MAPPING BUSINESS MODELS FOR SOCIAL SERVICE DESIGN IN HEALTHCARE

Lianne SIMONSE*, Siets VIs, Evelien GRIFFIOEN, Laura NINO, Catalina RUIZ, Andrea CROSSLLEY URREGO and Gabriela SOTO CAMACHO

Delft University of Technology

If the question of eHealth is framed in a social context of actors and transactions, new opportunities emerge for designing a business model. We explored the concept of Business model design, with notably and explicitly referring to ‘design’ and conclude that from our perspective the modeling aspect is missing. As strategic designers we have the ability to contribute to the solutions of business models. By using, and adequately adapting business model concepts from corporate strategy we took the lead in designing business models in five experiments in eHealth and built upon our capabilities and invent methods and tools for creating business models in a designerly way. With five case experiments, we open up the black box of the process of designing business models and look at what is actually designed.

Keywords: Business Model Design; Healthcare; Service Design

FRAMING A BUSINESS MODEL DESIGN GAP

New social contexts, designers and business model designs

Social roles of industries are transforming from the economics of merely product production to providing father reaching service solutions that impact social relations. Likewise roles of designers are transforming and new terrains of human experience are explored for creating innovative solutions. New on the design agenda is the value of design in improving the lives of underserved populations (Margolin & Margolin, 2002). To that respect, innovations of new business models for the ‘bottom of the pyramid’ situations, appeal to the ability of strategic designers. Example cases of Garmeen with microcredit services and Unilever with one-serve shampoo portions demonstrate creative thinking in designing propositions with breakthrough economics of manufacturing (Prahalad, 2004). When strategic designers engage in social contexts and find problems that are framed within a network of interactions, strategic designers most likely invent new design-oriented approaches to cope in the new situation. Most notably, design agencies as, Frog and IDEO are venturing on the new terrain of business model design. With Frog for example collaborating with UNICEF in an IDEA award winning project that designs a new business model for a community case management service:

* Corresponding author: Industrial Design Engineering Faculty, Department of Product Innovation Management | Landbergstraat 15 | Delft 2628 CE | The Netherlands
e-mail: L.W.L.Simonse@tudelft.nl

Copyright © in each paper on this conference proceedings is the property of the author(s). Permission is granted to reproduce copies of these works for purposes relevant to the above conference, provided that the author(s), source and copyright notice are included on each copy. For other uses, including extended quotation, please contact the author(s).
...to explore this unique solution-space UNICEF and frog brought together public health, mobile health and design constituencies to create an adaptable model for how mobile can best support Community Health Workers as they diagnose, treat and refer the most common killers of children (UNICEF playbook, p. 2).

In this social context of health care delivery for women and children in the rural and underserved areas in Africa, interestingly, frog defines its design contribution by a ‘model’ and deliberately scraps ‘business’ out of ‘business model’ that obviously has more commercial connotations. IDEO created an own Human Centred Design toolkit (2010) as a methodological guide focused on "...hear the needs of constituents in new ways, create innovative solutions to meet these needs, and deliver solutions with financial sustainability in mind".

Building on similar projects as Frog, IDEO first acquired and now provides a new expertise of business design that combine design thinking and traditional corporate strategies. Interestingly, this business design expertise is introduced to familiar industrial context of the designer.

From these examples of practice we argue that strategic product designers are found in a position to work within new social contexts in which they apply design thinking to a social network area of human experience. In accordance with Buchanan (2001), professional strategic designers conceive the design of business models as our field of expertise.

**Designerly modelling of actors and transactions**

In these new social context we make use of our design ability of “finding a balance between the technologically possible (an engineering approach) and the socially desirable (a user-oriented approach)” (Morelli, 2007). As Morelli already noted, new contextual conditions of social service design require a new methodological approach on the basis of which a new toolbox for designers needs to be defined. An acknowledged way of building new design approaches, is by adopting approaches from other fields and adjusting these approaches for designer’s purposes. Like for example, the adoption of ethnographic methods that are transformed into new designerly methods, as for example cultural probes and context mapping (Sleeswijk, 2005).

In this paper we adopt the business model concepts from the strategic management fields and adapt the accompanied analytical approach to a designerly modeling approach. We start from the concept definition of a business model design provided by the strategists Amit & Zott (2001):

A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities, (Amit & Zott, 2001).

For a strategic product designer, first element of interest in this business model concept is ‘depicts’, referring to a visual object of a model. Teece (2009) has pointed out that “the exercise of designing new business models is closer to an art than to a science”. We reviewed the literature covering both streams of strategic management and design in search for a visual object of a business model. We found the quite popular business model canvas (Ostwalder et. al., 2008) for structuring the content elements of a business model with the ‘value proposition’ element at the core of the canvas and the ‘revenue’ element in the bottom line. And we discovered ‘actors maps’ (Schiffer & Hauck, 2010; Morelli, 2007) adopted from social construction studies. An actor map depicts the transactions between actors in a network. A combination of both objects would fit the business model definition. But there we identified a gap in modeling new business model designs.
A second element of interest in the business model concept is ‘structure’. This refers to the activity system’s architecture of a business model. Logically an architecture is designed, and we asked ourselves how is an activity system architecture designed? In searching for answers to this question in the literature we found two types of activity map objects: customer journeys and service blueprints (Stickdon & Schneider, 2010). These designerly tools are used for purposes of respectively customer insight generation and for designing a service. In a customer journeys the activities of an example customers are mapped in interaction with employees and professionals of different organisations. In most cases infographics or photo’s provide the visual elements to illustrate the activities. In a service blueprint a predefined structure is formatted in a template (canvas) of front office and back office activities i.e., the parts of the service system that are visible or invisible to the customers. So far transactions with cash exchange are not mapped in these blue prints but could be added.

The third element of our particular design interest in the business model concept is the ‘transactions designed’. This element, we perceive as the most challenging. We found some inspiration from the innovation management perspective in the book ‘Seizing the white space’ (Johnson, 2008; Johnson, Christensen & Kagermann (2008) relating business model innovation to business opportunities. In this view the content of a business model holds four pillars. The first pillar, the Customer Value Proposition (1) is based on latent consumers need(s). A business model design needs focus on a proposition to deliver value to consumers to meet the latent need. The profit formula (2) behind the value proposition is needed to make the business model viable and profitable. Perceiving and deeply understanding the customer needs and their willingness to pay, and balancing it by adapting the “business architecture, the pricing model and the competitive positioning” (Teece, 2009). The pillars for the business architecture that structure the proposition are the resources (3), including employees and partners and processes (4). The design of these processes need not to be confused with business model process design that is more related to IT systems configurations with detailed flows of activities. Casadesus-Masanell and Ricart (2009) stress that it is important to simplify the representation of the business models into main categories to be able to work with it from a high level perspective; avoiding detailing allows a business model to remain flexible. To this respect the process design of transactions in business models are closer related to value chains and value networks.

Co-design of value models of transactions
As a last element of our interest in the business model concept, we consider ‘creating value’ as very important. Zott & Amit (2010) have provided taxonomy of different types of value creation in business models, including: the novelty business model, lock-in business model, complementarities business model, and efficiency type of business model. These characterizations of business models, classify a design of a business model in an analytical way. It provides a frame of reference. By using this in a creative activity, we as designers will shift it from the logical space of problem analysis to the solution space. From a designers perspective the creation of business models for generating value as a solution for a network problem is the challenge. Creating value in social network contexts in new services cannot be addressed by individual designer capability but often require a broader skill set of knowledge. As experienced in many cases the real experts on a certain topic and those with the most insight for a design challenge are the people in the community or end customers. For understanding and framing the problem of new business models mobilizing the input of knowledge to complex problems of social networks makes sense. A growing number of experiments evidence the benefits of stimulating the creative abilities of local communities to co-design a solution. The new social context is often framed within local networks of actors. These actors can participate directly or indirectly in the design of solutions. The identification
of the actors is critical to explore the context of interests, skills, and (tacit and explicit) knowledge that can be mobilized.

In sum, strategic designers conceive the design of business models as an emerging field of design expertise in which corporate strategy and design thinking are joined. In this paper we adopt Amit & Zott’s business model concepts from the strategic management fields and aim to adapt the accompanied analytical approach to a designerly modeling approach. We framed four elements of the business model concept definition and identified a gap in modeling new business model designs. In exploring this new territories of business model design, with notably and explicitly referring to ‘design’, we as strategic designers explored the concept of business model innovation and conclude from our perspective, attitude and abilities that the modeling aspect is missing. We discovered the actors map as an analytical approach that has the potential for adapting into a designerly modeling approach. And we found related designerly methods of activity maps that have the potential for adjustment to designing transactions. Our central research question is: How to design transactions between actors in a business model objects that creates value in exchange of cash flows. In such a way that the value proposition and profit formula are balanced.

**FRAMING EHEALTH ISSUES**

If the question of eHealth is framed in a social context of actors and transactions, new opportunities emerge for designing a business model by strategic product designers. New social contexts for healthcare services are influenced by important demographic trends. Life expectancy keeps increasing while child birth is decreasing causing an unbalanced population pyramid. This implies a load for the healthcare system where more elderly will require assistance while less people will be financially contributing and less healthcare professionals will be available. It is forecasted that the pyramid will remain uneven at least for the next 20 years (CBS, 2010). An increase of health services for elderly care in general and chronic diseases in particular, is expected.

Due to a change of lifestyles elderly prefer their home above a nursing home institution environment, an important trend, is to move the services to the patient’s home (Koch, 2005). In the Netherlands with traditionally high rates of elderly living in nursing homes this trend is confirmed. Around 7% to 5% of the elderly people over 80 live in nursing homes and around 48% to 37% of the elderly people over 95 live in nursing homes (CBS, 2010). Strategists at hospital and clinics view home healthcare as one of the fastest growing areas of healthcare provision. Driven by management targets to increase efficiency by balancing equity of quality-oriented healthcare with limited financial resources, a solution direction is bringing cares services to the home (Koch, 2005). Overall, due to the increasing interest from individuals in self-managing their health and a preference for aging at home rather than in an institution leads to a shift from in-hospital care services to more advanced home healthcare services.

In parallel developments in information and communication technologies (ICT) have prepared for these social changes. New solutions of eHealth offer possibilities to cope with future trends. The solutions of eHealth evolved from telehealth that was initially defined by:

> ...the use of communications technology to deliver health and healthcare services and information over large and small distances (Picot, 1998; p.200).

eHealth broaden the domain of ICT technologies and devices, including for example the use of audio, video and other telecommunications and electronic information processing technologies for the transmission of information and data relevant to the diagnosis and
Mapping business models for social service design in Healthcare

treatment of medical conditions, or to provide health services or aid healthcare personnel at distant sites (Maheu & Allen, 2009).
eHealth provides potential solutions given that the use of technology reduces the need to attend personally the patient while it provides an additional communication media to the elderly.
eHealth can address a number of benefits, such as: are:
- **Intensify and improve diagnosis and treatment** by sharing information in a faster way, regardless location and in real-time, with patients and between healthcare professionals.
- **Proactive lifestyle adaptation** if patients are constantly informed about their treatments, medications and conditions.
- **Effective aligning and managing the chain of care activities** that various healthcare professionals perform in for example disease management.
- **Patient empowerment** as a result of their growing access to information about diseases and treatments means that support health care services to provide a more focused on the patients’ growing demands and personal needs, which implies a necessity of tailor-made care.(i.e. Limburg et al., 2010).

So far, a large number of national and international research experiments showed that ICT-systems of eHealth helps patients gain control and moreover helps to reduce health problems associated with the illness. However, **Unclear business models** are one of the major innovation barriers for care providers. Low rates of eHealth implementations indicate that traditional business models of the health care providers do not fit with the self-directed patients and eHealth solutions (Gruber, et.al, 2009).

Herzlinger states that healthcare has become a “lose-lose proposition”, where consumers “pay way too much, and they get way too little” (p.105). She argues that the only way out of the current crisis, highly evident in the US, is to choose for a consumer driven health care model, where patients and providers jointly create and deliver care in better and cheaper ways. Currently the insurance companies, hospitals and government have dealt with a health care model in a top down matter, resulting in a cost increase and choice decrease. She proposes to put consumers in charge of health care as a way to start renewing a system based of consumers” demands and driven approach, which will result in freedom of choice, openness and transparency, and a tighter relation amongst stakeholders in order to create and deliver value (Herzlinger, 2007).

To establish a system of home care services that is good, safe, and available when needed, accessible and affordable for all, new designs of business models are needed to guarantee this for the future. In our exploratory research we found that: (1) for realizing home care solutions that combine patient’s self-management and eHealth technology, new business models for local healthcare networks are not available yet; (2) and an ecosystem of partners is needed to provide an integrated proposition that extends beyond the healthcare device and home care services itself, (Simons et. al., 2011).

**RESEARCH METHOD**

With five case experiments, we aim to open up the black box of the process of designing business models and look at what is actually designed. We experimented with designerly methods in the field of eHealth.

**SAMPLE**

Table 1 presents the case characteristics of the four case experiments in business model design. In our research by design we decided to experiment in one case project, for a telecom foundation, with Free format drawing of business model elements that build up a
value proposition by actors who provide value in exchange of cash also drawing the cash flows between the actors. In another experiment we set out for a field experiments with the activity map of a service blue print at a homecare provider. For a third experiment in the mental health we adjusted an actor’s map method to the purposes of the designer and invented the Net transaction tool. And finally in a case study addressing heart failure patients we invented a value transaction map based on an activity mapping tool. As co-designers in our experiments for designing a business model we involved a great number of users, professionals and managers that represent the actors in the network of transactions. Such as people from local institutions, companies, service providers, associations and local groups.

Table 1 Sample of cases experiments in designing transactions for social service design with eHealth

<table>
<thead>
<tr>
<th>Cases</th>
<th>eHealth issue</th>
<th>Mapping method</th>
<th>Co-designers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecom foundation NL (Vis, 2012)</td>
<td>Dedicated Mobile communication support for Deaf and Hearing Impaired People (HIPs)</td>
<td>Free-format hand drawing</td>
<td>19 participants • 6 HIPs • 3 HIP organisations • 7 Telecom managers • 3 Software developer</td>
</tr>
<tr>
<td>Homecare provider NL (Crossley Urrego &amp; Soto Camacho, 2012)</td>
<td>Tele-health care for elderly at their own home. Besides support for the nurses, playing games and social community talk is offered.</td>
<td>Service Blue print standardized format.</td>
<td>N.a.</td>
</tr>
<tr>
<td>Mental Healthcare institutes in Colombia and NL (Nino &amp; Ruiz, 2012)</td>
<td>Telemonitoring for mental health care service delivery at home and at the institution.</td>
<td>Net transaction tool</td>
<td></td>
</tr>
<tr>
<td>Health &amp; Wellbeing company (Griffioen, 2012)</td>
<td>Telemonitoring for Heart failure to keep patients out of the hospital and avoid readmission in the disease management.</td>
<td>Value transaction map</td>
<td>19 participants: • 5 HF Patients • 4 Relatives • 2 GPs • 1 Practice Nurse • 2 Cardiologists • 5 HF Nurses in 3 hospitals</td>
</tr>
</tbody>
</table>

ANALYSIS
In this research we used the business model maps in a meta-analysis on the visual displays. We analysed the design outcomes of the designer’s efforts in the different experiments. In particular we analysed the business model maps, the visual representations of the artefact produced by the strategic designer.

The contributions in the following sections are examples of methodics derived from designerly adaptation and reinvention of methods. All these examples are related to the business model problem in eHealth but are detailed in descriptions on designing transactions to provide interesting methodological insights into the area of business modelling.
SOCIAL CONTEXT
Almost one in ten of the world’s population lives with some kind of disability: limitations in vision, hearing, or dexterity. Currently there is a lot of development in mobile communication technology for Hearing Impaired People (HIP). Many of these products have the potential to improve their quality of life and self-confidence by increasing independency and decreasing uncertainties.

DESIGN CHALLENGE
In exploring earlier projects for HIP people of the Telecom multinational some interesting service concepts were identified, but many of these projects lacked a clear business model. The major design challenge in this case was to design a business model for the HIP in a network of the Telecom Foundation, Telecom business units, government, suppliers and non-profit organizations. This fuelled the vision of the strategic designer to design a new service proposition with a profitable business model for the HIPs. The new service was based on the philosophy of inclusive design, with the goal of creating and implementing a user centred service with a profit business model.

The first research was aimed to create insights in the communication behaviour and - needs of this specific group. The strategic designer immersed himself into the world of Deaf people and got to know a number of them by visiting a bar, a dance event and a sports tournament. From his observations, interviews and information from dedicated organisations and internet forums he synthesized customer insights. He described the following communication behaviour:

- deaf culture is a community on its own. The deaf people in the Netherlands feel part of a select group of people that master Dutch sign language (NGT) as their first language. Because it is hard to easily communicate with strangers on the street, this community prefers to connect to each other. Many deaf people go to special deaf bars and events where they come together. Deaf people even have their own sport clubs and Olympic games.
- text chatting for mobile communication is still the most preferred way of communication. Deaf people seems to have a preference for one telecom operator who offers data and text only SIM-cards for many years. There is special software available for some mobile phones to enable faster text chatting. This software makes it easier for deaf people to chat, but it is not very popular. Especially the price is a problem and due to the increased functionality of normal smart phones, the upgrade is not worth the money.
- video chat seems to be the best solution for communication between deaf people. Health insurance even pays for it. But it is not part of deaf culture and not 1 video chat system was requested in 2010! Computer based video chat programs are gaining popularity, but no suitable mobile version is available. Deaf people might be interested in video chatting on mobile phone when it becomes available, affordable and easy to use.

The second research had to provide insights in the stakeholder context of the Hearing impaired target group. After some design research by desk study and interviews an overwhelming number of parties seemed to be involved in the subculture of the HIPs. From the context map of a great number of potential actors, two organisations were chosen to explore collaboration options in the design and implementation of a new service proposition.
DESIGN OF TRANSACTIONS

In this case the strategic designer used free-format drawings inspired by flowcharts mapping techniques that were practiced at the service department of a large automobile company where design thinking was introduced. In a real time setting of a meeting, in this case with two actors from two companies

![Diagram](image)

*Figure 1: Business model map for mobile telecom service designed for hearing impaired people, Vis (2012).*

This free-format method starts with a blanco A4 paper and pencil and markers. The purpose is to draw the model by hand related to the oral explanations in the meeting. The drawing starts with the logos of the two companies and a drawing of the customer, in this case a HIP. So visually each stakeholder is given own starting point from where they can explore their position in talking about explicit scenarios of building up a value proposition for the customer. By drawing the flows of money, products and information in a very graphic representation it is possible to visualize a value proposition, but also the needs and doubts in an easy way. So there is not a ‘fixed’ business model format prepared in advance. With one blanco A4 size drawing and the help of oral explanation it is possible to make a first sketch of a complex business model in about 10 minutes.

After this first sketch individual stakeholders are visited to do a reality check. Each stakeholder provides feedback and detailed info on how to organize the process flows in the business model. For example ‘higher’ responsible management looked at the flows going in and out from the headquarters, and shop owners looked with specific attention to the flows going in and out of their shop. To our experience each stakeholder was directly focussed on
their own position drawn on the map. Knowing their own situation best, this also led to particular input and feedback on changing an actor, flow or detailing estimation. The handmade drawing can easily be changed and simplified by taking the pen and adding or scrapping lines and parties. This invites stakeholders to directly participate in the development. After every two or three meetings the strategic designer sketched a new version of the business model.

It happened that one of the first business model sketches survived only one meeting when a drastic change had to be made. Eventually, the business model for HIPs was sketched in 4 iterations: from a complex model where existing logistics needed major modification and collaboration with the new business partner, to a model where existing logistic flows of both companies get a minor addition. This model led to an agreement of partnership and within two months a new service for the HIP was launched and communicated broadly.

BUSINESS MODEL MAPS: SERVICE DESIGN FOR ELDERLY BY A HOMECARE PROVIDER

SOCIAL CONTEXT
In this case experiment we researched a homecare provider with several offices in the South region of The Netherlands. The homecare provider offers care services to elderly either at their own home or at one of the nursing houses or clinics. In order to improve the care services, this homecare provider has an innovation department in charge of executing new projects. Recently they received a grant from the government (AWBZ) to develop a pilot project in telehealth. Existing success and failure cases on the implementation of eHealth evidenced a need to better design services that create value for the different stakeholders, in order to be successful in the market. Additionally, most of the current cases are trials or pilot projects with a short term orientation and a small scale implementation. In order to effectively scale these projects to a mainstream level, it is necessary to plan ahead, visualize the different steps, determine how dynamics between actors and processes will change, be able to predict possible problems and foresee possible results.

DESIGN CHALLENGE
Using the Service Design framework, the design challenge is to address the research question of how eHealth services are structured from the business model point of view. And gather insights on value propositions of eHealth in transaction with profit formulas for the owner of the business models.

DESIGN OF TRANSACTIONS
The initial idea was to develop the service blueprint during the interview; however due to time constraints of the participants, the service blueprint was developed by the researchers based on the data gathered in the fieldwork and the coding of it. As for example:

Acquire:…For the moment the pilot is working with the fund from the government, but we are still not sure how we will charge for it in the future.
    ... So the patient fills out a form, the AWBZ evaluates and then decides if he can get the service from us.

Install:….We explain the elderly about what he will receive, actually is this is one person, because she has a car, she visits them and teaches them how it works.

Use:….the nurse at the clinic has certain schedules to make the calls to each of the elderly with the service.
    …to check on them remotely with the ‘Good Night’ Service.
Figure 2 shows the Service Blueprint canvas where by mapping the main stages of the service in a horizontal axis and the different actors in the vertical axis, it is possible to visualize the interactions between them as in a timeline.

![Service Blueprint](image)

*Figure 2: Homecare provider Service blueprint (Stickdorn & Schneider, 2010; Crossley Urrego & Soto Camacho, 2012)*

The vertical axis is divided in four rows corresponding to the main components of the service: It has the customer at the top while it goes deeper into the organizations processes including the front stage which refers to all the actors and actions that are in direct contact with the user, and the backstage which refers to all the actors and actions that are necessary to effectively deliver the service even if they never come into contact with the user. An extra line which considers internal actions provides further insight on support processes that also contribute to deliver the service (Stickdorn & Schneider, 2010).

**Front stage:** The eHealth technology includes: LCD screens installed in the homes of the elderly together with software that provides communication between the nurses and the elderly. Additional functions of the software are a social community where elderly people can socialize on-line and play games with other users such as Bingo.

...with this technology we offer our elderly a more frequent attention, we can call them to check on them and actually see how they are doing since the image quality is very good. They can also call us and start the video with just touching the screen, it's very easy to use for them, if they just want to talk to someone or if they need something, they can do it any time, there is always a nurse in the clinic to answer.

**Backstage:** The Home Healthcare provider has handled everything in-house buying the technology from PAL4 and future plans to install iPads instead of LCD screens. By using Service Blueprinting we mapped existing services in healthcare related to the implementation of ICT due to the fact that it can provide a clear visualization of the current situation of the services offered and their interrelations with the existing environment in healthcare services. Moreover it can show the relation between the different actors and the technology being implemented revealing the strengths and weaknesses of each offering. Unfortunately the pilot project hasn’t been fully executed due to the fact that many people have rejected the technology or haven’t participated actively.
BUSINESS MODEL MAPS: SERVICE DESIGN FOR MENTAL EHEALTH _ @MENTAL HEALTHCARE INSTITUTES

SOCIAL CONTEXT

Colombia and The Netherlands were the countries selected in this comparative case. Colombia has one of the highest performances in health among the Latin American nations based on the World Health Organization (WHO). It is highly rated in fairness of financial contribution. Colombia is the second best country for scientific and health infrastructure in Latin America (IMD, 2008). The Netherlands is one of the nations with the most responsive (availability of resources) health systems. It has an innovative social health insurance system, where patients choose the provider and health insurance policy which best fits their situation. Information about price and quality are available to consumers.

Table 2 Healthcare in Colombia and The Netherlands (WHO, 2010).

<table>
<thead>
<tr>
<th></th>
<th>COL</th>
<th>NL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total expenditure on health as a percentage of gross domestic product</td>
<td>6.4</td>
<td>10.8</td>
</tr>
<tr>
<td>General govern. expenditure on health as a percentage of total exp. on health</td>
<td>84.2</td>
<td>77.2</td>
</tr>
<tr>
<td>Private expenditure on health as a percentage of total expenditure on health</td>
<td>15.8</td>
<td>15.2</td>
</tr>
<tr>
<td>Out-of-pocket expenditure as a percentage of private expenditure on health</td>
<td>50.0</td>
<td>37.7</td>
</tr>
<tr>
<td>Private prepaid plans as a percentage of private expenditure on health</td>
<td>50.0</td>
<td>33.7</td>
</tr>
</tbody>
</table>

Table 2 shows that The Netherlands invests a higher percentage of its gross domestic product in health than Colombia does. The private and out of pocket expenditure on health are higher in Colombia than in the Netherlands. Comparing countries coming from different socio-economically stages of development we believe to enrich the mappings. Our purpose is compare and contrasts the similarities and differences in the contexts two different countries; a post industrialized one and a developing country.

More specific this experiment concentrates on Mental healthcare. Institutions for mental healthcare that actively conduct research and treatment with patients, ranging from drug abuse rehabilitation to hospitalization and monitoring of bipolar disorders. These institutions provide comfortable housing or stay, where patients have dignity through nice green surroundings and fulfilling social and independent activities.

Telemonitoring is perceived as an apparent opportunity to meet today and tomorrow’s mental health care service delivery. However without including these new technologies within an integrated system of wider care, services, resources and processes, its chances of succeeding would decrease.

DESIGN CHALLENGE

The main design challenge in this case experiment was to explore and design exchange relations in a stakeholder network of health care organized in order to identify business models opportunities for customer-centred eHealth in the context of Mental Health Care. And in particular the mapping challenge was to investigate:

- How are the actors actually connected and related to each other?
- What are the desired contributions and demands of the different actors?
- What is the level of satisfaction or investment in these relations?
Figure 3: Net transaction model map (Nino & Ruiz, 2012).

DESIGN OF TRANSACTIONS

A new designerly tool was devised by combining the Human Centred Design toolkit (2012) and the Net-Map tool (Schiffer & Hauck, 2010) used in field studies. The purpose of our net transaction map tool is to identify relations amongst actors, and derived possible new services and ways to deliver those. From the HDC toolkit we selected the desirability “Lenses”, which aim to identify “what people want”, and the “community driven discovery” lens identifying stakeholders in a network or community, as key holders of insights and clues.
Mapping business models for social service design in Healthcare

for system solutions. From the Net-Map tool we took the interview-based method to visually capture connections, monitor and evaluate situations with many stakeholders’ influences and outcomes. This tool is based on defining roles of influencers, stakeholders, and moreover to address the network situation of HOW and WHY stakeholders are linked. We adopted several steps to guide the tool. We prepared two specific templates in advance that could also be used on an iPad: one for patients and informal care giver (Familiar-Loved one) and one for a formal care giver (Specialist, Therapist, Nurse).

To start the net transaction mapping we provided the interviewees with the templates an additional instructions sheet and four colour makers. Then we invited the participant to: 1. Identify and name main actors, 2. Create and draw link relations with arrows of different colours, 3. Note degree of satisfaction or investment with the service you are receiving by ‘colouring the dots’.

From the individual datasheets we developed a disaggregated visualization, which was grouped so that it could be contrasted between the formal and informal caregivers in The Netherlands and in Colombia. The transaction mapping was visualized separately and the relations and the level of satisfaction or investment were grouped by type of relation among the different groups as seen in figure 3. The amount of arrows repeated between stakeholders’ shows a stronger relation. The arrowhead points the receiver in the relation, which can be both sided and dotted lines shows a weak or missing relation perceived by the respondents. The level of satisfaction or investment was measured and translated into percentages to support the visual analysis, which is synthesized in figure 3.

For the Netherlands the care service map presents a service in a network of relations in a tighten configuration of reciprocal relations between the actors. The service map of care for Colombia shows more disconnection, as all arrows exchange relations of care service point at the patient. This creates a non-reciprocal and passive assumption with regard to the patient contribution with regard to the relation and the service. See figure #. Care in Colombia is perceived as neutral to satisfactory, with the main stakeholders’ satisfaction level in 60% and below. Mental health care services in the Netherlands are perceived as satisfactory, with levels of satisfaction above 67%.

Money is an issue in both countries. Parties involved stated the mental health service is expensive and they are not willing to pay extra money or simply they do not have extra money to invest in e-health. Currently the money aspect is taken care of by the health insurance. In the Netherlands the government is involved with subsidies. The profit formula is less clear in The Netherlands, where money relations cross in different directions that are not entirely repeated among participants, whereas in Colombia the money flow is clearer but also extra money is paid directly to the organization for better or extra services. See figure #.

Advice is covered from all the stakeholders in relation with the patient (green double headed arrows). Advice is not only provided by the specialist to the patient, but it is an asset that can and should be provided from any of the stakeholders involved in the network; this understanding their condition and level of advice to be offered. For instance patients believe that they hold valuable advice regarding their medical needs, and want to be empowered to share those widely. Currently there is a weak advice relation within the insurance company and the patient, where patients feel that insurance companies are not delivering a clear support about the alternatives and regulations of the services. Advice must flow along the entire network (green dotted circle), in order to reach effectiveness with the available resources and be tuned in the same direction. This flow of information is actually weak and could be enhanced by setting common and transparent goals within a clear business model concept. eHealth business models strengthen, increase and leverage the flow of advice and information among the stakeholders.
MAPPING 4: BUSINESS MODEL DESIGN FOR HEART FAILURE PATIENTS_ @HEALTH & WELLBEING COMPANY

SOCIAL CONTEXT
Heart failure (HF) is one of the major diseases in West-Europe with prevalence between 1-2%. From the exploratory research we learned that between 47-70% of all healthcare costs for HF are due to hospitalisation including readmissions. Telemonitoring is focused to keep patients out of the hospital and avoid readmission and therefore could cut back on the largest cost for HF disease management. Real business models including terms such as value proposition, profit formula, key resources and key processes are non-existent, yet.

DESIGN CHALLENGE
The design challenge in this case study is to investigate the ‘service design’ of heart failure management. HF disease management is a complex subject involving several stakeholders including the HF patient, General Practitioner (GP), GP assistants, specialists (cardiologists) and HF nurses. Also involved are hospitals, municipalities and relatives. The second design challenge is to gather insights into the daily practice of HF disease management.

DESIGN OF TRANSACTIONS
The value transaction mapping tool that we designed in this case is inspired by the book ‘This is Service Design’ (Stickdon & Schneider, 2010) in combination with the ‘IDEO Human Centred Design Toolkit’. The activity mapping tools for creating a context map and personal journey are adjusted to the transaction element of a business model. The purpose of our value transaction mapping tool is to communicate roles and transaction relations. For this type of mapping we prepared a set of actors’ cards and a concentric context map with the HF-patient in the middle. Actors are either represented with an infographic of a person or a building, representing an organisation as actor. In our case these cards represent actors in HF disease management. The set includes cards representing the HF patient, relatives, GPs, GP assistants, specialists and HF nurses. Furthermore, the organisation actors’ cards represent insurers, the government, municipalities and employees. In addition, the set includes blanco cards for additional actors that are mentioned in the conversation.

This value transaction mapping tool starts with a blanco A3 paper, colour markers and a set of actor cards and the concentric stakeholders map. The interviewee is invited to map the actors and the transactions by drawing relations of: care providing, emotional relation, financial flow and other influence or relations of providing information and advice.

Different actors were invited to create visual maps and diagrams: asking patients, relatives, GPs, specialists and HF nurses. Drawn from the raw data maps eHealth service scenarios were mapped. In our case the first scenario presents telemonitoring treatment provided mainly by the hospital: the HF nurse and the cardiologist, yet there are also other specialists involved such as the digestive diseases specialist and nephrologist. The second scenario is one in which the practice nurse and GP are mainly responsible for delivering the necessary care to the patient. The third scenario mapped is the final phase of home care assistance or moving to a nursing home. This last phase in HF disease management is focussed on controlling symptoms and containing as much as possible the quality of life. Care is focussed on the patient and making his days as bearable as possible. Then there is no more focus on the numbers, tests and graphs.
Figure 4: Scenario’s for telemonitoring business model owners in the Netherlands (Griffioen, 2012).
DESIGN OF TRANSACTIONS IN ARTEFACTS

In our cases we experimented with four types of mapping methods. From free format hand drawing mapping to value transaction mapping (see table 3). We adopted one method from social construction studies (Human Geography), the Net-Map and adjusted in combination with the human centred design toolkit this to a net transaction tool. For strategic designers, analysis and design are reciprocal activities, and the mapping of a current business model provides a base for redesigning this into a future business model. In the context of eHealth, a number of ICT elements are added. Three other maps are inspired on designerly methods such as flow charts, context maps, activity maps and service blue print. The latter was used without further adaptation apart from a few money flow arrows. The free format drawing and the value transaction map are established through new combinations and particular development of business model elements into the map. Both maps relate actors and transactions of value propositions and cash flows, and more. In the free format drawings also transportation and product elements are drawn. In the value transaction map emotional links and information and advice relations are added.

<table>
<thead>
<tr>
<th>Cases</th>
<th>Mapping method</th>
<th>Actors objects</th>
<th>Transaction Design</th>
<th>Co-design ease of use</th>
<th>Visual quality clarity of result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecom foundation NL (Vis, 2012)</td>
<td>Free-format hand drawing</td>
<td>Hand drawing of logo’s, Customer, and value chain elements like Distribution centre, Store. Telecom org. and Dedicated software provides represented by Logo’s. Customer Retail shop Distribution hub</td>
<td>Four types: -Service proposition elements: mobile phones, software package, box package, manual etc.; -Money flows -Information flows -Transportation flows.</td>
<td>Medium Designer draws input form two partners Designer draws detailed input form experts for reality check with experts</td>
<td>Medium Sketches are meaningful for the actors involved but are not self-explanatory.</td>
</tr>
<tr>
<td>Homecare provides NL (Crossley Urrego &amp; Soto Camacho, 2012)</td>
<td>Service Blue print standardize d format.</td>
<td>By keywords the names of the actors can be added.</td>
<td>Money flows are added</td>
<td>- N.a.</td>
<td>Low An abstract matrix or canvas provides the structure for a high level service process</td>
</tr>
<tr>
<td>Mental Healthcare institutes in Colombia and NL (Nino &amp; Ruiz, 2012)</td>
<td>Net transaction tool</td>
<td>Prefab actor icon (“puppets”) on template and infographics dedicated to eHealth network of formal and informal caregivers.</td>
<td>Hand drawn of four types: -Care Service -Money -Advice/Info -Monitoring</td>
<td>Low Arrows in single prefab template becomes too messy and complex.</td>
<td>Medium Separate analysis views per transaction provide more overview but lack interactions views.</td>
</tr>
<tr>
<td>Health &amp; Wellbeing company (Griffioen, 2012)</td>
<td>Value transaction map</td>
<td>Cards with infographics of people and buildings dedicated to HF disease-management</td>
<td>Hand drawn of four types of transaction - care providing - emotional relation - financial flow - influence relations of information and advice.</td>
<td>High Effective in modelling a value network efficient in time Reusable other types of patient journey map.</td>
<td>Medium Demarcation of business model domain is clear but the abstract level of this context is too high for modelling the value proposition.</td>
</tr>
</tbody>
</table>

In table 3 the mapping methods are classified according to designing actor objects and transactions, and their quality for ease of use in co-design and visual quality of the result.
The Free format hand drawing method we qualified with a medium ease of use in co-design because the participants in this case did not draw themselves. The strategic designer draws the scenario's that are told by the participants in the meetings. Furthermore, because the model is made by hand this doesn’t preoccupy the participants and supports the orientation and exploration nature of the meeting. Furthermore, the business model is not already ‘fixed’. On the contrary, the hand drawing method is extremely flexible, typical elements are draws depending on what ‘pops up’ in the conversation. Also the drawing of business model scenarios is time effective. In this case business model sketches were incrementally redrawn until a last simplified end result. However, for an outsider the clarity is harder to grasp. The visual quality of these results we qualify as medium.

The Service blue print method that basically is a matrix or canvas provides the structure for a high level service process. Key words need to describe the transaction and actors can be added with their names. This method is not very suitable for designing transactions and visual explanation.

The experiment with the Net transaction tool resulted in a surprisingly complex overview. The strategic designers were overwhelmed by the messy of all four transactions in a single template. In the analysis stage of the mapping method the transparency was increased by separating for each type of transaction a view. Overall, we qualify the ease of use of one template low and the visual quality medium.

The Value transaction map appeared to be more flexible through making cards for the actors. These cards could also be used for a customer journey map. For the business modelling in this case the transactions were hand drawn. By use of semi-structured interviews and the value transaction mapping tools, the executing of the exploration research, was experienced as highly efficient and effective. The mapping tools proved focus and lead to direct results. We qualified the ease of use of the tool in co-design high and the visual clarity of the results is also medium. The result is provided on the abstract level of a context map that is too high for modelling the transactions in a business model.

To conclude, the best business model mapping tool needs still to be developed.

We provide these examples of designerly approaches to inspire for more experiments and practising with mapping methods for business model design. Most of all, there is visual room for improvement.

IMPLICATIONS FOR THEORY AND PRACTICE

By 2040, The Netherlands will have 4.5 million inhabitants older than 65 years. Many of them are active participants within their communities, as evidenced by their involvement in (voluntary work) and informal care provision they carry out. Their healthy life expectancy and favourable socio economic position opens the way to a relatively long social life. For these elderly living at home, accessible local care plays a part in helping them to be independent and direct their care processes for as long as possible. Managerial implications of our research findings concerns contribution to:

A. Initiate Design-led project on business model design for new services.
B. Use case examples as inspiration for these projects. Contributing to the body of knowledge of design theory, on the particular theme of designing business models:
A. with visualized business model maps
B. design-led method of mapping Exchanging views with the international scholarly community and advance the state of the art in design management research, theory, and practice on design models.
CONCLUSION

Strategic product designers have the ability to contribute to the solution of business models because of their attitude towards product-human interaction and in services, the human-human interaction. By using, and adequately adapting business model concepts from corporate strategy we took the lead in designing business models in five experiments in eHealth and built upon our capabilities and invent methods and tools for creating business models in a designerly way.

With our attitude of exploring and framing problems, we got introduced to business model concept definition and identified a gap in modeling new business model designs. In five experiments we took the lead in designing business models and built upon our capabilities and invent methods and tools for creating business models in a designerly way. This paper offers some insight about the design contribution in modelling new business models from these experimental cases. We provide these examples of designerly approaches to inspire for more experiments and practicing with mapping methods for business model design. More research in design can contribute in crafting an optimal tool for designing transactions between actors in new business model designs.

REFERENCES


CBS (2010)


Stickdorn, M., & Schneider, J. (2010). This is Service Design Thinking. Amsterdam: BIS Publishers.


Mapping business models for social service design in Healthcare


HTTP://WWW.IDEO.COM/EXPERTISE/BUSINESS-DESIGN/