

XXV. International RESER Conference: Evaluation of design thinking for the creation of service innovations in developing countries

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The constantly growing services sector in developing countries has the potential to sustainably contribute to the people's well-being and foster overall development. This especially applies to educational and health care services whose demand and supply often do not fit due to non-existing or traditional, product based marketing instruments in use. In response to this misfit, we propose to employ design thinking methodology. Therefore, we conduct a case study demonstrating the creation of health care service innovations in Kenya using design thinking methodology. Our findings prove that design thinking methodology is promising but still struggles to convince compared to conventional business paradigms.

1. Introduction

Developing countries face several challenges when it comes to service innovation. In the so called “bottom of the pyramid” markets (BOP markets; Prahalad, 2012, 6) insufficient infrastructure causes a series of problems (Berger; Nakata, 2013). People live scattered in the whole country. Scarce road systems make it difficult to reach people face to face (cf., 1200). Missing electricity and telecommunication infrastructure aggravates the introduction of information and communication technologies (ICT) crucial for many service innovations (e.g. Barrett; Davidson; Prabhu; Vargo., 2015; Bygstad; Lanestedt, 2009; Miozzo; Soete, 2001). Future staff and future clients require a greater amount of training as a result of insufficient or missing means of acquiring, e.g. a television or a personal computer (Berger; Nakata, 2013, 1204). Furthermore, low levels of literacy and numeracy pose additional challenges for the roll out of service innovations (cf., 1200). Although not referring to service innovation in specific, Anderson and Markides (2007) put it precisely arguing that innovation in developing countries and their markets has its focus not on “finding customers than addressing issues of product affordability, acceptability, availability and awareness ” (88).

The inhibiting constraints for the innovation processes sketched before probably constitute the most urgent areas of innovation. In particular, infrastructure in terms of electricity and telecommunication is one big area where innovations can be seen as means of improving living conditions for many people. Berger and Nakata (2013) dealt with the subject of technology implementation for financial service innovation. They conducted a multiple case study analysis. Their findings indicate that, because of the specific conditions present, e.g. low income of potential customers and insufficient infrastructure, companies have to adapt their products and services, e.g. in

terms of pricing and paying infrastructure. These results also correspond with the findings of Anderson and Markides (2007, 83-84) that analysed several examples and demonstrated the need for companies to adapt to the exceptional conditions in BOP markets. Education and, although not mentioned before, health and social services also belong to the areas where innovation leads to improvement of people's welfare. At the same time these services rely on infrastructure and are more efficient when ICT is used. As in the case reported by Berger and Nakata (2013) technology implementation is only the first step. If people did not get into touch with technologies such as ICT before, issues in relation to literacy, culture, and technology acceptance have to be taken into consideration. Thus, fostering innovation activities in developing countries and BOP markets respectively demands an approach that is flexible enough to embrace the specific and manifold conditions that apply in developing countries.

In this paper we present the method of design thinking as an appropriate approach for this task. Design thinking is user-centred (Rhinow; Meinel, 2014, 245-246). It is an approach that divides out a problem before solving it. By this a problem is illuminated from different angles. This wide view is even intensified and complemented by including stakeholders in the design thinking process. If we consider, e.g., a service innovation settled in the field of telemedicine, there are several groups of people that "get in touch" with such an innovation. From all these groups of people a representative is included in the design thinking process and thereby bringing in important inputs. This might be particularly relevant stakeholders participating in the process are very different; especially in terms of their living environment. For instance, developing a telemedicine service for first world patients will not be suitable for patients in developing countries. Furthermore, the design thinking approach incorporates the conditions that apply to the innovation setting. We stressed before that these conditions in developing countries differ in comparison to the ones we experience in, e.g., in Europe.

The objective of this paper is to evaluate design thinking methodology as means of creating service innovations in developing countries. Thus the remainder of this paper is organized as follows: Section 2 describes the process of design thinking from a theoretical perspective. We then explain our research methodology in Section 3 and present a case study settled in the area of health services in Kenya in Section 4. The results of our case study analysis are presented in Section 5. Section 6 discusses lessons learned and draws on resulting research gaps. Our work is summarized in Section 7.

2. Learn how to innovate: the process of design thinking

Defining design thinking requires comprehension of the term design itself. Today "to design something" does not only mean to give something tangible a shape or "to make things" (Kimbell, 2011, 290) respectively. Instead, the term design has experienced a twofold upgrade in relation to its meaning: First, design is not only affiliated with tangible products but with services as well. Second, the notion that something that is designed resulted from a "sudden breakthrough (...) [or] the lightning strike of genius" (Brown, 2008, 4) is broken up and demystified. Instead, design is revealed as a process incorporating not the one and only design method but a compilation of

methods for problem analysis and problem solving (Simon, 1969 cited by Kimbell, 2011, 290-291). Although this broadened view on design might meet with what we intuitively perceive as design thinking, the concept as such was first discussed by Rowe (1987). Although Rowe is considered to have a slightly different understanding of design thinking methodology than businesses understand it today due to his work as a professor for architecture and urban planning (Liedtka, 2014, 2). Design thinking as means of "(...) [addressing] the needs of people who will consume a product or service and the infrastructure that enables it" (Brown; Wyatt, 2010, 29) was brought up by IDEO, a consulting firm focusing on the development of innovations. Design thinking methodology experienced a boost in development when IDEO started receiving more requests aimed at the development of service innovations. This triggered a shift in how design thinking methodology was used and perceived. Today, design thinking methodology is not only a means of designing new products and services. Instead it is a method to design new experiences for customers (Brown; Wyatt, 2010, 29).

In the following, we provide a "look and feel" of design thinking methodology and take a closer look at the process itself. Therefore, let us consider a cooking recipe and the correspondent cooking process. The recipe tells you what you need for preparing a meal: ingredients, know-how or experience, and cooking equipment. The cooking process as such is linear, except for some iteration concerning the addition of some seasoning. Though, linear components of the process remain dominant. Switching perspectives from cooking to business, we admit that there are linear processes in business as well, e.g., production processes, also containing phases of iteration, e.g., quality management. However, when it comes to activities in businesses that inhabit some kind of developmental activities the predominance of linearity vanishes. Instead, non-linear components, such as iterations, loops, etc. outweigh the linear components. Such a non-linear nature coincides with the perception of design thinking methodology in research. Brown and Wyatt (2010, 30; also Brown, 2008, 4) pictured the process "as a system of overlapping spaces". This in line with Ingle, who characterizes the process as being of an "adaptable [and] flowing nature" and "with no direct line from Point A to Point B" (2013, 4-5). Cross (2011) carried out several case studies and uncovered one of the fundamentals of design thinking methodology: he recognized that people employing design thinking were continuously changing their perspectives from the problem side to the solution side and vice versa.

Despite the unique nature of design thinking processes, there are elements every design thinking process consists of (see Figure 1). Brown (2008) and his colleagues (Brown; Wyatt) speak of three elements: 1) inspiration, 2) ideation, and 3) implementation. Ingle (2013, 3-4) elaborates on these elements in more detail and divides the elements of inspiration and implementation into two sub-elements ("understand" and "define" and "prototype" and "test" respectively). Meinel and Leifer (2011, xiv Fig. 1) identify five common phases of design thinking.

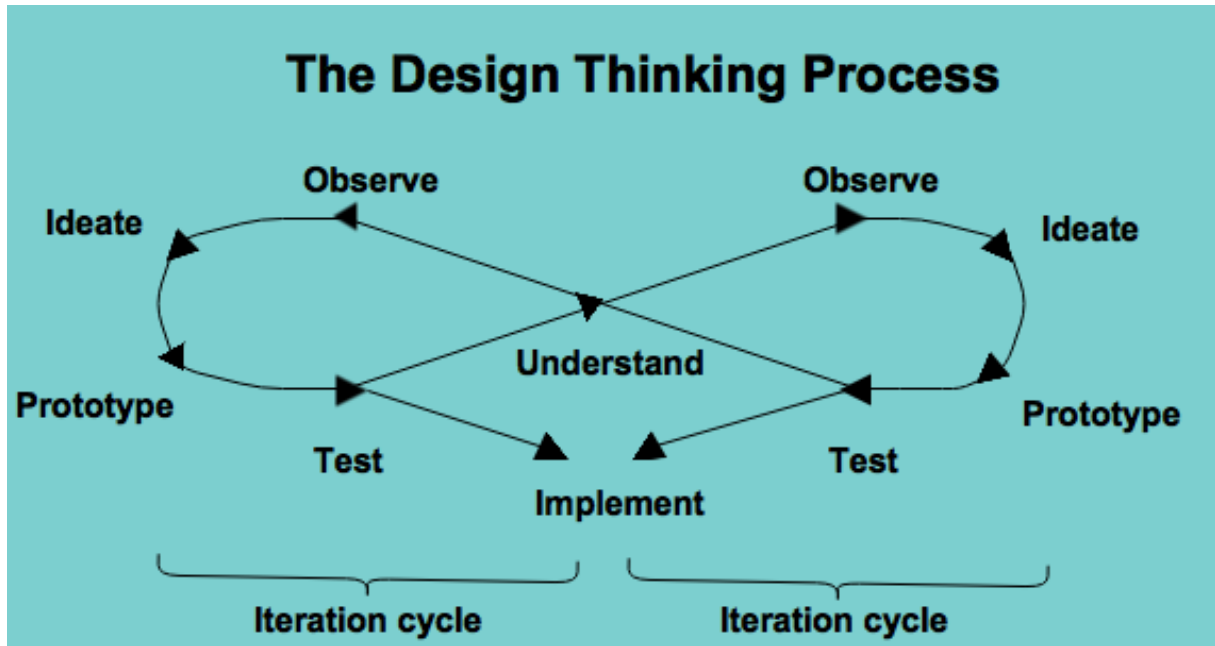


Figure 1: Elements of the design thinking process
Source: Data adopted from Ingle, 2013, 3-15; Meinel; Leifer, 2012, xiv Fig. 1

Every design thinking process starts with briefing providing the basic parameters of the project such as available resources and time frame (Brown; Wyatt, 2010, 30). The next step is to gain a deeper understanding of the problem at hand (Ingle, 2013, 5). Therefore, you have to determine who you address with a solution. This means not only to give the target group a name but to collect data about diverse parameters that draw a precise picture of the members of this group. This helps to get an idea of how the problem is perceived by the target group and its needs and desires (Brown, 2008, 2; Ingle, 2013, 6). Especially, when the solution is a service there are more stakeholders that have to be considered, e.g. people who deliver the service. They as well are affected by the problem at hand. Their perspective on the problem has to be explored too. If not a solution might be developed for the target group but fails to be delivered because the correspondent providers where not considered in the process. Exploring the stakeholder's different perceptions of a problem can result in the realization that different groups of people perceive the problem differently (Thienen; Meinel; Nicolai, 2014, 99). For the data collection diverse sources and methods can be used. In order to design an experience, the observation of the experiences of the stakeholders presents an appropriate starting point (Brown; Wyatt, 2010, 30). The better your data, the better your comprehension of the problem will be and the easier it will be to specify the problem in-depth (Ingle, 2013, 6).

Therefore, the before gathered data and the information about the problem from the different perspectives of the stakeholders have to be joined together. As a result a "stable problem view" is achieved (Thienen; Meinel; Nicolai, 2014, 99) which is required if possible solutions shall suit all stakeholder's needs. Furthermore, the consolidation of the different point of views enhances re-evaluation of the problem itself (cf., 101) and fosters a more detailed definition of the problem. Dedicating time and effort for the definition of the problem can reveal aspects that have not been considered before. They could have been the cause why the problem is still unsolved or former solutions did not work (cf., 100).

With the well-defined problem at hands, there begins the phase of ideation. Using creativity techniques, e.g. brainstorming, the participants of the design thinking process think up solutions for the problem (Ingle, 2013, 7). Every creativity technique has its peculiarities and demands specific things when coming to realization (Brown; Wyatt, 2010, 31). Apart from those specialties, Ingle (2013, 8-9) emphasizes rules to get the best out of ideation sessions. She states that before every ideation session its goals should already be communicated to the participants. By this, their minds already start to chew the problem over. Then, when the ideation session takes place participants already might have in mind solutions for the problem. Different stakeholders are involved in ideation sessions. Outside of the design thinking process these stakeholders differ in terms of background, education, position in the company or institution. It has to be made clear that during ideation sessions there is no hierarchy. Instead there is freedom to speak and the etiquette of listening when someone presents his or her ideas. Furthermore, a moderator is needed to ensure that the sessions keep focused on the defined problem and participants do not get stuck on a single issue. Besides, a moderator should actively engage in the time management and keep an eye on the group's energy and pause or finish sessions adequately. A proper documentation of the results is obligatory. Ingle (2013, 9) even suggests to document results redundantly.

The implementation phase contains prototyping and testing activities. Especially, when there resulted a bunch of ideas from the ideation phase, probably not every idea will be prototyped and tested. Therefore, the results of the ideation phase have to be sorted. To do so, researchers propose different approaches. Ingle (2013, 10) suggests evaluating the ideas from a business perspective and to differentiate them into different categories ranging from feasible and realistic to dreams of the future. Subsequently, feasible ideas should be re-evaluated in regard to the available resources and the extent of contribution to the solution of the problem (Ingle, 2013, 10). If there no ideas that fulfil the conditions of feasibility and affordability, and show a great promise in relation to the solution of the problem, you have to go back to the ideation phase and make up more ideas (Ingle, 2013, 11). Prototypes can be simple (Brown, 2008, 2) but at the same time should embrace what is essential for the solution (Ingle, 2013, 11). In other words, the prototype should serve you when tested (Brown, 2008, 2). Starting with the prototype of the ideas that needs least resources supports the starting of the prototyping process. By this, the motivation of the team is likely to keep stable and enhance a productive environment for this phase (Ingle, 2013, 11).

In the following test phase prototypes will be evaluated. Therefore, representatives of the different stakeholders that are using the solution or are affected by it should be recruited for testing (Ingle, 2013, 13). Documentation of the test results is essential and realized by different means, e.g., written reports, videos, audio recordings, images (cf.). Afterwards, the documented data is analysed. Common concerns, reactions, e.g., expressed by means of body language, or suggestions of the different stakeholders are aligned to clusters. Each cluster represents an important topic for the further development of the solution and has to be considered carefully (Ingle, 2013, 14). When each prototype was tested, an analysis and comparison of the test results reveals weaknesses as well as strengths of each prototype. Weaknesses and strengths have to be evaluated on basis of their importance for the solution. There may be major and minor weaknesses and major and minor strengths. Furthermore, it has to be considered that test results are a composition of the feedback of stakeholders that are affected by the solution in different degrees. This means a weakness

reported from a stakeholder affected in a high degree should be top priority (cf.). In the end, best alternatives are selected for further development. If none of the prototyped alternatives worked out well it should be investigated what went wrong. By this the team knows to which phase they have to go back and start again.

3. Methodology

A qualitative approach using a case study with a single-case design is employed to prove our research propositions. We decide for a single-case design because of several reasons. First and being most important, the data available did not allow for a multiple-case design. Furthermore and in line with Yin (2003), we argue that the single-case design is justified because of the representative and revelatory nature of the case (41-42). Although the application of design thinking methodology is not yet that common in business, it still has earned its position in the group of innovation methodologies (see Section 2). The idea of applying design thinking methodology to BOP markets is not new. In conclusion, we consider the case presented in Section 4 to be representative. Still, as the diffusion of design thinking methodology is not yet finished, conducting a case study which was carried out in a BOP market may uncover new knowledge about the application of design thinking methodology in such settings. Therefore, we regard the case as of being of a revelatory nature too. In the style of Eisenhardt (1989), we conduct our case study with the following steps.

Defining a research question. We want to prove our proposition that design thinking is a promising/sound method for the development of service innovations in developing countries. In doing so, we want to uncover the potential of design thinking methodology as a means to develop innovations customized to market conditions, customer and stakeholder needs. Thus, we define our first research question as follows:

RQ 1: "How is design thinking methodology contributing to the development of service innovations in developing countries?"

Design thinking is a demanding approach in terms of openness, patience, enduring motivation, and thoroughness required from the participants of the process (see Section 2). Additionally, every design thinking process is conducted in specific and unique circumstances. As a result, the course of events and the outcomes of the process are highly non-predictable. Hence, insights from a case study may provide lessons learned helping to improve design thinking processes in the future and derive implications for practitioners. Accordingly, our second research question is:

RQ 2: "Which are the lessons learned to improve future design thinking processes in developing countries?"

Case selection. This paper's objective is to demonstrate that design thinking methodology is an appropriate means for creating service innovations in developing countries. Therefore, we chose to present a case settled in the country of Kenya which is, according to the latest World Economics Situation and Prospects report (2015, 140) a developing country. The project described in our case study aimed at the development of a service that helps reducing child and maternal mortality in Kenya.

Data sources and data collection. Data was retrieved from different sources and in different forms. Above all, two of the authors of this paper were involved in the project

described by the case study. They were on-site and participated actively in the process taking the roles as a member of the Telekom team and a coach guiding and directing the process. They provided data by inputting their direct and participant observations. Moreover, they provided documentation in various forms such as presentations and photos. Data about Kenya and the issue of child and maternal mortality was retrieved from governmental sources of the country of Kenya and from the inter-governmental organization of the United Nations and its subsidiaries like the World Health Organization.

Case analysis. In order to analyse our case and find answers to our proposed research questions, we decided to adopt the approach employed by Berger and Nakata (2013). They conducted a case study dealing with the implementation of financial innovations based on ICTs. Using the Socio-Technical View, Berger and Nakata (2013, 1201) assessed which circumstances of ICT implementation facilitated or aggravated the implementation of financial innovations. In doing so, they depict which conditions and circumstances surrounding the innovation process have to be considered during the innovation process to achieve the highest possible fit between innovation and market. As a result, they defined eight research propositions grouped into socio-human conditions, governmental-regulatory conditions, and market conditions (cf., 1204-1208; see Table 1).

Socio-human conditions	
1) ICTs for financial service innovations in BOP markets are more effectively implemented when customer limitations such as low literacy, lack of identification, and technology unfamiliarity are addressed.	1) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because customer limitations such as low literacy, lack of identification, and technology unfamiliarity are addressed.
2) ICTs for financial service innovations in BOP markets are more effectively implemented when support agent limitations such as technology and business development uncertainty are addressed.	2) Health care service innovations in BOP markets developed by using design thinking methodology exhibit a good market fit because support agent limitations such as technology and business development uncertainty are addressed.
3) ICTs for financial service innovations in BOP markets are more effectively implemented when staff accepts the technology and are trained to support its use by customers and agents.	3) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because community health worker's technology acceptance and the need for training to support technology use by customers and agents is addressed.
4) ICTs for financial service innovations in BOP markets are more effectively implemented when staff monitor and adjust the technology after introduction.	4) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because health care staff monitor and adjust service offers and technology after introduction.
Governmental-regulatory conditions	
5) ICTs for financial service innovations in BOP markets are more effectively implemented when the governmental-regulatory environment is understood, opportunities for technologies exploited, and government relations cultivated to support their use.	5) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because the governmental-regulatory environment is understood, opportunities for technologies exploited, and government relations cultivated to support their use.
6) ICTs for financial service innovations in BOP markets are more effectively implemented when governments install, or allow banks to	6) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because

install, sound EFT switches and provide facilitative regulations around usage.	governments install, or allow providers to install sound ICT-infrastructure and provide facilitative regulations around usage.
Market conditions	
7) ICTs for financial service innovations in BOP markets are more effectively implemented when market conditions such as an underdeveloped financial sector and low financial literacy are addressed through educational programs.	7) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because market conditions such as an underdeveloped health care sector and low levels of health education and health literacy are addressed.
8) ICTs for financial service innovations in BOP markets are more effectively implemented when market conditions such as few capable business partners and evolving competition are anticipated and responded to.	8) Health care service innovations in BOP markets developed by using design thinking methodology, exhibit a good market fit because market conditions such as few capable business partners and evolving competition are anticipated and responded to.

Table 1: Research propositions by Berger and Nakata (2013) and derived evaluation criteria

Source: Data adopted from Berger and Nakata, 2013, 1204-1208

Originally, the Socio-Technical View was used to assess the fit of technology to technology users, technology purpose, and setting of technology use (Berger; Nakata, 2013, 1201). This pattern of thought matches the user-centered paradigm embraced by design thinking methodology. Therefore, we want to join the Socio-Technical View with design thinking using the research propositions set up by Berger and Nakata and transform them into criteria to evaluate the fit of design thinking to the setting of developing countries.

The research propositions created by Berger and Nakata have to be adapted to the present case study. First, our case study deals with child and maternal mortality rates and possible service solutions aiming at the reduction of these rates. As a result, we altered this key aspect in the research propositions from ICT and financial service innovations to health care service innovations. This included integrating stakeholders involved in health care, e.g., community health workers. Second, there is one solution in our case study where ICT plays only a minor role. Consequently, we put into focus not the technology needed to realize a solution but the solution itself. Finally, we do not want to limit our analysis to the outcome of the innovation process. As our aim is to evaluate design thinking methodology when applied for the development of service innovations in developing countries, the method has to be included in the research propositions. The adjusted research propositions constitute the basis for our case study analysis and the evaluation framework we need to prove our research questions.

4. Learn how to innovate: design thinking in Kenya

The case is settled in Kenya, Africa. Kenya is one of the Sub-Saharan African countries where child and maternal mortality rates are still high. Reduction of child and maternal mortality rates are one of the Millennium Goals of the United Nations Development Program to be reached in 2015 (Millennium Development Goals (MDG) Acceleration Framework, 2014, 19-20). Therefore, Kenyan Government brought several activities underway to reach these goals, e.g. medical service bundles including, above others, immunization for pregnant women and children under five (Ministry of

Devolution and Planning Kenya (MDPK), 2014, 17). Results of these activities are mixed but encouraging. Since 1990 the infant mortality rate reduced from 60 out of 1,000 to 52 out of 1,000 children in 2011 and aimed to be down by 22 in 2015 (MDPK, 2014, 17). Under five-mortality rate dropped from 91 out of 1,000 in 1990 to 74 out of 1,000 children in 2011 and is desired to diminish to 32 (MDPK, 2014, 17). The maternal mortality ratio decreased from 590 out of 100,000 in 1990 to 488 out of 100,000 mothers in 2009. This ratio is not satisfactory. The aim for 2015 is to reduce this ratio to 147 out of 100,000 mothers (MDPK, 2014, 18-19). The outlined situation in Kenya is a result of several conditions that are symptomatic for developing countries (see Section 1). To provide comprehensive maternal and child care there is not enough personnel. Furthermore, the personnel lack proper training to assist women in prenatal and postnatal stages. People have poor access to health facilities or lack the financial resources to do so. In fact, insufficient financial resources contribute to poor health of mother and child. This is especially severe when financial resources are too little to satisfy nutritious requirements. Sometimes mothers-to-be simply do not know which medical treatments they need in preparation for the birth of their child and are unaware of its benefits. Even if there is awareness of the use of pre- and postnatal care families are unwilling to embrace it (MDPK, 2014, 17, 20).

Seeking an opportunity to enter the African market, the German telecommunications and ICT provider Deutsche Telekom AG took the two Millennium Goals as a starting point to set up an initiative, the Telekom Challenge, aiming at the development of a solution that tackle the problems of child and maternal mortality in Kenya.

As a first step and required for the design thinking process is an appropriate team. Via means of the before mentioned initiative, Deutsche Telekom AG called on to every employee within worldwide Telekom companies to apply for this project. In the end, ten employees were selected and assembled a team. Additionally, there were two coaches from Launchlabs, a consultant agency who specializes in intrapreneurship and innovation processes (Launchlabs, 2015) and four people from the Group Transformational Change? The employees from Deutsche Telekom AG came from Monte Negro, Serbia, Hungary, and Germany. Apart from their cultural diversity, team members owned different professional skills such as engineering, strategic management, marketing, and software programming. Although combining different cultural backgrounds, working cultures, and competencies, at this point of the process no other stakeholders were involved.

For the whole project two times two weeks were scheduled on-site in Kenya. In the following, we want to provide insights from the different phases of the design thinking process presenting the course of events, goals and results of each phase.

Understand. First, the team had to gain a deeper understanding of the question “Which solutions can be developed by Deutsche Telekom to reduce child and maternal mortality in Kenya?”. Therefore, team members and coaches were briefed and provided with information material by Deutsche Telekom in advance of their stay in Kenya. Second, the team had to gain the same understanding of this question. Using the method of reframing, a method fostering people to view an issue from different perspectives and catalyse new stimuli for developing problem solutions (Kolko, 2010, 22), the original question was split up resulting in five new questions (Deutsche Telekom AG, 2013, 12):

- How to decrease the mortality rate of pregnant women?
- How to improve the education of pregnant women?
- How to improve the awareness about the health situation?

- How to increase the income of CHWs?
- How to achieve consistent patient data to improve treatment and drive women's behaviour?

Observe. The five questions that resulted from the former phase were used as a basis for the observe-phase. In order to achieve a 360-degree-perspective on the topic of child and maternal mortality in Kenya, the team split up into smaller groups and conducted research on-site. Data was collected through talks with NGOs and other health care stakeholders such as mothers and mothers-to-be, entrepreneurs of the health care market, or hospital representatives. These talks included visiting the environment of stakeholders, e.g., homes and hospitals. Thereby, the team learned about living and working conditions of mothers and mothers-to-be as well as people in the maternal health care-process chain.

Define. In order to consolidate the gained information from the former phase and connect it with the original problem, teams were split up again. Then, two fractions separately reworked the questions from the understand-phase. Rephrasing via means of cloze texts helped rendering the questions more precisely. This in turn, enabled the team to uncover the problems implied by the questions and direct subsequent efforts for developing a solution more focused. An example of these activities can be seen in Figure 2.

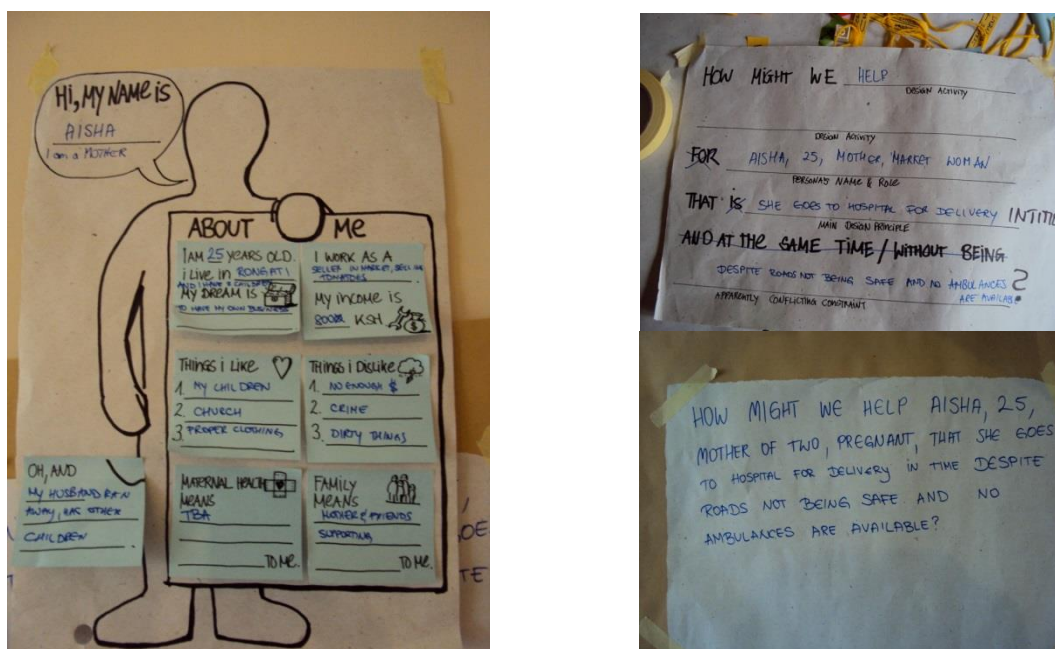
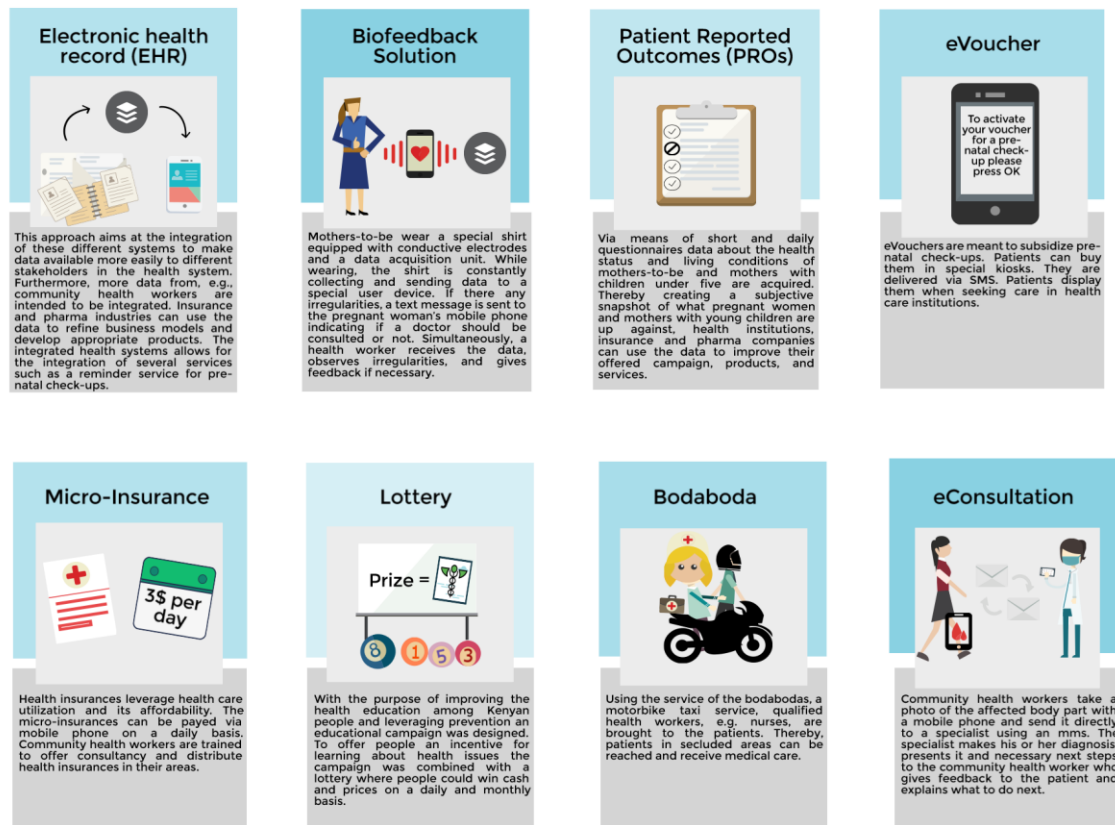


Figure 2: Reframing using templates
Source: Launchlabs, 2013

Ideate. In a matter of hours and deploying different modes of brainstorming, a creativity technique to make up ideas, eight ideas were developed. Subsequently, the team was split up again into groups of two that worked separately on the further development of the ideas. By this, all eight ideas experienced further consideration and the variety of the made up solution could be secured. It has to be mentioned, that not

all of these eight ideas were developed exclusively by the team. Instead, there were influences from the outside that brought in a single artefact or process idea that now could benefit from the design thinking methodology as such and be advanced. A brief description of the eight ideas is presented in Figure 3 (Deutsche Telekom AG, 2013, 13).

Solutions



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Figure 3: Solutions resulting from the ideate-phase
Source: Deutsche Telekom AG, 2013, 13

Prototype. Every idea was prototyped using posters, post-its, Lego bricks, and other cheap and easy to use materials. Such a prototype demonstrating the fundamental functionality of the micro-insurance is presented in Figure 4.

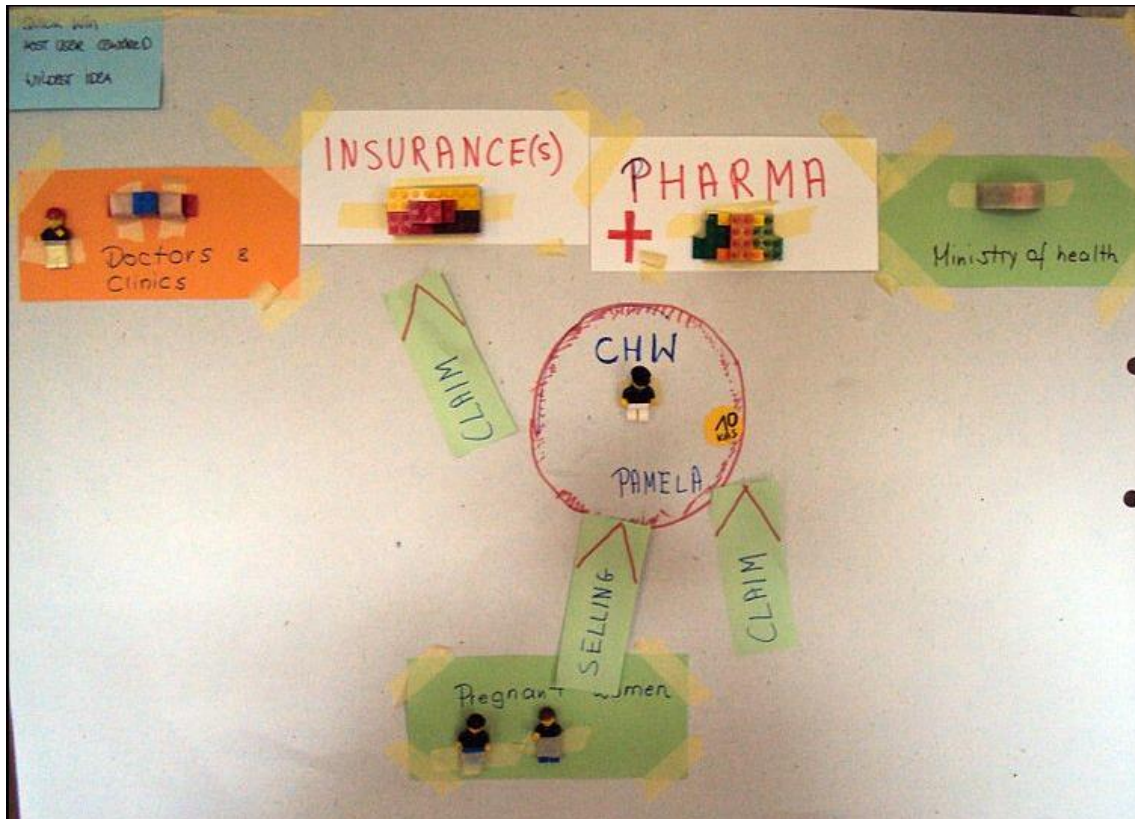


Figure 4: Micro-insurance prototype
Source: Launchlabs, 2013

Test. After setup of the first generation of prototypes, stakeholders were invited. During co-creating sessions the prototypes were presented and discussed together with stakeholders. In order to refine the solutions the next generation of prototypes was setup together with stakeholders.

Most of the time was spent on the observe-phase. Other phases were passed in a matter of hours. In sum, there were four iterations. Thereby, the solutions eVoucher, lottery, and micro-insurance were not further developed. The electronic health record was the solution favoured by Deutsche Telekom. In the end, none of the solutions was further developed by Deutsche Telekom.

5. Results

In Section 3, we defined eight criteria for evaluating design thinking methodology as promising for the development of service innovations in developing countries. Now we will prove if these criteria are satisfied. Thus, we will discuss the criteria in groups beginning with the criteria displaying the socio-human conditions.

During the observe-phase the team retrieved exhaustive information about the different health care stakeholders in Kenya. Being on-site, the team collected data during several days up to a week. A combination of action research and desk research was

employed to gain a 360-degree-perspective on the topic of child and maternal mortality.

Problems/ Issues: Apart the means of information retrieval mentioned in Section 4, the team also wished to experience face to face against what young mothers and mothers-to-be are up to. To ensure the safety of their people, Telekom provided an obligatory safety-training and set up strict safety regulations which forbid this kind of experience and limited mobility in Kenya. Without the intention to dismiss these safety concerns, one could argue that these limits cause bias in information aggregation and aggravate or, in worst case, prohibit getting a 360-degree-perspective on the problem.

Being from a big and known German telecommunications company smoothed the way for personal interviews with stakeholders. At the same time it created expectations that could not be met. For instance, entrepreneurs waited for financial sponsorships to advance their ideas. However, innovative product or service solutions at the end of their development phase were denied to enter the design thinking process because of the danger that they were developed not as a response to concrete demands and therefore not being user-centred. Furthermore, acting as representatives of such a known company created uncertainty within the team. There were discussions about interview strategies as well as the dress-code (jeans vs. suit).

Governmental institutions form another group of stakeholders. They are also included in the research activities conducted during the observe-phase. In our case study they brought in the lottery and eVouchers to foster further development of these ideas. During co-creating sessions governmental representatives gave feedback to prototyped ideas. By this, valuable information supplemented the data from the observe-phase and the transfer of tacit knowledge was stimulated.

Problem/ Issues: Again, representing a well-known company caused uncertainty for the team. As demonstrated in Figure 4, prototypes were made with post-its and LEGO. Presenting these childish appearing prototypes caused discussions between team and coaches. Telekom employees who probably stood one's ground several times during their professional life were insecure if they will be taken serious when showcasing the prototypes to governmental representatives. Coaches were ask to smooth discussions in order to keep motivation up for ongoing iterations.

Before being on-site, the Telekom team as well as the design thinking coaches received a reader provided by Deutsche Telekom. The reader contained information about the country of Kenya, the Kenyan health care system, data about child and maternal health issues, and information about the Kenyan telecommunications and health care market. Naturally, the information was selected and brought together to sketch business opportunities for Deutsche Telekom. This means, before the design thinking process started the team learned about the innovation setting and the market conditions. This information was complemented with the research conducted during the observe-phase.

Problem/ Issues: Contrary to the expectations of the whole team regarding business development, innovation activities, and telecommunications infrastructure, Kenya surprised by possessing a vivid start-up scene with people eager to create new solutions. In terms of telecommunication Kenya demonstrated having better network coverage than Germany. Furthermore, owning a mobile phone is self-evident.

General problems/ issues: The observe-phase aims at perceiving a 360-degree-perspective on a problem. An important issue in this phase of the design thinking process is to draw a final stroke. One possible way to do this is introducing time frames. Still, deciding for an adequate time frame needs gut instinct and experienced coaches.

Some team members showed difficulties leaving their usual work sphere and breaking loose from their perceived roles in their home companies. As demonstrated before, this resulted in doubts and discussions about the way things are done using design thinking methodology. Especially, when stakeholders are involved that represent important potential business partners, design thinking methodology was questioned.

6. Lessons Learned, Research Gaps, Limitations

Although the design thinking process resulted in promising ideas for reducing child and maternal mortality in Kenya, none of the solutions was realized and implemented. Deutsche Telekom abandoned the idea of entering the Kenyan market after the project. The authors are not aware of when or if Deutsche Telekom reconsiders this decision at present. Apart from strategic concerns this act of retreat reveals that design thinking does not end when prototypes are tested and adjudged to be ready for market launch. Instead, design thinking has to be integrated into everyday corporate culture so that the before mentioned role conflicts can be avoided. This does not necessarily mean that future employees change their keyboards for post-its but it encourages thinking beyond traditional structures such as business units.

There is need for actions when it comes to avoid conflicts originating in the way things are done with design thinking. Leaders of a project teams and design thinking coaches have to prepare people thoroughly to leave these doubts aside. This could be achieved by an introduction to the design thinking methodology. In doing so, people have more time to break loose from their conventional everyday business practices. Furthermore, instead of being thrown in at the deep end, learning about a method may be the best way for team members to eliminate doubts. Simply put, measures of converging the project team's expectations of the look and feel of design thinking methodology to the actual design thinking experience present a research gaps. Furthermore, we propose that the issue of documentation shall be an area of future research. Given the fact, that many design thinking case studies in literature focus on the problem solutions developed by design thinking methodology rather on the design thinking process itself, details about the process of design thinking are valuable.

7. Conclusion

In our article we responded to a research implication brought up by Berger and Nakata (2013, 1209-1210). They proposed exploring further the conditions that characterize BOP markets and find ways to respond to these conditions. Design thinking methodology is one way of response. It includes the conditions sketched in the di-

mensions of the Socio-Technical View before thinking up innovations. This means the information gathered throughout a design thinking process stimulate creating raw patterns that support seeing things from a different perspective and by this, seeing things from the eye of stakeholders.

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