

DESIGNING RELATIONSHIPS

CECI N'EST PAS UN PRODUIT

As we move from mass-produced, one-size-fits-all products to personalised, adaptive, and evolving Product Service Systems, the design deliverables take on other forms. In this section, we look at 'what comes out of the box when the user unpacks what they paid for', and reflect on the new results that design should bring.

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A PRODUCT IS MORE

THAN A PRODUCT

A brief for a product-service system differs greatly from the traditional design brief for a ‘four-legged chair with armrests’ that you buy, take home, and use. In many ways, designing a PSS is like enabling evolving relationships. Based on the learnings from the CRISP projects, we have noted four factors that play a key role in enabling these relationships:

MORE TIME

The use of most chairs is quite straightforward, sitting on them is most often thought of as a single, timeless action. On the other hand, a relationship often starts with a first date, after which more encounters happen, either brief or long. And, as your perceptions may change, you experience them differently over time.

The Skewiel bus service that was designed as part of Grey-but-Mobile delivers its value through the interactions between the elderly and the driver that extend over a longer time span. Unlike the chair, a single photo of the bus, or the interface through which the service can be booked, such a single picture tells you very little about how people will actually use the service, and how they experience the benefits over time.



These two pictures tell very little how the relationship between volunteer driver Frits, his Skewiel Mobil and Gerwin Sjollema developed over time. The companionship, the assistance and the chit-chat on their weekly Thursday drives has so much more value than a product-service system that improves the mobility of elderly people.

MORE GROWTH

Once bought, the chair is yours to keep and maintain. Typically, it will remain the same. In a relationship, your next encounter will not be the same as the first date. If the relationship doesn't evolve over time, you will probably experience that as a bad thing. Someone's first trial of the bus service may only be focused on getting from A to B. On repeated trips, the traveller may learn that not only are drivers kind enough to help you enter and exit the bus, they are also good company during the trip — open for a chat and a laugh, and happy to exchange tips on interesting things happening in town over the weekend. This social element may prompt you to recommend the service to your friends, and may impel the service provider to extend the service to better support this social element.

MORE PEOPLE

When you buy a chair, you can sit on it, or let your guests sit on it. When you enter into a long-term relationship, it affects your other relationships, e.g., your family. You don't typically introduce a chair to your parents.

Designers have been looking beyond 'the thing' for quite some time. Interaction design and experience design place the activities and emotions of the user on centre stage, repositioning the products as props to support the action. However, most work has remained focused on the individual user, how they 'pushed the buttons on the machine' and reacted to the roller-coaster ride that they received in return. We must now, repeatedly, not just consider the primary user, but the people that are part of the service provided e.g., front-office workers, back-office workers, but also family, friends, and further social network. Without those others, the product element of the PSS would be a very limited thing indeed.



MORE FRAMING

For the user, the chair is good for sitting in, and unless they're really into chairs as such, that's pretty much it. But for someone in a relationship, their perspective evolves with the experiences in the relationship. Being in a relationship affects how you think about friendship, about care, trust, and the implications of breaking up. One challenge is to design a PSS so that it 'survives' its initial and often limited encounter. Another is how to design, or frame, what it can be, if it needs time to evolve? The extensions described here don't come on their own. The measure of success of a PSS is often defined beyond the product. Is the bus service a success when the user can book a trip without error and manages to get from A to B? Or when it triggers the desired behaviour by the co-travellers? Or when it enables a more sustained social exchange between the elderly and their helpers? Or when this behaviour change is also beneficial to others passengers in the bus? Increasingly, the latter is the object of PSS design.

Now, is this new? Haven't we seen this all before? Wasn't it in the 60s that we said the design brief is 'get me something to sit on' instead of 'give me a four-legged chair with back support and no armrests'? Yes, and no.

NO MORE CHAIRS

Yes — the designer of a good office chair considers how long the worker has to sit on it; graceful aging has occasionally been considered in fashion, architecture, and product design; the impact of a throne on bystanders is a major design criterion; and marital beds have been designed to promote a happy relationship rather than merely enabling comatose sleep.

But, emphatically, NO — these things did not receive attention as systematically as they should have, because PSS design tends to turn things that are quite well-accepted upside down. Deep in our hearts, we often still consider functionality as primary and experience as a desired, but rather secondary, symbolic outcome. But with PSS design, the experience or user journey becomes the major outcome. In other words, functionality is defined in terms of experience. These constructs can no longer be seen separately. In the bus service example, it is just as much about not feeling alone or struggling to cope, as it is about getting from A to B. Other PSSs can be about feeling close to a loved one, rather than about just having a new smartphone. Or they can be about having a nice Kaffeeklatsch, rather than the latest Vitra craze. Or, they may be about the meaning of things to me in my daily life, rather than about impressing neighbours, being cool, and endless consumption. It's about well-being and not just welfare. The real value of a PSS is in its use. If it is not used, it hardly has any value, which is different from products. In PSS design, we don't design chairs anymore: we design and enable relationships.

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EMBRACING COMPLEXITY

Knowing what "more people" should be included, and then being able to include them in the process, adds to the complexity of PSS design.



MORE TIME

JUST SIT ON IT

Today we think of interaction as a journey, not a moment in time. The glorified object presented on a white background has been replaced by blueprints of entire customer journeys and their possible ramifications, forcing us to pay attention to the times in-between the touchpoints: the anticipation, preparation, memories, and repeat helpings.

The insight of the longer timeline emerged from the GRIP relaxation space. At first, the designers had focused on the experience of relaxation in itself, i.e., the experience when the user is in the relaxation space. Gradually, it became clear that the location and time that the service was offered, the place of the space in the building, and the social organisation of work there were essential in defining and optimising its offering. The 'before' and 'after' became an essential part of the relaxation space concept.

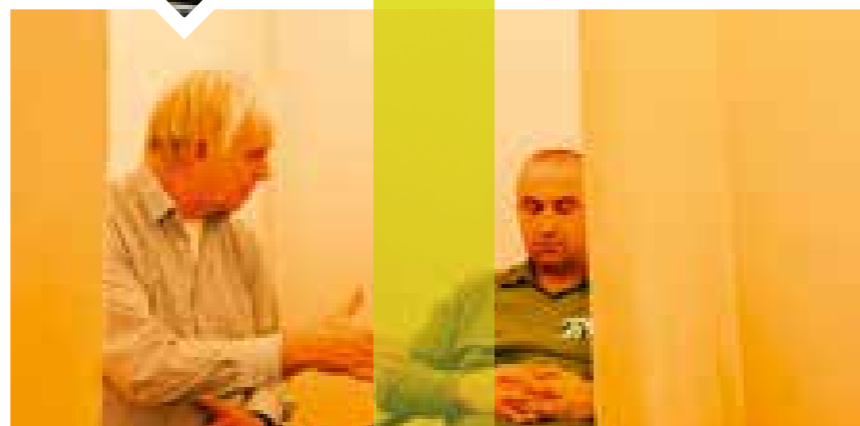
Many services come in the form of a subscription, a soft lock-in of the customer into a stable relationship with the provider, by means of a loyalty to a service or a brand. This lock-in has become an explicit criterion for success for the design brief.

The importance of stable, repeated use became apparent in G-Motiv; the Wuppermann factory now has displays installed that continuously visualise the workers' role in what was being made. The goal here was to create an awareness and social attitude of being involved in and responsible for the production. Whereas the facts could be recognised immediately, the changes in attitude and behaviour only become apparent after prolonged use of the tool.



The location and time that the GRIP relaxation service was offered, the place in the building of the GGZE and the social organisation of their work were essential in defining and optimising its offering for employees and clients. The 'before' and 'after' became an essential part of the relaxation space concept.

Product design has a tradition of products on plain white backgrounds. With a PSS, this does not help the viewer to understand what the PSS is or has to offer. The essence of the offering is no longer a static thing, and it grows through usage. Time-spans enter the framework at different levels, from journeys of individual customers to the evolution of the service after its initial release.



MORE GROWTH

IT'S ALIVE!

Services and PSSs come in iterations and versions

In G-Motiv's ActiveCues table, the users at Careyn who participated in co-creation got to use the tool first. As such, they proved its viability, so that potential business partners could witness what they'd buy into before the service was released to a larger target group.

The robot-care project Selemca found that users needed time to become familiar with a PSS and that its potential is only realised after hands-on experience. This leads to improvements and additional functionality to be addressed in new versions of the design. Johan Hoorn: "Ideally, some kind of 'optimiser-designer' should keep track of these progressive user insights, and thus be embedded in the PSS. The provider could offer this as a unique selling point, or comparably, as a service contract: an optimisation contract."

For the relaxation space developed in the GRIP project, each prototype was a further step in the transfer of the PSS from designers to other stakeholders. The first relaxation space was developed internally at Philips, allowing the company to use the functionality at its own discretion; later prototypes facilitated further research and development by GGZE and were designed to attract additional partners interested in the design of tools to make the space

more interactive. Dirk Snelders: "Because so many interdependent parties are involved in its continuous development, there might be a feeling that PSS design is 'unfinished business'."

Unlike products, PSSs evolve over time. A product life cycle can be separated into clearly defined sequential milestones (e.g., design, production, introduction, purchase, use, disposal), and the 'design' was finished on completion of the production. A PSS, however, follows a more organic growth path: PSS prototypes might be placed on the market as beta versions, production of service elements takes place during use, and upgraded versions don't require purchase or disposal. That means that the design phase doesn't end with the release, or, to phrase it in software terms, the service can stay 'forever-beta'. The line between development and use has become blurred. This requires new insights into how to decide whether the design of a PSS is 'finished', or good enough to be 'let go'. The time scope of design has substantially broadened, which raises the question: how can we anticipate and manage the further development of the PSS after this moment?



MORE PEOPLE

*TWO'S
COMPANY,
THREE'S
A CROWD,
MORE IS
A SOCIAL
NETWORK*

When you enter into a relationship with another person, you soon realise that they come with their own ties to people and things. You cannot get away from the fact that you need to consider and involve the other's friends, parents, colleagues, or car, house and other things.

The two CRISP projects 'Grey-but-Mobile' and 'Smart Textile Services' illustrate the relevance of these multiple relations and how they are dynamic, conditional, and heterogeneous.

More people in the picture

When Martijn ten Bhömer designed a smart textile product to stimulate physical activity in the elderly and users suffering from severe dementia, he soon realised that more people were involved than just the patient. The first prototype, an interactive blanket, had to be used together with the physiotherapist, as part of the physical therapy. When the project moved on to implementation and testing of the prototype, family members also were involved. First they had to give consent, but their role quickly changed when the husband, for example, used the blanket to communicate with his partner. The second prototype, Tactile Dialogues, was designed to stimulate this communicational aspect through interactive tactile features. In the evaluation, it became apparent that the real empowerment came for family members and carers visiting the patient. Often such visits come with awkward feelings, due to the alienation of patients with severe dementia from their partner, children, and other carers. By tailoring and personalisation, and trying and testing, these groups could better deal with this situation.

Family members appreciated this opportunity to personalise the behaviour to fit to the specific conditions of the visit, for example, setting it to react to touch more quickly, more slowly, or more playfully.

In the case of Grey-but-Mobile, the elderly travellers expressed what they valued in the implementation of the service. It wasn't that they were brought from A to B by an electric vehicle. The real value was that their driver stayed with them, walked them to the shop, and helped with carrying the groceries. These drivers were all volunteers, recently retired, and drove the elderly around without any financial compensation. In roundtable talks, they explained how relevant and useful they felt, trying to make a difference to the lives of the elderly people in their community.

From solving a problem to exploring, establishing, and maintaining relationships

On first impression, both designs seem to focus on solving problems, i.e., the difficult communication with dementia patients in the Tactile Dialogues project of Martijn ten Bhömer, or the limited mobility of elderly people in the Skewiel Mوبiel project of Grey-but-Mobile. Both design teams, however, would now argue that designing a PSS is about more than solving a problem. The focus of the project is on establishing an infrastructure that services social activities, through which relationships are explored, established, and maintained. It turned from solving typical problems of dementia or mobility into creating more opportunities for social exchange and feelings of closeness.

*BUYING A
PSS IS MORE
LIKE BUYING
A PET THAN
BUYING A THING*

As an extension to the PSS of Tactile Dialogues, an additional social activity was introduced where family members and professional carers analysed the video after the visits. In these sessions, the professional could point to specific details in the interaction, revealing to the husband that his interaction through Tactile Dialogues indeed triggered an emotional response from his wife. These sessions not only inform family members about dementia in general, but also make clear the specific condition their loved ones are in. The combination of visits with Tactile Dialogues and the review of those visits through video with the professional help family members to establish communication in the lost relationship with their spouse or parent.

CASD researcher Ana Valencia reached similar conclusions on the importance of social relationships when designing a PSS. Through interviews with designers and users and several smart-PSS case studies, Ana identified seven key characteristics that designers should take into account for designing smart-PSS — but also PSS in general — that can deliver meaningful user experiences. For instance, Ana found that designers should think about the extent to which a smart-PSS should offer an individual experience or a shared one (or both, like in the gaming industry). And in relation to that, designers should consider to what extent a smart PSS should create a community feeling among its users and stimulate long lasting relationships that go beyond the smart-PSS usage moments.

In Skewiel Mobiel, more was needed than an electric vehicle and a driver to solve the mobility problem of elderly people. Discounts were offered with local shops in the community to “lure” users into trying out the system. Volunteers were acquired through mouth-to-mouth, locally distributed leaflets, and through the network of the service provider. The elderly users developed relations with the receptionist who booked

the services. He knew the clients and their preferences. Because of the rather fixed weekly routines of both clients and drivers, similar people saw each other quite often. This helped in shaping more tailored services between drivers, clients, and the local community.

These insights about the involvement and value of indirect users only came about when the PSS was implemented and further evaluated. None of these insights could have come from brainstorm sessions, stakeholder analysis or imagined customer scenarios alone. For PSSs to realise their full potential, they need to be implemented, and then nurtured and allowed to further evolve.

How complete must the implementation of a PSS be to enable unknown effects to be known?

DESIGNING A PSS IS MORE THAN SOLVING A PROBLEM FOR THE END-USER. A PSS CREATES OPPORTUNITIES FOR SOCIAL EXCHANGE



WITH FAMILY MEMBERS

Tactile Dialogues was designed to stimulate physical activity through interactive tactile features. In its evaluation, it became apparent that the real empowerment came for family members and caregivers being able to communicate again with the person suffering from dementia.



WITH PHYSIOTHERAPIST

Together with the physiotherapist, the blanket's behaviour can be personalised to suit the specific conditions for the visit, for example, by setting the interactive vibro-tactile features to react to touch more quickly, more pleasantly, or more playfully.



WITH HUSBAND AND WIFE

Husband and wife communicate through Tactile Dialogues to re-establish their lost relationship.



WITH PROFESSIONAL CARER

The PSS of Tactile Dialogues has an additional social activity where family members and professional caregivers analyse the video after the visits. In these sessions, the professionals point to the little, yet important details that reveal to the husband that his interaction through Tactile Dialogues did trigger an emotional response with his wife.

MORE FRAMING

TAKE A BROADER VIEW ON THIS

So, if a PSS has multiple forms of manifestation, evolves over time, and relies on the various people involved in it, how then should we communicate what it is, and what it has to offer?

To convey these aspects, a PSS requires an expressive language; one of PSS design's key challenges is to establish new frames for this. In addition, PSS design often means taking different perspectives on what is offered to whom. This means that PSS design also needs to communicate the consequences of multiple parallel frames.

In the case of G-Motiv, it's tempting to present the game as the result. But what has really been designed is the impact of the game, or, as Valentijn Visch puts it: "The result of a PSS is what we call the 'transfer effect': this can be anything from an awareness about something to a behaviour change, a more intense social relation or an information exchange. A game is a means, a tool to achieve this effect. By means of gamification, we change the experiences of the user, and this in turn should change the user in some way, for example their attitude or, compliance." Change is the objective of the PSS design, the game forms only a potential means — one among many.

Telling the story

Ideally, a PSS's representation should address both means and desired outcome, while at the same time showing interaction over time and the roles of the various people involved. This may sound ambitious and in conflict with the intended clarity of the message. However, if a white-background catalogue picture is worth a thousand words, a simple cartoon-like scenario board can often multiply the explanatory power, creating a narrative by introducing time. Blueprints can also be valuable, as they allow for additional layers: interaction schemes, stakeholder roles, front-office and back-office organisation, etc. Eloquence further increases when using video as a medium: a makeshift movie clip can do its own talking. In Smart Textile Services, video was often used to communicate the different stories or values of the Product Service System, as well as to explain the actual workings of its different components.

No matter what exact format is used: time, context, and outcome are essential. Put a PSS on a pedestal and these disappear.

Creating new categories

Compared to products alone, PSSs have a wider range of opportunities when it comes to fulfilling needs. As a consequence, the solution they provide might be hard to classify: it often doesn't fit existing categories. Careful positioning of the envisaged result is needed to manage expectations, inspire stakeholders with a proposition, and establish its future relevance. Early on in the Selemca project, the team struggled to grasp and communicate the potential usages and benefits of their new care robot. The confused responses from their initial audience of potential stakeholders taught them that they needed to position and further develop the care service around the robot in a real-life context. In so doing, they were able to craft the service concept in a more meaningful way. Framing a PSS in a social embedding turned out to be a critical success factor. If this is not there, it can be an innovation killer. The team then organised 'design for a dilemma' sessions that helped stakeholders to empathise with perspectives on care that differed from their own. In this way, they were able to overcome stereotypes about robots that constrained the initial acceptance of the PSS. This later stage of the project drew a great deal of media attention — and even resulted in a documentary, 'Alice cares', that featured in the Rotterdam Film Festival.

Visualising the intangible

Interaction, experience, behaviour: a large part of a PSS consists of intangible elements. Surprisingly, physical products still play an important role in conveying and shaping these elements. The way we behave, interact, think, and feel while doing something is not independent of the things involved. Even when the result is intangible, its development often

requires tangible means. These artefacts, including sketches and early prototypes, enable conversations about the core idea of the PSS and how it could be implemented. In a later phase, deliberately designed boundary objects can help introduce the proposition to a larger audience. When Océ – A Canon Company opened up their new elevated printing technology to designers, they found it was not very helpful to just give out tooling and the corresponding instruction manual. The tools and instructions apparently did not trigger the imagination of what would be possible with this new technology. In PSS101, Karianne Rygh created a broad range of elevated printed samples to explore and convey the opportunity space to designers and others. This succeeded in triggering people's attention, and enabled participants to build on these samples with their own imagination.

THE EVOLUTION OF CHANCE IS THE OBJECTIVE OF PSS DESIGN

Anticipating the potential

An additional challenge is how to frame or express the evolving nature of a PSS. It can be extremely difficult, especially at an early stage of the design process, to show the potential results of what a PSS could become in the future. Within PSS 101, the Networked Collaboration Canvas was developed to connect the variety of activities and the stakeholders involved in a PSS project design in order to improve their collaboration. Recalibrating these connections during the design process turned out to be an important activity, enabling stakeholders to reflect and anticipate on their actions and the corresponding impact on the networked collaboration. A PSS typically follows an organic growth path. Stakeholder feedback is integrated as the PSS is gradually scaled up. Improved versions are released, with ever wider audiences. Ingrid Mulder from PSS 101 likes to call this the "ripple effect", it bridges the gap from the lab to the market. Users who have been involved from the start will be the first to recognise the potential of the PSS. Their evolving insights can then be used to better express the characteristics and future value of the PSS to a wider group of people.

So... how broad should we go?.

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If there's someone who has consistently led design discourse, it is Don Norman. In the '80s, he applied cognitive science to designing computers people could understand and use; in the '90s, he drew attention back to physical products; in the '00s, he advocated aesthetic and emotional qualities; and now, in the '10s, he is moving toward socio-technical systems. Who better to comment on the current developments with PSSs?

EVEN SIMPLE THINGS CAN BECOME COMPLEX SOCIOTECHNICAL SYSTEMS

A PRODUCT IS MORE THAN A PRODUCT

Don Norman

Today, designers think of systems, of services, and of lasting relationships. Design has moved on from things like chairs and simple systems to larger more important stuff, working to improve things like those massive, complex, bureaucratic systems that seem suited for no one. It's time for a manifesto!

Hey—we have one. *DesignX* we called it, put together by a band of kindred souls from Delft, San Diego, Shanghai, and Swinburne. *DesignX* aims at relationships that might have hundreds or even thousands of interconnections, relationships that can last a lifetime while simultaneously changing with time. It's a worthy cause.

Chairs are mentioned pretty frequently in this issue, so let's consider the poor, lonely chair, once a staple of a designer's portfolio. Even chairs can take part in *DesignX*, because the 21st century chair might be an active, dynamic device capable of complex relationships.

Imagine how the 21st century chair might perk up when guests arrive, autonomously transforming itself as needed. It can become a stepstool when someone needs to stand on it, or a bed, perhaps formed by enlisting other chairs so that they can support a horizontal body (or two or three). When self-organized into neat orderly rows of its collaborators, the chair can accommodate crowds. While awaiting the crowd's arrival, the chairs are a memory of the future, reminding us of the event that is to come. After they leave, the same chairs serve as a memory of the past.

Modern chairs will be intelligent, anthropomorphic, sensing, dynamic, capable of altering their shape, form, and function. Some chairs might come when called, others might lift people to reach high-up objects, and yet others might socialize with like-minded chairs, forming moving patterns across the room as they travel to wherever they might be most useful. These 21st century chairs are social, aiming to please. They will be active servants, relationship builders, and enablers of social interactions.

In the 21st century, designers will produce many things besides chairs, many of which will not be objects. Some will be services and experiences, such as healthcare and wellness. Some will be ideas. Is an idea a thing, a product, a service? Whatever they are called, they need to be designed, not as isolated things, but as complex, inter-related systems, as total experiences, as relationships.

We design affordances to permit and encourage some activities, anti-affordances to discourage and prevent others. Anti-affordance? Yup, a term I coined for things deliberately designed to prevent an activity, such as barbed wire, or those nasty spikes on the top of fences, or little steel pieces on the edges of walls in public places meant to prevent skateboarders from practicing their grinds and slides along the sides of curbs and railings, preventing those acrobatic, amazing

gravity-defying spins and jumps, where the skateboard miraculously follows the feet as if attached, even though it isn't.

Who was it who designed the skateboard that makes such feats possible? I suspect the capability was discovered, not designed, but once discovered, from then on it was designed with careful attention to the details of the trucks, the curvature of the boards, and their springiness. So successful were the acrobatic behaviors these designs afforded, that a new profession arose: designing against those affordances, designing anti-affordances to prevent the very activity that skateboarders love.

Sometimes it feels as if we, as designers, are fighting a duel, so that while we create marvelous devices capable of great intelligence, relationships, and creative expression, others work feverishly to deny these same characteristics. Creative relationships? Yes, all very good, they seem to say, but please, not in my backyard, nor front yard, nor within visible sight or audible distance.

Anti-affordances are one of the tools of the opposing designers. Imagine a chair designed to prevent sitting. Chairs, some people claim, are bad for health: killer chairs, they are called. Sitting is unhealthy, goes the new mantra: stand when you eat, stand while you work, and in the meantime, just stand. So while one community of dueling designers will create masterful, intelligent, shape-changing dynamic chairs that offer comfortable support, others will introduce anti-affordances to prevent that 'unhealthy' comfort.

Today's designers may create ordinary chairs, but increasingly we will all work on more complex things, some as radical as autonomous shape-forming chairs, but others more prosaic yet even more difficult, things such as healthcare, or the way that automated cars might interact with drivers, passengers, pedestrians, bikers, and skateboarders. Even simple things can become complex sociotechnical systems.

A product is more than a product, it is a relationship that drives multiple relationships.

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