90 6611 364 2.)

Paul Eilbracht, Engineer and Consultancy Bureau, The Netherlands

"Information services could be adjusted to the needs of the individual. In this way the use of newspapers and magazines could be reduced. However the interface of Informatics (screen and access) needs to be improved a lot."
"I believe it is more important to discuss general strategies of eco-innovation. Services can then be one strategy. However, it would be dangerous to seek only for service options."

Henk Muis, P/M Consultants for Products and Environment, The Netherlands

"I think traditional products will never disappear, but we could try to make them in such a way that they last very much longer and with such attributes that they can easily be shared by many people. It is a matter of organisation and communication on the one hand, and product design on the other. The framework should not be products OR services but products AND services that, in combination, are more sustainable."

Ms. Hulscher - Emeis, De Groenen, Groningen, The Netherlands

"In the city of Groningen, De Groenen has developed the idea of regional collective transport. Passengers, as shareholders of public transport companies, would have influence on the quality and quantity of public transport. A foundation should be made responsible for exploiting the services offered by the various public transport companies. Share-holders would receive dividends in kind (free transport). Public transport companies are very positive about this idea. The system will result in public transport financed by the community (citizens, companies and government), leading to more money flows to public transport; more responsibility and stronger involvement of citizens, companies and government with public transport; better occupation and higher frequency in public transport; improvement and expansion of public transport against a reduction in individual mobility; and a better tuning of supply and demand."

Martha Helena Saravia, Paulo A. Romero, Gabriel Garcia, Pontificia Universidad Javeriana, Facultad de Diseño Industrial, Sante Fe de Bogota, Colombia

"In our country we need to promote a cultural change that would help us to go back to traditional practices of consumption and to promote the consumption of products that are environmentally friendly. There still are several regions in our country with traditional environmentally friendly practices. We have also
reached the point where some environmentally friendly products are accepted and wanted, such as recycled paper and packages. At present we don’t have any Sustainable Design Service, therefore, we should begin to provide such design services at all levels.”
6 Can you identify new areas of need that can be addressed by services?

Ralf Nielsen, School of Architecture, University of Southwestern Louisiana, USA

"In view of the increasing average age of the European population, I would say that there will be an increase in demand for service in domestic areas, such as food provision. I can’t think of any other examples though."

"The type of need varies so greatly, depending upon context, that it is difficult come up with general ideas. For instance, in Lafayette, most people see the automobile as a need. And indeed, due to the lack of sidewalks, crosswalks and footbridges, and suburban sprawl, it is very difficult to meet your basic needs without an automobile (even a bicycle becomes prohibitive due to the high speed limits on city streets). However, in Calgary, our need for personal transportation can be met by use of a bicycle, facilitated by a well designed and maintained pathway system and strictly enforced low speed limits."

"The context within which we work, live and design; and the society, community and so on affect our understanding of what a need is. We can draw the line and say that needs are those things that help us to survive, such as food, water, shelter and clothing, but then these are not really new areas of need are they? The way in which these needs are met, however, can be re-addressed to become more sustainable."

C. Dobrusskin, Philips Corporate Design (PCD), The Netherlands

"Changing fashions as well as structures in society, for example the increase of the population of the elderly, lead to new opportunities."

Peter Reppe, University of Michigan, National Pollution Prevention Center for Higher Education, USA

"On the corporate level, you can think of ancillaries such as air conditioning; heating and ventilation; sanitary services and cleaning; cafeterias; in-plant transportation and handling; waste management; office needs (furniture, copying, printing, access to computers, access to phone and internet and mailing); and the design of specified or standard components (through external engineering
contractors, consulting firms). On the individual level it is more complicated to 'outsource' the satisfaction of needs, especially when it involves people's attitudes about appearance, security, and control. Examples of needs that could be satisfied by services are mobility, thermal well being, fresh food, clean dishes and clean clothing.”

**Wendy Brawer, Modern World Design, U.S.A.**

"The need for new education services for older people - perhaps the Danish Folk High School is a good example. I'd like to see a citizen's community school where you learn about municipal housekeeping, extending the care of your house into the larger 'home' it is based in."

**Henk Muis, P/M Consultants for Products and Environment, The Netherlands**

"In transport: bicycle couriers, all kinds of taxi transport for one person or for groups of people, car sharing.

In growing, distributing and preparing food: more intense producer-consumer bonds, catering services and baking cakes for birthday parties etc.

In personal care: (we already have these services of course, but they can become much more important), taking care of your hair, nails, skin, hands, feet, muscles, moustache etc. in barber's shops, rest-rooms, gymnasiums, saunas and bath-houses etc.

In entertainment: story telling, theatre, singing, music performance, clowning and learning to draw or paint.

In education or personal development: workshops, conferences, therapies and hobbies."

**Martha Helena Saravia, Paulo A. Romero, Gabriel Garcia, Pontificia Universidad Javeriana, Facultad de Diseño Industrial, Sante Fe de Bogota, Colombia**

"In a country as needy as Colombia, a Sustainable Design Service has not been applied yet. Two of the areas in which we consider this service is needed most are the land and cattle sector and small and medium industry. These two demand such a service but it has to be offered in such way that it won't affect our economic interests. It also has to make evident the need for investment so that we can establish Environmental Management Systems and develop environmentally friendly products."

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