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Designing value to enable chronic disease management through information and communication technology: the People Value Canvas

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Abstract

Background: The implementation of e-health strategies has been proven to be more complex and time-consuming than expected. Research points out that efficacy of the technology are not so much at stake, but its implementation (Elbert, van Os-Medendorp et al, 2014). Possible barriers named for the implementation of e-health solutions within healthcare practices are: professional resistance, organizational structures and costs. However, another obvious reason is that the technology often does not work for the health care professionals neither for the patients (Chaudhry, Phillips et al, 2007). One of the reasons mentioned is that technology overall is designed and developed for the users instead of with them.

Objective: To include the users (patients and health care professionals) in the design process, we proposed in this paper to apply the People Value Canvas to support the partnership between the person with the chronic condition and the health care professional. We presented the People Value Canvas as a methodology, which can support a person-centered approach of chronic disease management, enabled through information and communication technology.

Methods: The People Value Canvas consists of nine building blocks that described the input that has to be provided in order to gain insights in the value of a technology for its' users.

Results: We developed the People Value Canvas as a reflective, systematic tool during the design process for healthy ageing (Wildevuur, van Dijk et al, 2013). However, the tool can also be applied to fields outside of healthy ageing. We suggested it as a methodology to be used for information and communication technology-enabled person centred care for chronic disease management.

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Keywords: Design research, connected care, disease management, chronic disease, co-creation

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Introduction

Chronic non-communicable diseases are the leading cause of illness, disability and mortality in the world (WHO, 2014). As a result of population ageing and the globalization of unhealthy lifestyles, chronic diseases are expected to grow even further. This will strain the sustainability of already pressurized healthcare systems. Applying information and communication technology (ICT) in the field of healthcare - also known as e-health - is seen by governments worldwide as the solution to relieve the pressure on the healthcare system(s) and to support both patients and their clinicians in the care process (Mars and Scott, 2010; Commission, 2012; WHO, 2012). ICT used for healthcare purposes is argued to support patients to take a more active role in the care process, leading to more self-management of the patient. Specifically persons with (a) chronic condition(s) are expected by governmental bodies to increasingly use ICT in co-decision with their physician.

So, the expectations are sky-high of ICT applied within the field of healthcare. However, the implementation of e-health strategies has proved to be more complex and time-consuming than expected. Research points out that not so much the efficacy of the technology was at stake, but its implementation (Elbert, van Os-Medendorp *et al,* 2014). Possible barriers named for the implementation of e-health solutions within healthcare practices are: professional resistance, organizational structures and costs. However, another obvious reason is that the technology often does not work for the health care professionals neither for the patients (Chaudhry, Phillips *et al,* 2007). One of the reasons mentioned is that technology should be simple to use and has components for interactivity otherwise it will hardly have an impact on healthcare practice (van Gemert-Pijnen, Nijland *et al,* 2011).

To include the users (patients and health care professionals) in the design process while taken the context into account, we developed the People Value Canvas (PVC). The PVC was originally developed for the design of an ageing society (Wildevuur, van Dijk *et al,* 2013). In addition to previous usage of the PVC, we suggested in this paper to apply the canvas for a person-centred approach of chronic disease management. Person-centred care (PCC) is a term used for healthcare and social services, which reflect the individual's unique preferences, values and needs, identified and agreed upon in partnership with the physician (Dictionary, 2011). The needs and narratives of patients are the base for a person-centred approach of care. Within a person-centred approach of health and care, the person is no longer a passive target of a medical intervention (patient), but is actively involved in his or her care. Person-centred care is seen as a promising way to lead to chronic disease self-management (Ekman, Swedberg *et al,* 2011). To conceptualize a person-centred care approach in designing technology for chronic disease management, we proposed the People Value Canvas (PVC) as a tool.

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People Value Canvas

Since hardly any ICT-intervention for chronic disease management could be considered person-centred (Wildevuur SE, 2015), we believed that PVC could be a tool and methodology to support the design of interventions for managing chronic conditions. Patients with chronic conditions make day-to-day decisions about their health (Bodenheimer, Lorig *et al,* 2002). Patients become partners in the management of their condition, contributing to almost all decisions or action levels (Holman and Lorig, 2000). The partnership between the health care professional and the patient shifted from a more passive to a more active patient. What are the potential consequences for the envisioned intervention, when taking this changing partnership into account?

To be able to create value for ICT-interventions and to design to support chronic disease management, designers need to explore, validate and reflect upon the different design choices and their intended impact. This demands methodologies for understanding needs and motivations of the users and exploring solutions (Van Dijk D, 2011). There isn't one single way to organise these tasks. Nevertheless, it may be helpful to learn from frameworks that offer a basic recipe consisting of checklists and a structure for the work to be done (Desmet and Hekkert, 2007; Sanders L, 2012).

A 'canvas', such as the popular Business Model Canvas, proved to be a useful tool in analysing innovation processes (Osterwalder and Pigneur, 2010). However, this canvas lacked possibilities to gain detailed knowledge about people using an innovative intervention. To look at ICT-development from a user-driven point of view, we developed the People Value Canvas (see: Figure 1), which supports the value of its user (Wildevuur SE, 2013).

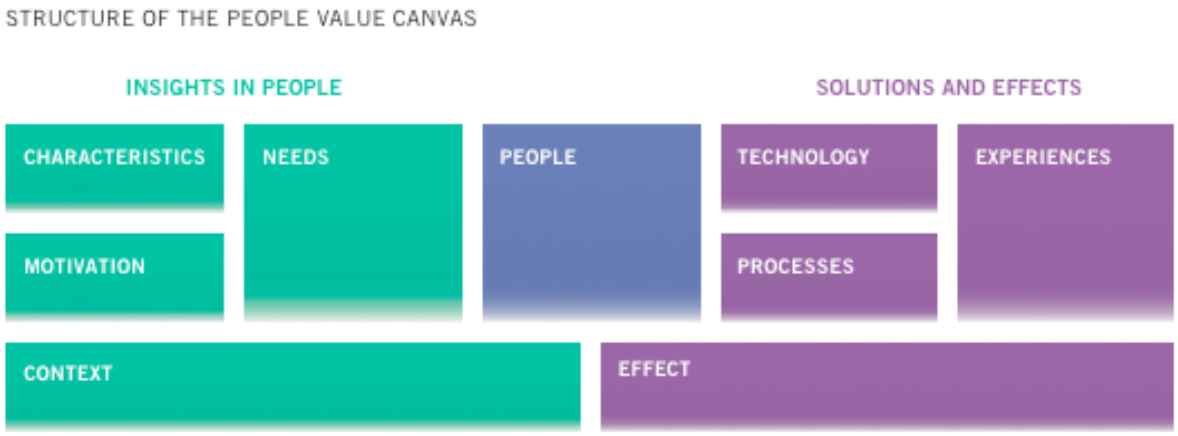

Figure 1: The People Value Canvas

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Methods

> "Words matter. Talk about people: not customers, not consumers, not users."
>
> Don Norman, researcher in the field of cognitive science, design and usability

The People Value Canvas consists of nine building blocks, which have to be filled in when developing new concepts. The blocks described the input that was provided in order to establish the value proposition for the user. The building blocks are intrinsically linked and have to be revisited iteratively. The canvas was divided into a 'insights in people' part and 'solution and effects' part of the intervention. The central idea behind the canvas was that a product or service had added value only if it satisfied user needs and fits user motivations. On the one hand, the canvas helped to structure users' needs and preferences, the context and effect. On the other hand, it described how a proposed intervention would meet user-driven criteria. The descriptions provided below describe what needs to be considered during concept development in order to reflect upon value of the technology.

User Insights

In order to be able to design technology to support chronic disease management, we needed insight into the people (patient, health care professionals, informal carers) for whom we were designing (see: figure 2).

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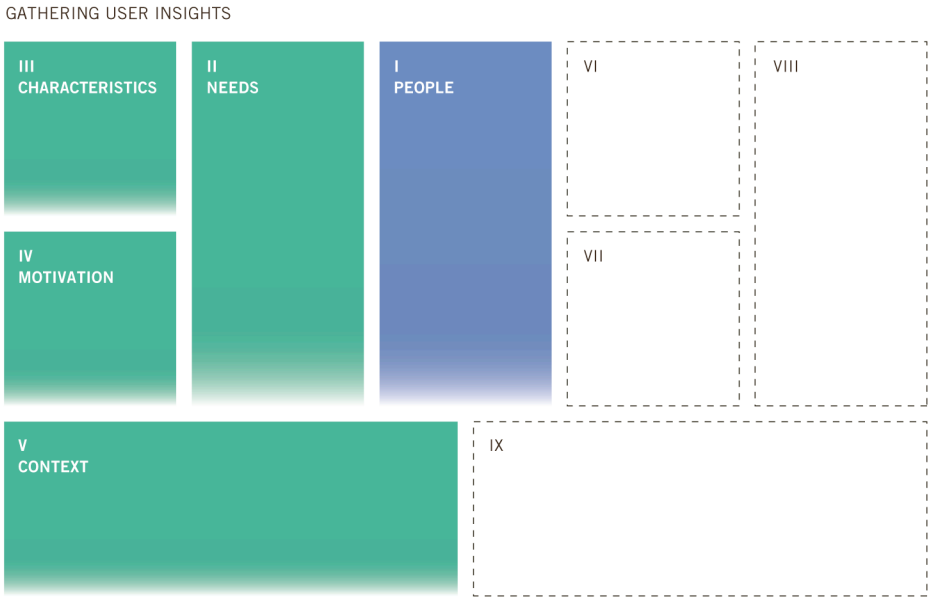

Figure 2: Gather user insights

What were their characteristics, needs and motivations of the users? The left-hand side of the canvas showed this. With these building blocks we can 'check' if we took the users' needs into account when developing the intervention. This information can add to the knowledge of the context, in which the ICT would be used for chronic disease management.

Building block I: People

Who are you designing for? What are the key variables within the target group in relation to the opportunity or challenge you are pursuing? One of the most common flaws in innovation is the lack of adequate segmentation. People take centre stage in the people value canvas. To really understand your target audience they need to be regarded as a source not only for research, but also for inspiration, co-creation, and prototyping. A clear demarcation of the people you are designing for makes it possible to initiate multifaceted design research that provides deeper insights into needs, motivation, and characteristics. In case of chronic disease management the people include: persons with chronic conditions, his health care professional(s), family members, partner, informal carers and so forth.

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Building block II: Needs

What are the most urgent or specific functional, social and emotional needs you aim to address? People have all sorts of needs. People need input to take informed decisions. There are several models we could use to look at needs, such as Maslow's Hierarchy of Needs (Maslow and Lowry, 1968), and McClelland's Human Motivation Theory (McClelland, 1987). Nonetheless, keep in mind that there might be conflicting needs (Ozkaramanli and Desmet, 2012). Within chronic disease management different needs could be distinguished such as the need for: information, transparency, trust, security, social support or medical consult.

Building block III: Characteristics

What are the attributes of the people for whom we are designing? In what ways are they connected? What are their lives like? What kind of relationship do they have with others and with technology?

Building block IV: Motivation

Motivation is what drives a person to behave in a certain way, and is in that sense different or complementary to the needs: motivation is the crucial component in setting and reaching goals. Motivations shed light on individual aspirations, and what people value. Motivation may be rooted in a basic need to minimize physical pain and maximize pleasure. A healthy lifestyle is of importance for diabetes patients, for example. But what is their motivation to manage their disease?

Building block V: Context

In which context does the intervention need to land? The way a person approaches, uses and experiences the technology needs to be seen in a broader context, which includes not just the user and the product or service, but also other contextual factors (time and place, and so on). Important contextual parameters include people's life circumstances, such as income, geography (urban or rural), and distance from family members, but also the location where the technology is used, or where a person's comfort zone is.

Choice of technology

The right-hand side of the People Value Canvas describes the choice of technology and its consequences for and effect on the target groups (see: figure 3).

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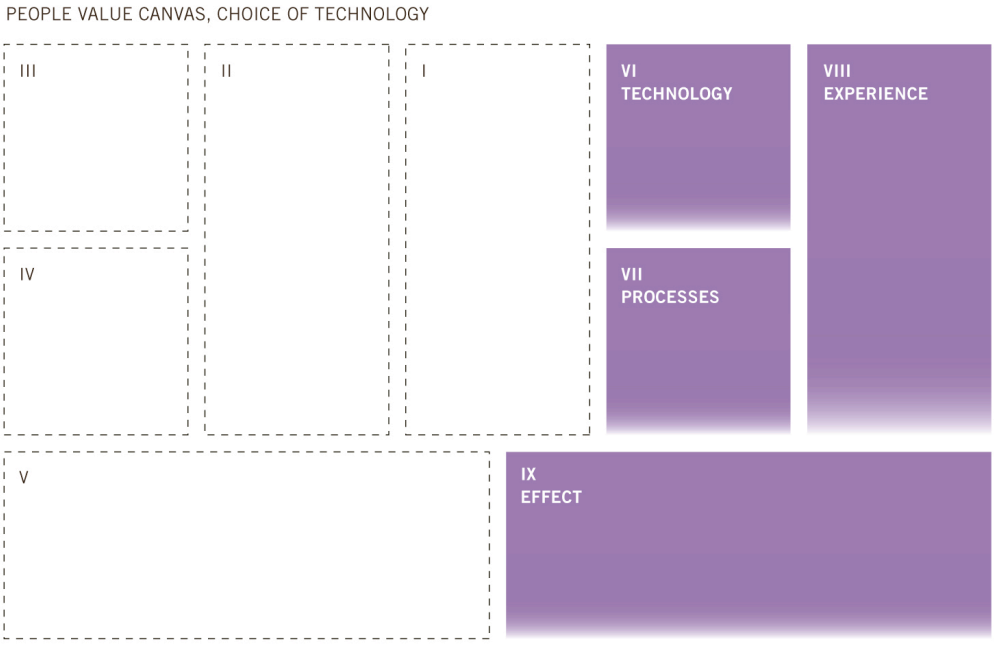

Figure 3: Choice of technology

Technology is not neutral; it has its own intrinsic effects and invites certain kinds of use. The canvas is not only intended to describe the user experience at any given moment, but also to formulate ideas about the long- term effects. What is the result of the intervention? What has its (projected) impact been on the behaviour or wellbeing of the user?

Building block VI: Technology

When you want to put people and experiences at the centre of developing solutions supported through technology, you need to be explicit about your technological development. Think of how this particular technology will take the users into account and specifically support the management of the chronic condition. A good interface activates people, enables them to take action themselves, empowers them, and offers a context for the partnership between the patient and the health care professional for chronic disease management.

Building block VII: Processes

Offering an intervention to support chronic disease management means paying attention to the entire ecosystem within which the application is located. Moreover, interactions with the

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intervention usually involve multiple touch points, with the patients, the health care professional, family, informal carers and so forth. The answer to building block 'Process' is a reflection on the potential challenges and desired touch points related to the intervention you envisioned – some visible to the user, some very much in the background.

Building block VIII: Experience

What is the quality of your intervention? How is it connected to the user's daily life, routines and flow? Intuitive interfaces, playful learning and embodied interaction can help to create experiences. The answer to building block 'Experience' is a vivid description of the nature of the experience you design from the perspective of the user.

Building block IX: Effect

What will be the long-term impact of your intervention on the user's own narrative? How will the intervention contribute to their potential or relations?

Findings

Since there did not seem to be a tool which mapped insights in a structured way from the user value perspective, the urge was felt to construct such a tool: the People Value Canvas. The central idea behind the canvas was that a product or service has added value only when it satisfied user needs and fits user motivations, and when the context is taken into account. We developed the People Value Canvas as a reflective, systematic tool and methodology during the design process for healthy ageing (Wildevuur, van Dijk *et al,* 2013). The tool proved valuable in discussing new concepts among the stakeholders involved (Wildevuur SE, 2011) since it gave structure to the design process. On the one hand, the canvas helped to structure user insights (needs, context and so on) and on the other hand proposed how an intervention could meet user-driven criteria. However, the tool could also be applied to fields outside of healthy ageing.

In this paper we suggested to apply PVC as a reflective, systematic methodology during the design process of technology to support chronic disease management in a person-centred care manner. The use of PVC could give insights in barriers such as the resistance of e-health interventions by both the health care professionals and patients. Additional research will help to understand the preconditions of designing ICT to support chronic disease management in a person-centred care way.

Conclusion

The development of e-health technology is overall still technology-driven and developed for and not with its users. Hardly any ICT-intervention for the support of chronic disease management

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turned out to be person-centered. We believe that the People Value Canvas adds to the sparse methods to support the design and development of ICT-interventions for a person-centered approach of chronic disease management. Further research is required to study how PVC as a tool could support design with the users in the growing field of chronic disease management.

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