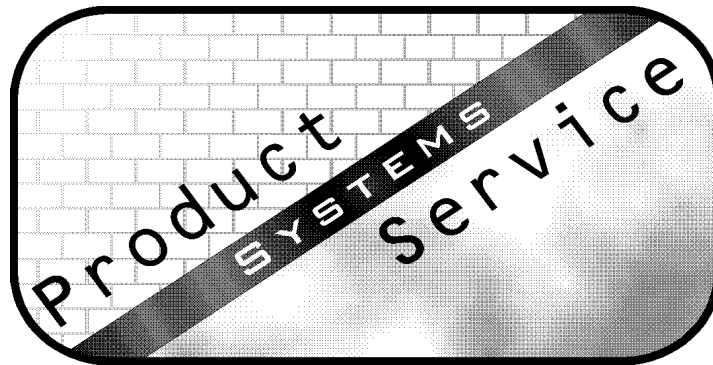


**Product Service systems,
Ecological & Economical Basics**

ANNEXE REPORT:

EXAMPLES DATABASE

QUESTIONNAIRE



(Authors in alphabetic order)

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March 1999

Examples database

During this project a lot of examples of existing product service systems or product service systems under development were found. This annex gives about 150 of them, illustrating the far spread penetration of PS systems in society. With this, it has to be remarked that most involved neither companies, nor other people address these examples as being a Product Service system. Sometimes concepts like product systems, Eco-efficient services and total offer are used. The following examples are to be used as an illustrating of the world of PS systems, not as being an ultimate list. In next table, the following entries are described:

Product Service system: a short description or the name of the Product Service system. In case of a unique PS system from one company, or unique co-operation of several companies, the name will be used. In other cases, a general name for this kind of PS system is given.

Long description: Over here details about the PS system, as well as details on history, benefits for consumer or company, extra features etceteras is given.

Company: this label covers one or a few companies that offer this PS system. More providers may exist. If several companies co-operate this is mentioned.

Type: the PS system is categorised on the method as was described in chapter 2: Ps, PS, pS, P to S.

Clients: the PS system can be designed for the private consumer or the business-to-business market. Both possibilities are given here.

Moment of added service: in case a service is added to a product, or the focus of the service component in the total offer is in a specific design phase in the product life, this is indicated. The phases in the product life are:

- Design: in most cases this will be an information service to enable the designer to make the product match as much as possible user and environmental demands.
- Production: service added in this phase is comparable to the previous phase. Another service is the production of products or services according to client wishes.
- Distribution: is a service in itself. When adding a service to the distribution phase, it implicates a service-service system. Specific customer-information makes these kinds of product service system more frequent.
- Sale: these kinds of services are often associated with information or mass-customisation. Also delivery services can be describes as services added to sale.
- Installation: information on how to install the product or the installation itself or dedicated courses are possible services. In cases where a second company get into the production process of a first one and contributes significantly, this can also be the case (for example: distributors take part in assembly of the final product)
- Use: When a service is present during the use phase, several types of service are possible:
 - Service and product together fulfil the needed function. The customer has a little saying in the way a function is fulfilled nor becomes (part-time) owner, he pays for the result only.
 - The PS system implies that a product is temporary at the user's disposal:
 - renting. In this way a group of users uses the same product.
 - (functional) leasing, this is a special kind of renting, where the provider takes a greater part of the responsibility of the product than in the case of renting.
 - sharing, this is a serial way of using products within a distinct group of users. The users together own a product, so they feel more responsible for well functioning.
 - pooling, this is a parallel way of using a pool of products within a distinct group of users.
- Maintenance: This box is active in case the product service system fulfils more functions than the reference product or reference service does. This is a so-called life extending service
- Repair: This is like the maintenance phase, a life extending service.
- Function extension: these services imply that products or services are upgraded by ways of new possibilities (new hardware or software, extra service)
- End-of-life: In most cases these services include a take-back service of the product or parts of the product for re-use, re-cycle or (guaranteed) specific waste-treatment.

In an Access database, shipped with this report some extra information is given. This information is about contact data (information about persons to contact within a company, including addresses) and originating literature. Most relevant literature, except advertisements, leaflets and non-profound articles in newspapers can be found in the references.

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use					Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
																			*	*	*	*
Service for returning compact disks	EMI is a producer and distributor of CD's. They take back redundant CD's from their distributors. EMI refunds the distributors for their costs. The CD's are being used to produce new products.	EMI	Ps	Business-to-business				*											*			*
Office facility management	Producer of office-furniture Gispén is doing a pilot project with a hardware supplier and a catering business to facilitate offices. Together they take care of all the maintenance and repair which have to be done. In case the demands of the users change, Gispén will change the office according to all wishes.	Gispén Culemborg, division S.I.- industries Denmark	P/S	business-to-business						*	*				*	*			*	*	*	*
Reversed logistics product packing	Texim Electronics is a wholesaler of electronic parts. These are distributed in plastic containers provided with a chip, which holds information about the sent packages. The customer can return the plastic boxes with empty packing. In this way the wholesaler has all the information about the stocks of his customers, and is able to provide new services with this information.	Texim Electronics	Ss	business-to-business				*											*	*		
Take-back service furniture	Furniture producer Assenburg (connected with Aspa) obliged themselves to take back old furniture from the defence ministry in the Netherlands. Even other brands furniture are taken back.	Assenburg, Tilburg	Ps	business-to-business				*											*			*
Return service gardening material	Rockwool Grodan produces germ embeddings for professional gardening. Most producers of these materials refuse to take back the used embeddings. Rockwool guarantees materials can be returned. The secondary materials are reused in stonewool products.	Rockwool Grodan	Ps	business-to-business															*			*

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Return guarantee plastic garden furniture	Hartman is a producer of plastic garden furniture. "Hartman Groengarantie" is a return guarantee for their own furniture so these can be reused in new furniture.	Hartman Groep NV	Ps	consumer															*	*		
Flexible lease contract family cars	Mercedes is working on a flexible lease concept for families. Every moment a family can choose a car they need according to their specific wishes at that moment. A baby-Benz in case not much space is needed, or a station wagon to be used on holidays.	Mercedes	Ps	consumer				*			*	*										
Furniture maintenance service	Wilkhahn, producer of office furniture, sells a maintenance-subscription to the sold furniture. Yearly this service will replace parts that are worn out.	Wilkhahn Business Centre, Gorinchem-Oost	Ps	business-to-business							*					*	*					
Pallet-pool	Chep provides a worldwide pool for transport pallets. Besides, they provide other transport packages as well, like plastic containers. None of these products are sold; a deposit has to be paid.	Chep Benelux Netherlands BV Leiderdorp	Ps	business-to-business							*		*									

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Professional coffee systems	Suppliers like Douwe Egberts Coffee Systems International BV facilitate coffee systems with equipment, ingredients, refilling and maintenance. These systems are developed by themselves or in co-operation with specialised industries. The users can buy or lease the coffee system. Some suppliers also take old machines back after use, for recycling and reusing. Some of the companies were coffee suppliers, other producers of equipment.	Olland Nieuwegein DECS Maas Services International Cafe Bar Holland	Ps	business-to-business			*	*	*		*					*	*			*		*
Customised computer configuration	Dell Computers sells computer configurations completely according to all wishes the customers have (for example after an E-mail dialog).	Dell	Ps	both		*																
Reversed logistics of building materials	Stybenex Construction, an organisation of 5 producers, takes back EPS from construction sites. These EPS parts are cut-offs, and spare parts. This pilot project will start in 1998.	Stybenex Bouw	Ps	business-to-business					*										*			*
Voice mail service	AT&T, producer of professional digital telephone exchange equipment, provides a voice mail service in their equipment, so answering machines are no longer needed. A hardware-product is replaced by software in another product.	AT&T, Alcatel	STC H	consumer																		

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Bike renting added to public transport	Interliner, a Dutch fast bus service, tried in 1997 to set-up a system for bike renting in connection with their bus service. It's been a disaster. One bike was rented in the experiment period.	Interliner Utrecht	Ss	consumer							*											
Gas advising	The Gasunie, supplier of gas in the Netherlands advises all users about technical aspects of using gas and possibilities to spare on use of it.	NV Nederlandse Gasunie, Groningen	Ps	both							*											
Customised building elements on demand	Unidek delivers complete and customised roof- and other elements needed on the building site, for houses as well as for larger buildings. Waste materials are taken back to be reused.	Unidek Bouwelementen BV, Gemert	Ps	business-to-business		*													*	*		
Copier leasing	Many suppliers of copiers don't sell copiers anymore, they sell copies: In this way the suppliers take care of the maintenance, the availability of toners and a 'state of the art' guarantee. They take back old copiers, disassemble them, and reuse the good parts in new copiers.	Océ-Nederland BV Rank Xerox	Ps	business-to-business					*		*	*				*	*		*	*	*	*
Reprocessing of flip frames	3M Germany has a so-called "Flip frames Verwertungsservice": Taking back the protection foils on overhead-sheets. 3M reprocess these foils.	3M	Ps	business-to-business															*			*

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use				Maintenance	Repair	Function extension	End-of-life			Re-use	Treatment	Re-cycle	
Information in stead of physical money	Almost all National Banks made it possible to pay electronically in stead of using physical money. Coins and banknotes aren't needed anymore. The product is replaced by a service.		STC H	both																				
Service for promotion and information requests	The PTT (the Dutch Mail co-operation) delivers a lot of not requested promotion materials. This method of promotion costs a lot of materials, energy and money, because it is delivered to very many uninterested people. Therefore PTT developed a telephone service, called "Toets". Here people can order their specific promotion material or information. The service is also available on Seefax and Internet.	PTT and Moore Corporation Ltd (Canada)	Ps	both			*																	
Carsharing	To use cars more efficiently, many car-share systems are developed. This concept can be a satisfactory solution for those people who sometimes want to use a car, but don't want or need to own one. A group of users have the disposal of a fixed number of cars. Users make a reservation for the time they would like to use the car.	Greenwheel s, Call-a-car, traditional car rent companies	Ps	consumer							*				*									
Company and product information systems	To be able to control all company data, management information systems are developed in many software houses. This kind of software controls all relevant information about products, personnel, finance etc.	InControl, Baan, SAP	Ps	business-to-business		*	*	*	*		*				*	*		*	*				*	

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Cash converters	The Cash Converter concept is based on a cradle-to-cradle philosophy. Once not rejected even defect products can be brought to a Cash Converter shop. In return people receive a little amount of money. The products are repaired, or will be used as 'part-supplier' for other products.	Cash Converter	Ps	consumer													*		*	*		*
Leased carpet	A new building of Southern California Gas, the Energy Resource Centre in Downey, is provided with a carpet not owned by the Southern California Gas, but the carpet manufacturer Interface Flooring Systems Inc. Under the terms of the "Evergreen Lease" Southern Cal Gas paid no money down for the carpet, but will pay a monthly stipend to cover installation, maintenance and ongoing repairs.	Interface Flooring Systems, Inc	Ps	business-to-business							*	*				*	*					
MERCI (Medical Equipment Recovery of Clean Inventory)	At the University of Virginia, a system is set-up to recover, sort and divert clean medical supplies. An information system provides the person who has to separate the goods with the knowledge where the products should go to, for example: a local free clinic, a wildlife centre, missions or research labs. Items that are over-dated are re-sterilised. This service is added to the end of life phase.	Health Sciences Centre University of Virginia Charlottesville, VA 229 8	Ps	business-to-business															*	*		*
Printing on demand	In the near future, (some) books will be published on the internet. Because most people want to read the paper version, it will be possible to have the book printed from the internet, according to all the readers demands (for example bigger letters for those people with bad sight) in a shop nearby the customer. Even PoD printers can be leased (with the PoD-printers made by IBM - the InfoColor 7, the InfoPrint 4 and the InfoPrint 6	IBM, KICK Automatisering	Ps	both		*	*	*			*	*										

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle	
e-mail reminder service	On an American Internet site (http://www.gbs.com/flowers/remind.htm) it is possible to enter special dates of your relatives. A specified time in advance you will be notified of his/her birthday and you can reply on the E-mail by ordering flowers that will be sent to the person in question.		Ps	consumer			*	*															
Economy measurement in washing machines	Miele developed a washing machine that notifies the user of the energy that is being used at the moment and advises the user about moments it is possible to do the washing more economical.	Miele	Ps	consumer							*												
Take it @ Leave it	Because many people are so busy working, they don't have any time for having their shoes repaired, to buy a cake for their birthday, to have their photo's developed etc. etc. For these people the Service Shop 'Take it @ Leave it' is introduced on train-stations. People can order the service or product they want in the morning, going off for work, and take it away when they return for going home.	Take it @ Leave it	Ps	consumer			*	*															
Rolls Royce for life	Once bought a Rolls Royce, this car should serve you for life. That's why RR set-up a world wide service system so that the car can be repaired always and everywhere.	Rolls Royce	Ps	consumer							*					*	*						
SKF system 24	Lubrication in the right place and on the right time is very important to mechanical products and bearings in special. Normally this has to be done by someone, now a product replaces this service.	SKF Maintenance Products B.V. Mijdrecht	S to P	business-to-business							*					*							

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use				Maintenance	Repair	Function extension	End-of-life				Re-cycle	
Guard in stead of machines in public transport	In Dutch trams and underground services people should stamp their tickets for validation. The travellers did this themselves in a machine. Because of several reasons (abuse, safety, information) the guard returned on a lot of trams.	GVB Amsterdam	STC H	consumer											Pooling	Sharing	Renting	Lease				Re-use	Treatment
ECO-it software	ECO-it is a software package developed by PRé consultants in Amersfoort to help designers be more aware of the environment in the design decisions they make. De method of Eco-indicator 95 is being used to describe the environmental impact.	PRé Consultants	Ps	business-to-business	*																		
Napkin service	Dutch parents throw each day 3 million napkins away. To reduce this enormous waste problem they developed a service with old-fashioned, durable cotton napkins. The service takes care of the napkin washing. The clean ones are delivered while the dirty ones are taken away.	Culotte luierservice	Ps	consumer			*				*	*			*							*	
Sony "exchange & refurbishment" program	The repair of a defect product can be very complex and time costing. That's why it is more efficient to centralise this kind of services. To do something about the long repair time, Sony has stock of already repaired, second hand products that can be returned immediately.	Sony	Ps	consumer												*							
Termite control by Dow Elanco	Because termites can damage buildings dramatically and chemical barriers to prevent termites infestation have environmental, safety and cost disadvantages, Dow Elanco has been looking for a new concept. This has been found in hexaflumoron that disrupts the growth mechanics of the termites, so in the end they die. A service is added to educate the market in using this new product.	Dow Elanco, USA	Ps	business-to-business					*		*												

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
RTT Satellite information system	RTT is a Dutch distributor of bulk-liquids and dry products. To track all the trucks RTT uses a satellite system. The information that such a system makes available creates the opportunity to use the trucks more efficient: The nearest by empty truck can be traced and sent to the load.	RTT Hoyer (Germany)	Ps	business-to-business			*															
Virtual school trip	To show and inform children aged 6*2 about more things than they could ever visit in a reasonable way, the Museum of Technology in Delft set-up a virtual school trip, so they can have the experience without being in all those different places.	Museum of Technology Delft	Ss	both																		
Network computer	Every standalone computer needs a hard disk, containing programs and other data. The programs are normally distributed on CD-ROMS. Distributing programs in this way costs a lot of CD's and hard disk space. To be more up to date and not having to use CD's anymore network computers are developed.	Microsoft, Intel, HP	Ps	both			*		*	*					*							
Flexible offices	There are several reasons for not always working in the same place: To be close to different customers, to be closer to home, to work together with different people in different projects etc. etc. For this reason within one office building, and even on a larger scale, flexible offices are created. These places can suffice in more specific demands than an ordinary office can. For example a meeting room provided with presentation equipment or a silent work place with a computer. Space can be used more efficient in this way	Gispen	Ps	business-to-business						*	*											

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Magazine collection and distribution	Many people want to read a lot of magazines. It would be very expensive to them subscribing to all magazines they are interested in. That's why some companies set-up a sharing system of magazines, so that they are bought only once for more readers.	De Leesmap	Ps	consumer			*				*			*								
Time sharing of luxury leisure time goods	A group of people can buy luxury leisure time goods like yachts, second houses, or private planes. Together they share costs and time of use. The goods are owned by a foundation created by the investors.	TMC	Ps	consumer				*			*			*								
Paint on demand	In paintshops Sikkens places machines that are able to produce the exact colour and quantity to fit to all users demands. In this way less paint is needed to create the right colour.	Sikkens	Ps	consumer				*	*													
Libraries for books, CD's, art etc.	A very well known product service combination is the library. This kind of organisation buys the products, and makes it possible for members to use these products.		Ps	both							*			*								
Re-furnishing of furniture	To be able to refurnish their products after some years of use, furniture producer Gelderland designs their products in such a way as to fit to these demands.	Gelderland, Culemborg Leolux	Ps	both	*											*	*					

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Software assistance	Environmental software engineering company PRé assists users of their software with reviews and software updates	PRé	Ps	business-to-business							*					*		*				
Assisting stamp-collecting	To encourage philatelists in collecting their post-stamps, the royal Dutch mail company PTT assists with organising exchanges and producing albums etc. These kinds of services are added to products (stamps) that are needed to provide the service of delivering mail.	PTT	Ps	consumer				*			*											
Inspecting mechanic and electronic equipment	Machinery builders make maintenance and repair service easier by enabling checking the product-status on distance, for example by telephone. A software update is possible as well in this way.		Ps	business-to-business												*	*					
Building contractors build and maintain	Some building contractors don't only build; they take responsibility for the maintenance as well.		Ps	both												*	*					
Supplier of yachts provides winter storing and maintenance	Some luxury ship suppliers don't only sell their yachts, they take care of the maintenance and winter storing as well		Ps	consumer												*						

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use						Maintenance	Repair	Function extension	End-of-life		Treatment	Re-cycle	
Bus shelter billboard-service by Alrecon	Alrecon takes care of promotional activities for companies who want to use bus shelters for this purpose. Alrecon takes responsibility for the repair and maintenance of these shelters.	Alrecon	Sp	business-to-business								Lease	Renting	Sharing	Pooling							Re-use	Treatment	Re-cycle
Railway companies produce timetables and software	To be able to plan a trip by train, you need to know the timetables. For this purpose railway companies develop these timetables.	NS	Sp	consumer																				
Railway companies develop their own trains	Because railway companies are very aware of all the demands a train has to fit in, some railway companies decided to do their own product development. The production will be contracted-out. An example of a train developed in such a way is the double-decker now operating in the Netherlands.	NS	Sp	business-to-business																				
Mobile phone networks	Many telecom companies compete with a free telephone when subscribing to their network.	Libertel, PTT, ANWB	Sp	consumer				*	*		*													
Distributors/retailers design their own trailers	To fit to the very special demands some large (retail) companies have about distribution, some of them decided to design their own trailers. Albert Heijn and McDonalds did this for example. For Albert Heijn this resulted in a so-called RoRo (Roll on Roll off) trailer.	Albert Heijn McDonalds	Sp	business-to-business																				

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use					Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle	
Wagon-Lits coffee trolley	To improve the drinks- and snack selling in trains Wagon-Lits decided to develop their own trolley to fit to all their specific demands. Due to the lack of experience in product development many start-up problems appeared and made these trolleys inaccurate and expensive.	Wagon-Lits	Sp	business-to-business												Pooling	Sharing	Renting	Lease				
Cleaning companies developing their own machines and detergents	To fit to all their specific demands, many cleaning companies develop their own machines and detergents.		Sp	business-to-business																			
Interactive multimedia possibilities	Internet provides possibilities to store and view television or radio or other multimedia programs that can be used in an interactive way. Viewers decide when to experience such a multi-media program.	KPN-Telecom, NOB Interactive and SURFnet	STC H	consumer																			
Locked bicycle	Many bicycles in Amsterdam are considered as a wreck. The police takes these (many times stolen) bikes of the street. If no one claims the bike, it originally was considered as waste. 'Fiets op Slot' (locked bicycle) is a commercial initiative to reuse these wrecks. About 1/3 of the parts need to be replaced, what's being done by 'Fiets op Slot'. The bikes are sold to dealers.	Fiets op Slot	Ps	business-to-business													*		*	*			
Security systems	Originally Lips was a producer of locks and other security-products. Because they defined their core business as securing people and peoples property they added security services to their products. Now Lips people are guarding buildings as well.	Lips security systems	Ps	business-to-business							*							*					

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Sustainable maintenance program social housing foundation	Social housing corporations have programs for sustainable housing maintenance. The buildings are not only refurbished in a durable way, they are upgraded as well, for example with a solar boiler or double glass panels.		Ps	business-to-business							*		*			*	*	*				
Bullet pads made out of tires	Kortenoord is an iron-processing factory. This company produces frames for rubber pads (made of tires) that are being used in police education for shooting practice. When the pads are full of bullets and powder, Kortenoord takes back the pads and wants to recycle them.	Kortenoord	Ps	business-to-business															*			*
Toll-roads in Portugal	The quantity of toll-roads in Portugal is growing. These roads are exploited by the road-builders themselves.		Ps	both							*											
Global Positioning System (GPS)	The Global Positioning System, GPS has been set-up by the U. S. Department of Defence. It can be used by anyone travelling to track his or her position. In combination with digitised maps it can be used to optimise route planning, so fewer kilometres are made.	Philips Ericsson	Sp	both																		
Leasing of baby goods	In some places it is possible to lease goods that are needed for baby's only. After they are grown up, the lease contract is ended.		Ps	business-to-business																		

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle	
Bartering circles	Bartering systems started in Amsterdam in 1993. A bartering group exists out of at least 1 people, who all can provide certain services and need certain services. If someone wants a job to be done, he/she can have a look in the bartering system, to find someone who can do this for him/her. The one who is doing the job will be 'paid' with positive points in the system, the other with negative points. He or she will have to do something for someone in the system to equalise his points total. This system can be used for products as well as for services.		Sp	consumer																			
Pay per view	Some operators of cable systems (like A2 in Amsterdam) provide the possibility for viewers to decide for themselves what they want to view and pay for. A device registers the programs viewed and sends this information to the operator so a specified bill can be made up.	A2	Ss	consumer							*				*								
Videobox with video rental	When renting a videotape people can rent an especially for this aim designed VCR as well.		Sp	consumer							*		*										
Leasing and rental by GE Capital Modular Space	General Electric is a lessor of many expensive and complex products. They are the rental- and/or leasing company of for example cabins ('yellow cabins'), trailers (TIP Europe), containers (Genitor), cars (Aroleasing), aeroplanes (Commercial air) and even satellites (GE Space)	General Electric	Ps	business-to-business							*	*				*	*						

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use					Maintenance	Repair	Function extension	End-of-life			Re-use	Treatment	Re-cycle	
Airmiles and bonuscards	To be more aware of consumer behaviour and consumers wishes some retailers (like Albert Heijn, V&D, Dixons etc.) register a lot of buying behaviour in a large system. With this information they can be more accurate in serving the customer.	Air Miles	Ss	consumer																					
Luggage delivering service	Tourists flying from Schiphol often take the car to the airport, or are brought and picked up by family or friends. Schiphol wants to stay accessible for everyone, so the car traffic has to be brought back. That's why the airport set-up a luggage delivering service. Luggage is being taken away from people's homes and will be processed in such a way that travellers have their luggage when they arrive at their final destination.	Schiphol	Ss	consumer																					
Retourette	In some shops of Albert Heijn in the Netherlands, as well in some shops in Austria, there is a possibility to return empty packages so these can be reused or recycled more efficiently than is possible with normal waste. This system is different from deposit systems because no money is involved for the customer. He/she brings back the packages completely voluntarily.	De Retourette Schiedam	Ss	consumer																					
Street lighting per square meter	The municipality of Bathmen, in Dutch Overijssel, decided to contract out the in lighting of the village to the energy distributor EDON. In this way large investments are made by EDON, who also takes responsibility for maintenance and repairs. The municipality pays fl.8 per square meter per year, and does not need to invest.	Municipality of Bathmen, Overijssel EDON	P/S	business-to-business						*	*					*	*								
Video renting			Ps	consumer							*		*												

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use	Lease	Renting	Sharing	Pooling	Maintenance	Repair	Function extension	End-of-life	Re-use	Treatment	Re-cycle
Garden leasing			Ps	both							*	*										
Central heating kettle lease	In order to promote expense environmental friendly kettles, installation organisations and energy distributors offers lease contracts.		Ps	consumer							*	*										
Fax, laptop leasing			Ps	both							*	*										
Home inventory leasing			Ps	consumer							*	*										
Kitchen inventory leasing			Ps	consumer							*	*										

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Scooter leasing			Ps	consumer							*	*											
Sewing machine leasing			Ps	business-to-business							*	*											
Leasing of tropical plants			Ps	both							*	*											
Sportswear leasing			Ps	consumer							*	*											
Sunlamp leasing		Zonnecentrum Sentjens	Ps	consumer							*	*											

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DEPO bicycle plan	DEPO is a follow up system of the 'white bicycle plan' set-up in Amsterdam. Because so many bikes are stolen and biking is a pretty good way of transport in Amsterdam, an organisation owns a lot of 'white bicycles', that can be used by all DEPO members.	DEPO	Ps	consumer							*			*								
Cabs	An old product-service combination is the taxi. The concept is so well known, it needs no description.		Ps	both						*	*											
HP toner	All laser printers need (quite expensive) toners. The refilling of these toners is not always very simple, and isn't a standardised process. That's why toners of Hewlett Packard are only rented to the users. They must be returned so they can be refilled	Hewlett Packard	Ps	business-to-business							*		*									
Camping equipment	Going on a camping holiday is not an everyday business. Therefore it can be more efficient to rent the needed equipment at the time it is needed.		Ps								*		*									
BO-rent machines	Many machines are expensive to buy, especially when they aren't used very often. BO-rent gives customers the opportunity to rent a lot of machines they wouldn't or couldn't buy for the job he/she has to do.		Ps	consumer																		

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Kodak recycle camera	Kodak produces cameras with a film included. The whole camera with film is returned to have the film developed and printed. The cameras can be reused with new films	Eastman Kodak	Ps	consumer							*		*						*	*		
Caravan	Caravans are very expensive goods to buy just for a two weeks holiday. That's why most new caravans are bought by older people --> They earned the money, and they have more time, so the investment will pay. The second hand market consists mainly of caravans bought by the elderly people and therefore they look more old-fashioned than the second hand market desires. Kip wants to earn some money in the very large second hand market as well, so they take back the caravans, restyle them for the younger people, and resell them again.	Kip	Ps	consumer							*	*										
Lease of computer parts		MVE	Ps	both							*	*										
Leasing of liquid bulk containers, chassis, tractors and trailers		Integral	Ps	business-to-business							*	*										

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International Aviation Partners	IAP is an intermediate company for buying and leasing aeroplanes. They collect lessors and lessees of aircrafts, and make the two companies contact. They are lessors of some planes as well.	International Aviation Partners	Ps	business-to-business							*	*										
Art lease		Art Lease BV, Utrecht	Ps	consumer							*	*										
Leasing washing machines and dryers for students		Splash lease	Ps	consumer							*	*										
Computer leasing	Computers can be leased for short periods of time from producers. The minimum time found was 15 minutes (Kinko's chain)	Mahé Assurantiegroep B.V. Digital Linotype-hell AG DST Logistics Relectronic -Remech	Ps	both							*	*										

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Yacht leasing			Ps	consumer							*	*											
Reverse logistics of EPS packaging	EPS packaging can be returned to the producers by a communal takeback service.	Stybenex	Ps	business-to-business																*		*	
Refilling of copier and printer cartridges	Specialised companies buy empty cartridges and sell refilled ones.	Ecotone	Ps	both																*			
Ready made meals 'out of the wall'	To compete with fast-food restaurants some supermarkets even have the possibility to sell ready made meals not only when the store is opened, but even when it's closed by selling it 'out of the wall'.	Albert Heijn	Ss	consumer				*															
Digital camera without a local storage medium	In the near future it will be possible not only to take pictures digitally, but send them directly to your hard disk by using a transmitter. The pictures will be received by a service connected with the internet, that sends them directly to your hard drive.		STC H	both																			

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Renewing of office-buildings	To prevent the giant amounts of waste caused by old office-buildings that are demolished down and being replaced by new ones, the National Audubon Society renovates old buildings in such a way as to save on building materials, use of energy etc.	National Audubon Society, New York	Ps	business-to-business												*	*		*	*		
Electronic trade of used trucks	Customers who want to buy a used Mercedes-Benz truck, are informed about the cars available by an online trade system. Because this system is easier to use than traditional ways of trading second hand trucks, companies will earlier buy a used truck. The period of use is lengthened in this way.	Mercedes-Benz AG, Stuttgart	Ps	business-to-business						*												
Reuse of truck-parts	When new trucks are distributed, old trucks can be collected. These old trucks can be dismantled so re-usable parts can be obtained. These parts are being sold on local markets, so not much energy is used for distribution as well.	S.A.W.E.G. AG, Altdorf	Ps	business-to-business													*		*	*		
Maintenance service sells functioning hours	In stead of paying for the maintenance services done, Swissair pays per hour the aeroplane is flying. In this way the maintenance service is stimulated in doing their work efficiently, as well in doing it in a proper way. Swissair buys functionality.	Motorenwerkstatt der Swissair AG, CH-8 58 Zürich-Flughafen	Ss	business-to-business																		

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Longlife motor-oil with motor quality check	Mobil Oil AG in Germany has developed a synthetic motor oil that functions longer than traditional mineral oils (4, km in stead of 5, *, km). To make the same profits as with traditional oils Mobil has added a service to the oil-change: They analyse the old oil on fragments of the motor. With this information it is possible to conclude whether the motor is in good shape or should be revised. Mobil also takes responsibility for those conclusions. Because less oil is used, and because experts should change it, the chemical waste is less and collected centrally.	Mobil Oil AG Germany	Ps	both							*							*	*				
Camper Share	Owning a camper is very expensive. Considering the short period it is being used each year the organisation 'CamperShare' set-up a system to share a camper with more families. The organisation takes care of the regulations (like insurance, taxes, liability etc.). In this way campers are available to more people, but can be used more efficiently.	CamperShare	Ps	consumer							*			*									
Suit in the right size	Buying a new suit can take a lot of time. Especially to those people who have a lack of time, Bijenkorf set up a service for their customers. Once they communicated their specific wishes and size, Bijenkorf searches the collection and makes a selection. In this way Shopping can be done more efficiently then it was.	de Bijenkorf Rotterdam	Ps	consumer				*															
The Electrolux Eldek system	Because cleaning quilts is a job that can't be done in an ordinary washing machine, it is usually done in a washery. To have one clean bed, about 5 quilts are needed. The time between the moment a quilt should be washed and the moment it is returned is that long. That's why Electrolux set up a system together with a producer of quilts to make it possible for institutions to wash the quilts themselves. The complete system of quilts, detergents and washing machines is leased in one contract.	Electrolux	Ps	business-to-business					*		*	*											

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Microfix computer hardware repair service	Having a piece of hardware repaired is most times more expensive than just buying a new one. Microfix tries to do a better job than most manufacturers do. They pickup the defect equipment, repair it and deliver it back again. Microfix even guaranties the proper functioning of the device for a certain period.	Microfix B.V.	Ps	business-to-business													*					
Subscription to a meat package	After the introduction and implementation of the subscription to vegetables, it is possible as well to subscribe to a weekly made meat package: BOEUF. The animals are grown in a biological and ecological way, approved by SKAL by means of an EKO quality mark. Overproduction is prevented in this way. Also butchereries are controlled on their processes.	Boeuf	Ps	consumer		*	*	*			*											
Take back service for PVC	Many industrial curtains and screens contain or are made out of PVC. Incinerating this plastic after disposal generates toxic waste. Reusing or recycling therefore is a better way. VLP, Naaldwijk in the Netherlands considers the possibility of taking back those industrial curtains and screens, so that it can be recycled in flagstones or other products.	VLP, Naaldwijk	Ps	business-to-business															*			*
EMS Techno-Koerier	The EMS courier service is extended with a Techno courier service. With this service, couriers do not only deliver computer components, but also install components or repair the computer. EMS had couriers trained specially for this service. Laser Computers uses the EMS Techno Courier as an extra marketing instrument. Hewlett Packard uses this service in big, time limited projects.	EMS Laser Computers Hewlett Packard	Ps	business-to-business		*	*	*														
Library at home	Some people are not able to visit a public library. It concerns old or ill people and disabled. So an extra service is added. In this service library books are delivered at home. A library employee, together with the customer chooses books and audio-visual materials. A volunteer delivers and picks up these materials after 4 to 6 weeks.	Public library Delft	Ss	consumer																		

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Value-added assembly of computers and copiers	Computers can be assembled, not only by the producer or specialised retailer, but also by the distributor. This means that just-in-time delivery is combined with mass customisation. In this case the distributor adds value to product he transports. The same is done for copiers.	Scansped/I CL for computers Cannon and Ricoh for copiers	Ps	both		*	*	*															
Starting a laundrette	Electrolux supports initiators who want to start a laundrette. Together a business plan is made, market research is carried out, a location is found, a permit acquired, etc. If needed Electrolux has a lease construction for initiators without high investment possibilities. A same kind of support is offered in dry-cleaning, kitchen equipment etc. If needed, also training can be given.	Electrolux: Splash Leiden	Ps	business-to-business				*	*			*				*	*					*	
Clear drinking water in every office	EauVital supplies offices with a system that contains pure crystal low sodium water. The water is for drinking cold. EauVital supplies the watercooler that works as a dispenser, bottles of water and drinking cups.	EauVital	Ps	business-to-business				*		*	*												
Fastfax	Companies use faxes more and more as a way of direct marketing. Fastfax offers companies to do this for others. In this way, more efficient faxes are sent. Whenever potential clients do not appreciate this kind of marketing, they can automatically block all fax.	Fastfax, work together with many companies. Examples: EauVital, KPN postal services	Ss					*															

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Integrated pest management	Several pesticide manufacturers promote integrated pest control to diminish the use of pesticides. By molecular engineering, pesticides are more specific and less pesticides are needed. Sometimes plants are re-engineered so they withstand diseases. Next to this farmers are given information on efficient and effective use.	Monsanto Company Zeneca	P/S	business-to-business		*					*												
Providing dishes	In 1993, Bibo Company of Settimo Torinese shifted from producing and selling mono-use plastic dishes to provision of a service for collective and public restoration services. It consists of taking back and recycling of plastic dishes. The company retains the ownership of the products. Due to the new business, Bibo redesigned their products.	Bibo Company, Italy	Ps	business-to-business							*											*	
Refractories renting	An English company supplier of engineering materials rents the refractory furnace liners to steel companies. In this way steel companies avoid refractory disposal and stocking. This means an intensification of use of refractory furnace liners on one side and an improving of recovering and reusing practices saving inputs materials.	Cookson Group PLC	Ps	business-to-business									*								*		
Renting of cleaning products	Electrolux Euroclean AB (professional appliances) promotes its renting service for cleaning equipment. The service includes consultation and suggestions on the choice of machines and cleaning methods, training programs on optimal use, maintenance and repair service. Customers (professional cleaning companies) pay a monthly fee.	Electrolux Euroclean AB	Ps	business-to-business				*	*				*			*	*			*			

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Supplying colours	Companies that used to sell dyes and pigments are starting to become suppliers of colours to its customers. These customers are merely other companies. This service is comparable to the paint on demand for private consumers.	Ciba AG Division Pigment Continental - Lack- und Farbenwerke	Ps	business-to-business		*				*													
Sofa lease	As the next step after refurbishment, Leolux is examining the possibilities of sofa lease. Together with a retailer and a consultant it was already found out that the environmental performance can drastically be improved when customers bring back their sofa after a few years for refurbishment, or for re-use of parts. If customers want to lease a sofa is still unknown.	Leolox, Venlo Eijerkamp, Zutphen CEA	Ps	consumer							*						*			*			
Executive Jet: time sharing of planes	2 % of planes sold to business users (not aircraft companies) are sold to a group of users. Most of these companies did not own a plane before. Some resistance arose from the purchase department of big companies, since their felt their task threatened. Since summer 1998, Executive Jet is active on the European market.	Executive Jet, got financial support from Warren Buffett	Ps	business-to-business										*									
Leasing of disabled needs	The former state department GMD (Gemeenschappelijk Medische Dienst, Common Medical service) was turned over into a private company ZVN (Zorgvoorziening Nederland, Dutch Care Provision). They supply 35 to 4 % of the wheelchairs to municipalities. The big leap forward came with the purchase of a retailer for medical supplies: Welzorg. Due to this structure, the recycling of wheelchairs increased from 1 to 5 %. This saved 15 million Dutch guilders per year.	ZVN (Zorgvoorziening Nederland)	Ps	business-to-business			*					*											*

Product Service System	Description	Companies	Type	Target group	Design	Production	Distribution	Sale	Installation	Result	Use							Repair	Maintenance		Function extension	End-of-life				Treatment	Re-cycle		
Stylehouse pre-order	Malaysian airlines offer an interactive shop on their flights. While in the air, you can order designer accessories (chain sets, earrings, flower pins, handbags etc). These items are delivered on the conveyer belt together with the luggage. Also flowers can be ordered. These are delivered to the addressed person.	Malaysian airlines, co-operation with Interflora	Ps	both			*	*																					
Painter instead of paint seller	DuPont paints cars for ford, instead of being a supplier of paint. In this way, DuPont takes the responsibility for the paint on the cars. DuPont is stimulated to use as little paint as possible, stimulating new technologies.	DuPont and Ford	Ps	business-to-business					*																				
E-commerce from IBM	IBM offers e-commerce, hereby extending their business from producing hardware to functions offered by computers. In this way revenues are generated also after the point of sale of the computers.	IBM		both							*																		
Tap water in bottles	A drinking water company near the Dutch city of Tilburg has started selling tap water in 1 and 1,5 little bottles. No extra handling is done. The water, although having the same quality, is sold for almost 1 guilder per litre instead of, 1 guilder. A service of bottling is added to the product water.		Ps	consumer		*	*	*			*																		

Questionnaire

Instruction to the questionnaire

In the economical and environmental analysis is to compare the product service system to competitive products or services. To do so, you need to describe the exact functionality of the product service system and the alternative system. Only alternatives sharing the same functionality can be compared. For that reason we formulated some questions on fulfilment of function.

Anything a product or service does to benefit the consumer is what we consider to be the function. This can be the objective and measurable performance, but can also contain subjective elements. For example: the stringent function of a car is transport of people. Besides, a car is also a status symbol. People consider the functionality of a product in a different way. To some people the image 'provided' by the car is less important than it is to others. It is even imaginable that to some people not owning a car provides a desired status. So first we ask your opinion on the objective and non-objective function fulfilment by your product service system.

General questions

1. Can you give a description of your product service system?
2. By combining a product and service the function of the separate service and product is enlarged. What are, to your opinion, the functions of the product service system to the user?
3. Which functions are changed or added, disappeared compared to an old product or service?
4. Can you give an indication on the financial appreciation of the product and service component by your customers?

all valuation to physical product

all valuation to service

5. How (with which products, services or other PS system) can the function also be fulfilled?

Do these alternatives fulfil really all functions your product service system fulfils?

Which functions are, which aren't?

6. Can you give a description of a reference system?

Environment

1. Which are, to your opinion, the main positive and negative environmental effects of your product service system?
2. Is your product service system environmentally better, compared to the reference situation?

much better

much worse

3. Can you give a short description of the manufacturing and service providing process of your company? Please sketch the process in a flow diagram for clarity.

For each 1000 kg of product, please list the amounts of raw materials that are needed. This does not include packaging for the finished product that leaves your company. As generally some amount of waste is generated, totals can be over 1000 kg. (Please use generic names rather than trade names and give a short description of the use (e.g. talcum 99%, 100 kg, filler or NaOH, 10 % solution, pH stabiliser).

Can you state the country of origin of each of the above mentioned materials, the method of transport and type and weight of packaging per unit. (E.g. 50 kg PS granulate from Germany, truck, in HPPE bag of 500 grams).

What types of energy and which mobility are used in your production process: electricity, steam, gas/oil/wood-fired furnace, petrol.

For each 1000 kg of final product, please list the amounts and type of emissions to water and air that might occur in the production process if this is known. If only concentrations in waste water/air are known please state these and give the amount of wastewater produced per 1000 kg product.

For each 1000 kg of final product, please list the amounts and type of waste that are generated. Please indicate whether the waste is recycled/incinerated on site or disposed of in a controlled landfill or communal incineration unit.

Economical analysis

To make an economical analysis we need some information on your product service system. In answering these questions, you are asked to use attached tables.

1. In table 1 (producer) we ask you to give costs and revenues of the project of the development of the product service system. In the table you find a column costs, and a column revenues. You can choose to give costs and benefits per time period (financial year, period of the project, etc.) or per unit products or services. We divide these costs according to the different stages the product or service lives through. The terms per life stage are point of interest to you. We are only interested in totals per lifestage. We are just interested in rough indications, not in exact data.
2. In the second column (change of costs) we ask you the change in relation to the reference system.
3. In the fourth column (change of revenues) we ask you the change in relation to the reference system.
4. We expect you carried out a cost assessment in advance. We are interested on which basis you decided to start your product service system.
5. What time horizon did you take, and why?

1 year / 3 year / 5 year / 10 year / period of the project / different ...

How did you choose the time horizon?

Which risks do you considered?

6. What was the expected Return on Investment?
7. Due to the product service system the financial situation of suppliers and customers has changed most probably. In table 2 (suppliers) we ask you to indicate the turnover of products, materials and support purchased by you. You can again choose to give this turnover per time period (financial year, period of the project, etc.) or per unit products or services. You can confine yourself to the most relevant suppliers; those who are responsible for 80% of the costs.
8. In table 3 (consumers) we ask you to indicate the change of costs to the customer. You can fill in the costs of the product service system and the costs of the reference situation. In the third column you are asked to indicate the changes.

Product service system as a new activity

To you as a company introducing the product service system was a new activity. We are interested in the reasons why you did so, how it fits in your business strategy and the corporate identity.

1. Why did you start this product service system? Several options are possible.
 - Portfolio development
 - Market development
 - Product development
 - Enlargement of turn-over
 - Other, ...

2. Was your organisation able to provide this product service system?

3. Did the organisation structure change?

4. Did the authorisations change?

5. Were personal abilities, knowledge and attitudes adequate?
 - adequate
 - needed a lot of adaptation

6. Was your innovation method adequate to develop and improve the product service system?
 - adequate
 - not adequate

7. Did the customers and environment accept the product service system?

8. Did you meet resistance from players within the production chain?
 - little
 - a lot from

9. Did you form alliances?

10. Were players within the chain passed by or eliminated?

11. To what extent did the market accept the product service system? (user's characters, geographical difference, etc.)
 - wide acceptance
 - rejection

 - Those who accepted were:
 - Those who rejected were:

12. Did normalising institutes (legislator, normalisation institutes) hamper the introduction?

13. Did interest groups (non-direct actors in the chain) influence the introduction?

14. Which strategy was used by each of these interest groups?

15. Did you meet main legal obstacles?
 - Product responsibility
 - Ownership
 - Non tangible products
 - International conventions
 - Privacy protection
 - Co-operation
 - Intellectual property
 - Different, ...

Customer acceptance

Preceding the market introduction, it is needed to make an inventory of (potential) customers and to inform them about the product service system.

1. What kind of market research did you carry out?

2. Which aspects of the product service system did potential customers consider important? Several arguments are possible.
 - financial benefit on short term
 - financial benefit on the long term
 - more comfort
 - status
 - fitting to attitudes and values of the customer
 - reduction of complexity
 - different,

3. How did you launch the product service system?
 - wide propaganda towards a big potential clientele
 - direct approach of existing clientele
 - direct approach of relations of existing clientele
 - personal contacts between you and potential customers
 - different,

Final question

Is the product service system a success? Why or why not? Please just mention one reason.

Yes, because

No, because