Main requirements of a Health and Wellbeing Platform: findings from four focus group discussions

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Abstract

Supporting the ageing population is a worldwide challenge as it causes a huge tension on societies, regarding to healthcare budgets, resources, pensions and social security systems. To support people 'age in place' we propose a digital matchmaking platform for health and wellbeing. Nevertheless, what should be the main purpose of such a platform is unclear. In this paper, we present the main requirements of a health and wellbeing platform based on four focus group discussions with 28 stakeholders and potential end-users. The findings show that the young elderly (55 - 75) can be considered as the main target group for the platform. Accordingly, we found that the most beneficial requirements are related to: contact with others, matchmaking for smart living products and services, and information about local activities. Our research adds design knowledge to service platform literature and exposes the main requirements of a health and wellbeing platform, which are of value for practitioners in the field.

Keywords

design science, matchmaking platform, health and wellbeing, smart living, focus groups, personas

1. INTRODUCTION

Although, worldwide several health and wellbeing products and services are developed to support people to live comfortable and independently in their home environment, smart living services (Nikayin et al. 2013), aimed at people living at home, are not yet widely adopted (Peine 2009; Solaimani et al. 2011; Wichert et al. 2012). A hindering factor is that users are not aware of possible solutions or where to find them, which can be explained by 1) the tools are missing for stakeholders to create awareness among end-users about existing solutions and 2) the highly fragmented market hinders end-users to find products and services that they need, and 3) the predominantly technological focus of service providers makes it difficult to understand how services fit end-user needs. Accordingly, a possible approach to solve issues like awareness, fragmentation and promotion, is to create a service platform (i.e., a social infrastructure) that connects providers and users of smart living products and services. Designing such platforms is challenging as multiple stakeholders need to be satisfied and start-up problems need to be overcome. According to 59 interviewees in an earlier phase of this research (Keijzer-Broers et al. 2014), the basic features of a health and wellbeing platform, can be clustered as 1) An **online community** for contact, solutions, social wellbeing, interaction with the neighborhood and a digital marketplace for applications (consumer to consumer). The need for this functionality is driven by the need for social cohesion, and 2) An **information exchange platform** about smart living between providers and end-users (business to consumer). Driven by the need for matchmaking between service providers and end-users, and 3) A **portal** for bundled services and solutions (business to consumer). Driven by the one-stop-shop philosophy for 'ageing in place', were end-users can find all relevant applications in the smart living domain, but also can create a personal profile and 4) An **intervention instrument** for the municipality (government to consumer) to get in contact with citizens about needs for services and questions about health and wellbeing and to get insight in transaction cost aspects related to new regulations in the Netherlands (i.e., AWBZ and WMO legislation). In this paper, we evaluate and validate the basic features and requirements of a digital health and wellbeing platform in four focus group meetings. This evaluation provides the basis for future design cycles in which the development and actual implementation of a platform is foreseen (see figure 1). From a theoretical perspective, most theory on service platforms is related to ex-post studies and there is a lack of knowledge on how service platforms should be designed and implemented. Designing service platforms is different from designing other IS artifacts. A service platform is an IT system that enables, shapes and supports processes needed for delivering products and services and for improving the value proposition (Evans et al. 2006). Service platforms come in various ways, but typically consist of features such as search functionality, payment administration, authentication, security, data access and identity management. In this paper, we contribute to design knowledge and create a better understanding about platform complexity (Tilson et al. 2012) and platform functions in the health care context. From a practical perspective, our study sheds light on a possible solution to support people

age in place. This is important as we witness several initiatives such as 'active ageing', or 'independent living' promoted by the World Health Organization (2002) and the European Union, which are aimed to encourage healthy ageing and independent living while optimizing healthcare processes. We position our research within the design science research paradigm (Livari 2007; Van Aken 2004), a problem solving paradigm (Simon 1996) that seeks to extend the boundaries of human and organizational capabilities by creating new and innovative artifacts.

2. METHOD

2.1. Design science research

Design science research attempts to solve a specific problem and to generate and empirically test a design theory that can be reused in solving a class of related problems. We adopt a specific design science research method called Action Design Research (ADR) after a term first coined by Livari (2007). ADR provides explicit guidance for combining building, intervention, and evaluation in a concerted research effort and is a study of change. ADR contains two basic activities: building an artifact for a specific purpose and evaluation on performance of that artifact. We adopt ADR because it has a dual mission: 1) to make theoretical contributions and 2) to assist solving current and anticipated problems of practitioners (Sein et al. 2011). We use this approach in conducting our research as it provides a scientific research framework for designing a service platform, but taking into account that designing the platform is an iterative and sometimes 'messy' process. Previous studies show that the proliferation of platforms depends on several criteria such as satisfying multiple sides of the market (Boudreau et al. 2009), governing relationships with third party service providers (Tilson et al. 2010) and maintaining a degree of openness in order to allow generativity (West 2003). Since trust in a platform and building up reputation are also important success factors (Gawer et al. 2008), the process in which a platform is designed and stakeholders are involved is far from trivial. In summary, existing knowledge on platforms is merely based on ex post studies of successful cases and there is a lack of knowledge on the design of platforms. Therefore, the aim of this paper is to contribute to design knowledge on platform eco-systems to create a better understanding, through the specific case of designing a platform for health and wellbeing. As a framework we extend the design cycle of Kuechler et al. (2008), which divides design science research in five steps.

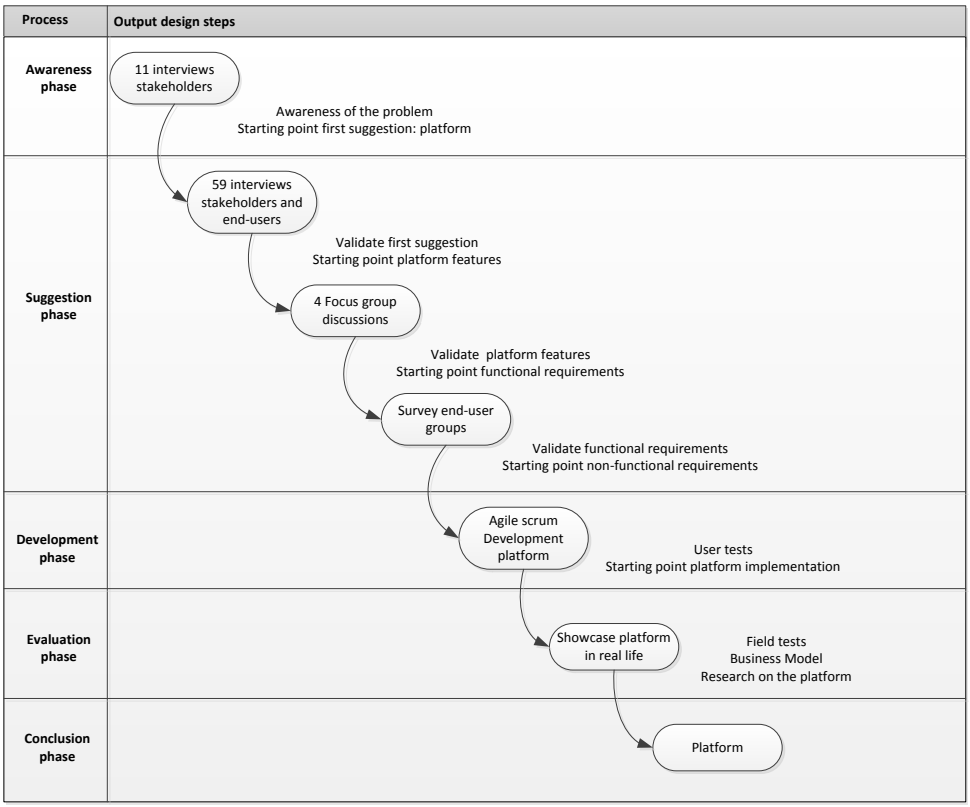


Figure 1. Design cycle process

Figure 1 comprises the stages of problem awareness, suggested solution, develop the artefact, implementation and evaluation as an overview of the patterns (i.e., generalized system design elements) of the platform design. Although in the design cycle of Kuechler and Vaishnavi there is just one occasion to measure the performance of the design (i.e. evaluation phase), we added *used methods* and *validation steps* to provide small iterative steps within the design cycle and to discover possible flaws in an early stage of the design science process.

2.2. Focus groups

To evaluate the first design cycle (i.e. suggestion phase) and in order to explore different requirements for the platform, we used four rounds of focus group meetings, with in total 28 participants as an iterative step in our design cycle. Focus groups can be used to gather additional information as an adjunct to quantitative data collection methods, and is part of the data collection process. We used this mixed data collection methods to increase validity of our findings (Creswell et al. 2007). We can define a focus group as 'a carefully planned discussion, designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment' (Krueger 1994) [p.6]. Focus groups are informal group discussions among a small group of individuals in which different views and experiences are explored through group interaction (Litosseliti 2003). They can be considered as group interviews, whose purpose is to collect qualitative data. However, focus groups rely on the 'explicit' use of the group interaction to produce data and insights that would be less accessible without the interaction found in a group (McGraw et al. 1988). In order to elicit and specify user requirements, focus group interviews (Caplan 1990) are a feasible option and the use of multiple experts in a group setting is recognized as a viable tool for knowledge acquisition. Potential advantages of group knowledge acquisition over individual sessions include 1) groups can provide a broader range of skills and knowledge, and 2) groups can provide more effective divisions of labor, and 3) groups can legitimize a result (Massey et al. 1991). Focus group interviews, allow groups of individuals to bring forward and discuss, problems and different solutions to those problems while being guided by a moderator (Caplan 1990). The groups need to be large enough to generate rich discussion and the moderator's goal is to generate a maximum number of different ideas and opinions from as many different people in the time allotted. A group session is useful for dealing with complex, unstructured problems in which the actors have incompatible interests, diverging areas of knowledge, and multiple backgrounds and is more productive than single interviews (van Herik et al. 2000). A disadvantage of a focus group is that participants may be hesitant to express their thoughts if they think it opposes the views of other participants. In this research we use the focus group method as a secondary research goal to validate the basic platform features in the suggestion phase (i.e., second design step) of the design cycle (see figure 1) and to elicit the first functional and non-functional requirements of the platform. An explicit goal of the sessions is to evaluate the four identified features (i.e., online community, information exchange platform, portal and intervention instrument) of a platform for health and wellbeing, elicited by stakeholders (i.e., first design step of the design cycle) and to shape the outline of the tentative design of the platform. The outcomes of the focus groups will be used as input for a survey with different end-user groups (i.e., elderly and patient bonds).

2.2 Selection focus group participants

We arranged two rounds of focus group meetings. Every round was divided in a pre-selected and a more opportunity driven session with healthcare experts (table 1). The rationale behind those two rounds is to get input from a broad perspective of potential end-users (i.e., practitioners, researchers and end-users) that are 1) in a different life stage (i.e., 25 until 70 years old) and 2) have no particular health conditions, 3) familiar with health and wellbeing as a topic, either as part of their profession or as a (informal) caretaker, and 4) represent one of the three archetypes of potential platform users (i.e., government, care provider and citizen).

Table 1. Two focus group rounds

Focus group 1a			
1	Female	Administrator healthcare Arts en Zorg	45+
2	Female	Director Informal caretakers SWMD	40+
3	Female	Project leader Informal caretakers/volunteers 'Tympaan'	40+
4	Male	Retired/potential end-user	65+
5	Male	General Practitioner	60+
6	Male	Consultant and advisor government	60+
7	Male	Strategist KPN/advisor 'good life'	55+

Focus group 1b			
8	Male	Senior manager Age-UK	50+
9	Male	Director Health and Design Institute – UK	50+
10	Female	Senior manager Coventry University – UK	30+
11	Female	Lecturer Coventry University – UK	40+
12	Female	PhD Researcher University of Applied Science Utrecht- NL	30+

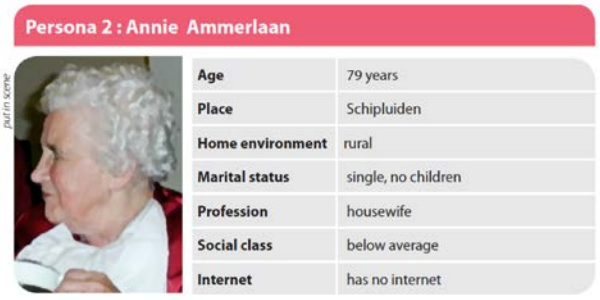
Focus group 2a			
13	Male	Retired (emeritus professor)	65+
14	Male	Financial consultant	60+
15	Male	Senior consultant ICT	35+
16	Male	Director Homecare organization	45+
17	Male	Retired (engineer)	65+
18	Male	Retired (lecturer)	65+
19	Female	Care and horeca professional	50+
20	Female	Care and nutrition professional	50+

Focus group 2b			
21	Male	Manager Elderly projects– NL	60+
22	Male	Manager Mextal/Viedome – NL	55 +
23	Male	Director HOIP – UK	55+
24	Male	Consultant Actimage – LUX	25+
25	Male	Project manager IROM – RO	55+
26	Male	Project manager TP Vision – NL	30+
27	Male	Consultant Singular Logic – RO	30+
28	Male	Consultant BRE – UK	50+

The candidates of focus group *1a* are pre-selected participants based on different gender, education level, background and age group. The candidates of focus group *1b* are not pre-selected, but are all healthcare professionals (both business and academia) from UK and the Netherlands and were participating in a workshop during an exchange meeting between both countries. These experts are familiar with the ageing population from a practical and a research point of view. The candidates of focus group *2a* are again pre-selected as potential end-users of the platform (i.e., young elderly 55 – 75 and/or voluntary caretakers). The candidates of focus group *2b* are project partners from a European AAL project from different countries (UK, Romania, Luxembourg, the Netherlands) and are all working as an intermediary in the healthcare sector (i.e., ICT enablers, technical providers of healthcare systems and consultants).

2.3. Personas

During the focus group sessions we made use of 'personas' as a design tool. A persona is an archetypal representation of a user. Alan Cooper solidified the idea into a design philosophy (Cooper 1999) and designers have been using it to improve their user experience ever since. Personas are fictional characters that serve as a reminder of who our users are. We created three user archetypes to represent the main target population for the platform an every persona has its own story to tell. The more believable the story the better and the more accurate the representation, the more likely our decisions will reflect the user's needs. Personas can be valuable to complement a range of quantitative and qualitative usability methods, to amplify the effectiveness of other methods. Personas are related to the theory of intentionality: how we think about something changes depending on which type of agency we think is affecting it: physical, design, or intentional (Dennett 1989). With people we assume intentional agency and we seek to understand their beliefs and goals in order to predict what they will do to satisfy these goals. Our persona's story consists of a name and photo, title, byline, and, most importantly, his or her goals and frustrations (i.e., pain points). Our job, with the intended service platform, is to meet their goals and solve their frustrations. Ultimately, personas help us make the user's needs more memorable throughout the process. The eight representations are divided in three archetypes: citizens, providers and representatives of the municipality, according to the main features, and they will be used during the whole process of the research. The personas have a different gender, age, background, health condition and culture and are more or less familiar with the digital world and each character is developed in realistic detail.



Persona 2 is single and isolated.

Persona 3 takes care of his partner with dementia.

Persona 4 : Ria van Marrewijk

Age	55 year
Place of birth	Den Hoorn
Home environment	terraced house
Marital status	husband and 3 children at home
Profession	part time care giver at Buurtzorg
Social class	average income
Internet use	private

Persona 4 takes care of relatives (sandwich generation).

Persona 8 : Hakkan Bitez

Age	55 years
Place of birth	Delft
Home environment	poor neighbourhood
Marital status	married, 6 children, 1 living away
Profession	unemployed
Social class	below average
Internet use	private (with help of the children)

Persona 8 is foreigner and unemployed.

Persona 1 : Frans Berkhout

Age	49 years
Place of birth	Schipluiden
Home environment	residential area
Marital status	married, 2 children
Profession	home care products supplier
Social class	average income
Internet use	work and private

Persona 1 represents a product provider.

Persona 5 : Ellen van de Windt

Age	47 years
Place of birth	Delft
Home environment	city center
Marital status	married, 3 children
Profession	coördinator Foundation Welfare Elderly
Social class	average income
Internet use	work and private

Persona 5 represents service provider for healthcare.

Persona 6 : Anton Gielissen

Age	62 years
Place of birth	Delft
Home environment	terraced house
Marital status	single, 2 children living away
Profession	civil servant Social Affairs Delft
Social class	more than average
Internet use	work and private

Persona 6 represents the department of social affairs.

Persona 7 : Petra de Kort

Age	25 years
Place of birth	Den Haag
Home environment	city center
Marital status	living together with a boy-friend
Profession	advisor WMO office Midden Delfland
Social class	average income
Internet use	work and private

Persona 7 represents the WMO desk at a municipality.

Although, the possible combinations to describe a persona are countless, we based our personas on 12 face-to-face interviews with possible end-users from different backgrounds and with different wishes. After the interviews the personas are discussed and refined in three meetings with four informants in the healthcare domain. We anonymized the personas by using fictional names and pictures. Four personas represent citizens (i.e., 2, 3, 4 and 8). Two personas (i.e., 1 and 5) represent the service and product providers and two personas (i.e., 6 and 7) are representatives from a municipality. The personas were used as fictitious users and can function both as 1) a vehicle to create empathy and identification, and 2) a storage for information and 3) to support a holistic understanding of the user. Due to limited space of this paper only the headers of the personas are added, while the rest of their story is left out. The personas are used during the focus group meeting to figure out if we really understand the potential customers of the platform. This is a way of looking at the life of a persona throughout the project and beyond, to ensure they are being brought into an environment that can nurture their growth. Then, throughout their adulthood, the personas help us make decisions and grow with the maturity of the project.

3. RESULTS

The focus group sessions took approximately two to three hours, led by the same moderator and were audiotaped and transcribed for analysis. The degree of structure imposed on the discussion, as well as the composition of the group, is a function of the objective of the session. The main goal of the moderator is process facilitation. According to content-oriented research the moderator stimulates the interaction process of the focus group members, to gain specificity, range and depth. There was low content control, but the moderator made sure that all members

participated and some were tempered and others motivated to take part in the conversation. The focus group meetings included a presentation, a Q&A session. Three to four questions were posed, followed by discussions. All items are measured using a 7-point Likert scale.

The first question was: *What should be the main purpose of a health and wellbeing platform?*

Because of time restrictions this question is only posed in the first two focus group meetings. According to the 12 focus group members of the first two focus group meetings all combinations of platform features (i.e., online community, information exchange platform, portal and intervention instrument) are possible, because the suggested features are more or less related to each other. Some are more valuable in the start of the platform than others, and at the end of the first two meetings, participants agreed on the overall suggestion to start with a small transition platform and scale up if necessary. The most supported feature was a portal ($\bar{x}$ 6.2 and SD = 1.0), but seven participants (i.e., #2, #7, #8, #9, #10, #11 en #12) suggested to combine the information exchange platform and the portal, and graded both as equal important. The rationale behind the suggestion is that both platform features support 'business to consumer' and can be used interchangeably. As an extra suggestion, three participants (i.e., #5, #6 and #7) came up with a specific intervention feature for district nurses, acting from a community center for elderly. The UK participants (i.e., #8, #9, #10 and #11) were not used to contemplate about an intervention feature for municipalities, because the municipalities in the UK are not directly involved in healthcare. Next to that, two participants (i.e., #1 and #6) suggest a kind of follow-up system (i.e., SOS) for elderly. According to the participants it is necessary that all stakeholders (i.e., government, providers and end-users) collaborate to help people stay at home as long as possible and a service platform is a viable tool to help the stakeholders interact with each other. Although an intervention instrument is the least important according to participants #2, #8 #9, #11 and the participants are more divided about this feature ($\bar{x}$ 4 and SD 1.7), after discussion the Dutch participants agreed that a platform could benefit the municipalities to stay in direct contact with the citizens. The rationale behind this assumption is the changed Dutch health care legislation from 2015 onwards and the new tasks that the municipalities are facing according to health care.

The second question was: *Who would benefit from the platform?* See table 2.

Table 2. Potential users of the platform (1 = absolutely not and 7 = absolutely)

	Mean ($\bar{X}$)	Standard Deviation (SD)
Young elderly (55 – 75)	6.43	0.63
Service providers	6.36	0.91
People with physical limitations	6.29	0.90
People with chronic conditions	6.21	0.92
Product providers	6.18	0.90
Voluntary caretakers	6.07	1.11
Elderly (75+)	6.07	1.22
Citizens in general	5.96	1.04
Volunteers	5.93	1.15
Government (municipality)	5.68	1.63
People with mental limitations	5.21	1.50

All the participants (n = 28) have a strong believe about the usefulness of the platform for a broad range of potential end-users (see table 2). The highest scores are related to **young elderly** in the age of 55 to 75 ($\bar{x}$ 6.43 and SD 0.63) and **people with physical limitations** ($\bar{x}$ 6.29 and SD 0.90) but also for **product** ($\bar{x}$ 6.18 and SD 0.90) **and service providers** ($\bar{x}$ 6.36 and SD 0.91). Some of the participants (i.e., #12, #14, #20, #27) are not convinced about the usefulness of the platform for **elderly** (i.e., 75+), because they are not that tech-savvy ($\bar{x}$ 6.07 and SD 1.22). According to nine participants (i.e., #5, #7, #8, #13, #14, #17, #18, #22, #23), **people with mental limitations** are excluded as potential end-users ($\bar{x}$ 5.21 and SD 1.50), unless they were under supervision. The usefulness of the platform for this group of people is related to the content on the platform and the level of mental problems of the person. The main target group for the platform is foreseen for the young elderly (i.e., 55 to 75 years old). According to the participants, the rationale behind this assumption is that 1) this group of people is used to live a comfortable life and want to continue their lifestyle in the (near) future, and 2) they take care of their relatives and can function as an intermediary between the platform and their relatives.

The third question was: *Which requirements are beneficial according to you or someone closely related to you?* See table 3 (participants refer to themselves) and table 4 (participants refer to their parents or grandparents).

During the focus group meetings we discussed 13 basic requirements for the digital platform. Although the average score for all requirements was between beneficial and very beneficial ($\bar{x}$ between 4.23 and 6.39), there is a difference

in perception if the participants (n = 27) take themselves into account for the platform (n = 13) or if they refer to parents or grandparents (n = 14). For instance if the younger participants (age < 55) took themselves into account, it was clear that the participant was not ready to use a matchmaking platform for health and wellbeing. The rationale behind this assumption is that younger participants do not see themselves as the target group (yet). Nevertheless, all participants in this age group were pretty sure that a health and wellbeing platform could help them in the future. Participants that refer to themselves as potential users for the platform mentioned **information about local activities (**$\bar{x}$ 6.39), **contact with others (**$\bar{x}$ 6.08), and **integration of local platforms** (**(**$\bar{x}$ 6.08) as most beneficial requirements. Also the **integration of local (**$\bar{x}$ 6.08) **and national platforms (**$\bar{x}$ 5.46) for health and wellbeing in the platform is pointed out as beneficial, mainly to avoid that developers 'invent the wheel' again. Most participants prefer the integration of existing, trustworthy and well-known web applications for health and wellbeing. Participants below 55 (n = 6) that refer to themselves, have no specific need for products and services that are related to healthcare, like **Health Products** (e.g., stair elevator, nursing aids), **Wellbeing Products** (e.g., entertainment, serious games), **Wellbeing services** (e.g., grocery, meal, cooking) and **Health services** (e.g., domestic help, personal care) or a **Marketplace** (i.e. local supply and demand) to share specific health and wellbeing goods (i.e., wheelchair, walker) with others. Instead, this age group appreciates the **Domestic products** (e.g., home automation, security) and **Domestic services** (e.g., installer, contractor, gardener), by means that it can directly add something to their comfortable lifestyle.

Table 3. Requirements of the platform according to the participant itself (n =13)

	Mean ($\bar{X}$)	Standard Deviation (SD)
Information about local activities	6.39	0.87
Integration local platforms	6.08	1.12
Contact with others	6.08	1.44
Health services	5.92	1.38
Wellbeing products	5.62	1.66
Information ageing in place	5.54	1.45
Integration national platforms	5.46	1.66
Domestic products	5.39	1.80
Health products	5.23	1.96
Wellbeing services	5.15	2.19
Contact with end user groups	5.07	1.93
Domestic services	4.85	2.15
Marketplace	4.23	1.92

Table 4. Requirements of the platform referring to parents or grandparents (n = 14)

	Mean ($\bar{X}$)	Standard Deviation (SD)
Wellbeing products	6.07	0.92
Wellbeing services	6.07	1.00
Contact with others	6.00	0.88
Health services	5.93	1.14
Health products	5.71	1.20
Domestic services	5.64	1.50
Information about local activities	5.43	1.50
Contact with end user groups	5.29	1.38
Domestic products	4,93	1.13
Integration local platforms	4.86	1.88
Integration national platforms	4.71	1.68
Marketplace	4.71	1.68
Information ageing in place	4.64	1.34

While most of the participants agreed on the fact that the platform would be beneficial for elderly, some of them argued that their older relatives (i.e., parents or other family members) are not that tech-savvy and they need help from 1) their relatives or other voluntary caretakers, 2) a kind of district nurse 3) someone from the municipality, to find their way. They argue that a platform, that follows the one-stop-shop principle, can unburden family members in figuring out how to support their relatives in a sufficient way. As one participant poses: *"Separate the question of benefit and likelihood of actual using the platform: who benefits (the elderly) is probably not the user (intermediary) of the platform"*. Participants that take their (grand) parents into account for the platform (n = 14), think that **Wellbeing products and services** (both 6.07) and **Contact with others** ($\bar{x}$ 6.00) will be most beneficial. And next to that **Healthcare related services (**$\bar{x}$ 5.93) **and products (**$\bar{x}$ 5,71). On the other hand, **Information about ageing in place** ($\bar{x}$ 4.64) and the **Marketplace** (i.e., supply and demand) to share goods with others ($\bar{x}$ 4.71) are seen as the least beneficial options for the elderly. Nevertheless, 11 participants mentioned that they will use the platform themselves to help their (grand) parents in finding the right information. These participants are referring to people aged over 75 that are not tech-savvy and need support with online searching for smart living products and services. Suggestions from the participants like: *"Match with young elderly that are looking for solutions for the 3th generation"* and *"Think about alternative ways for people to access the platform, for example through an*

intermediary like relatives", indicates that the elderly need some sort of extra support to make sure an digital platform is a suitable solution for this specific target group.

During the discussion the participants mentioned a diversity of non-functional requirements for the digital platform. The clustered suggestions are: the platform has to be easy to use (*n* = 21) and accessible for everyone (*n* = 20). With updated and complete information (*n* = 20). The platform has to unburden the target group (*n* = 19) and profiling has to be one of the features (*n* = 18). Next to that the platform has to be trustworthy (*n* = 12) and secured (e.g. privacy) (*n* = 12). To reach a large target group the platform has to be multi lingual (*n* = 11) and follows the one-stop shop principle (*n* = 9). A local supply and demand marketplace will be beneficial (*n* = 9) but *"Timely match demand and supply with trustful parties is key"*. The platform has to be independent (*n* = 8). Next to that the response time of the platform is important (*n* = 5), also interaction and feedback (*n* = 4), and there has to be a control function for the end-user (*n* = 3). Extra suggestions made by the participants were: *"The platform has to have a preventive effect" and "Make sure the platform really unburdens people"*. After that, the participants discussed possible pitfalls to take into account, while developing a health and wellbeing platform. The most mentioned limitations for the platform are: the overall complexity (e.g. information overload, to broad) (*n* = 17); the illiteracy of the target group (*n* =16); a technology driven instead of human driven solution (*n* = 14); the missing awareness of the target groups (*n* = 14). Next to that was mentioned: the complex governance of the platform (*n* = 13), that end-users will be to skeptical to use the platform (*n* = 10); there are no or not enough investors (*n* = 8) and ownership of the platform in relation to independency is not clear (*n* = 6). Some of participants commented: *"The platform has to be human driven and not technology driven*" and *"Make sure that not the 'wrong' agencies like care insurers pick up the idea and develop the platform for the wrong reason"* and *"How to govern such a platform, with so many stakeholders"*.

The fourth question was: *Which requirements are beneficial according to a specific persona?* See table 5.

***Table 5. Requirements of the platform referring to a persona (*1 = not beneficial and 7 = very beneficial).**

	Persona 1 (*n* = 3)	Persona 2 (*n* = 4)	Persona 3 (*n* = 3)	Persona 4 (*n* = 3)	Persona 5 (*n* = 4)	Persona 6 (*n* = 3)	Persona 7 (*n* = 3)	Persona 8 (*n* = 4)
Domestic products	7.00	6.50	4.67	2.67	5.50	5.67	6.00	5.00
Health products	5.00	6.25	6.67	5.33	4.00	5.33	6.67	3.00
Wellbeing products	5.67	6.25	5.33	4.67	5.50	6.00	7.00	3.00
Domestic services	5.00	5.25	5.00	5.00	5.00	5.50	6.67	3.00
Wellbeing services	5.67	6.00	4.67	5.00	4.75	6.00	6.67	3.00
Health services	5.67	6.00	6.00	5.67	6.00	5.00	6.67	3.00
Contact with others	6.33	6.75	6.33	4.00	6.25	4.33	7.00	5.75
Marketplace	6.00	2.25	4.00	4.33	4.50	6.00	6.00	5.00
Information ageing in place	4.00	4.25	6.33	4.33	6.25	4.33	7.00	5.50
Information local activities	5.00	6.00	6.67	5.00	6.75	5.67	7.00	5.50
Integration local platforms	4.00	5.75	6.00	5.33	6.75	5.67	6.67	4.25
Integration national platforms	3.33	4.75	5.00	4.00	6.75	6.00	6.67	4.50
Contact with end user groups	6.33	6.50	6.00	4.67	4.50	5.67	7.00	2.25

According to the focus group participants (*n* = 27), the eight different personas can all benefit from a digital health and wellbeing platform. In their opinion **Contact with others** ($\bar{x}$ 6.07) is most beneficial and a **Marketplace** the least beneficial ($\bar{x}$ 4.48). For example persona 1, as a product provider, will be less interested in the **Integration of national platforms** ($\bar{x}$ 3.33), but likes to stay in contact with the end-user, preferable via **End-user groups** ($\bar{x}$ 6.33) and the **Marketplace** ($\bar{x}$ 6.00). Persona 2, who is single and isolated is more interested in **Contact with others** ($\bar{x}$ 6.75), and is probably not fond of the **Marketplace** ($\bar{x}$ 2.25) because she is not tech-savvy.

4. DISCUSSION

Not surprisingly we found that main purposes of a health and wellbeing platform may differ across countries. This implies that platform practices may not be easily translated from one country to another due to differing legislations, rules and guidelines. Nevertheless, the healthcare challenges for elderly people stay the same in most countries. The

importance of an intervention feature for the platform in the Netherlands implies that the government is becoming increasingly involved in providing healthcare services for ageing population. As a result, such a feature would help the government to stay in contact with citizens and become an intermediary between service providers and end-users. Nevertheless, not in every country the government is involved in healthcare in the same way. For example, in UK providing healthcare services are outsourced to third parties and the government is less involved (Wanless 2002). Increasing involvement of the government in healthcare arises several organizational questions such as if the government should be in the lead for development of such platforms and how that would influence participation of other parties. Different perspectives on platform functions from public and private stakeholders increases complexity in defining the range of services enabled by the platform and the related aspects of control. Another relevant question is that *who should be the platform leader (Gawer et al. 2008).* These questions show the relation between the main purpose of the platform (i.e., platform design) and organizational settings around the platform (i.e., ecosystem design). Although we found that the platform would be most beneficial for young elderly (age 55 - 75), elderly above 75 years old can still benefit from the platform as long as they have help from their relatives or other voluntary caretakers, district nurses or someone from the municipality. Therefore, we can speculate that the platform would be both a long- and a short-term solution for ageing challenges. The question of *who benefits from and who uses the platform* posed by one of the participants is enlightening. Distinguishing end-users from those who benefit from the platform is critical in the development process of the platform. This implies that instead of focusing on elderly over 75 years old, more attention should be paid to the requirements of supporters of those elderly. Only in that way, the platform can unburden family members in figuring out how to support their relatives in a sufficient way (Detering et al. 2010). Generally speaking, from the perspective of end-users, **contact with others**, and **gaining information about local activities** are the main requirements of a health and wellbeing platform. Clearly, these requirements can be related to the issue of loneliness and isolation of elderly people. This is in line with earlier studies, which highlight the issue of loneliness of elderly people (Hawkley et al. 2010). From the perspective of providers and municipalities, **offering Health and Wellbeing products and services** can be seen as the main function of the platform. Clearly, for providers, the platform should be an intermediary to facilitate interaction with end-users while reducing interaction costs. Nevertheless, depending on who is the main target group of the platform, requirements may adjust. This means that defining the main target group initially can facilitate decision making on what should be the features and functions for a platform. Moreover, knowing the target group can help to address the discussed issue of **awareness** and to reduce the **overall complexity** by first focusing on the main requirements. Note that functions can be extended later on in the process.

5. CONCLUSION

The objective of our research was to find out the main requirements of a health and wellbeing platform. The results of four focus group discussions show that a digital health and wellbeing platform can support people ageing in place. In addition, we found that the main requirements are related to **Contact with others, finding Smart Living products and services** and **information about Local activities.** The aim of the focus group sessions was to assess whether using personas as a user-centered design tool would lead to a better understanding of the end-user. Although, there is not that much research conducted to quantify the benefits of this technique (Long 2009) we can justifiably claim at the outset that there are positive benefits associated with using personas. Our goal was to provide the participants with a vivid description of a user, so that the participants can identify with the user throughout the design process. The personas made the needs of the end-user more explicit and thereby can direct decision-making for the platform developers towards those needs.

The existing literature on platform theory discusses the development and organizational arrangements around existing platforms (Evans et al. 2006; Meyer 1997). However, to the best of our knowledge the question how to design new digital platforms and what are the core functions of a platform are still unknown. This paper contributes to this gap by suggesting specific functions of a health and wellbeing platform. The practical implication is that personas can support the decision-making process during the design process of a platform.

We are aware of the reliability issue in focus group research. We strived to increase reliability in our study by using specific questions. Moreover, we aim to triangulate the results of this study with a survey study to further refine the requirements of the platform (Ward et al. 1991). The outcomes will serve as input for the development phase of the platform prototype. Next to that, we will improve the enrichment and evolution of the personas using storyboards, vision documents and task scenarios. In a way that the personas focus attention on a specific target audience to discover for whom the platform *is* and consequently *not is* being designed for.

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