

# Online community care platforms for older adults

*Do they support ageing-in-place?*

Sarah Willard



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Cover: Evelien Jagtman, Eva Willard

Layout: Tiny Wouters

Print: Ridderprint | [www.ridderprint.nl](http://www.ridderprint.nl)

ISBN: 978-94-6416-805-1

The research in this dissertation was conducted at: The Research Centre for Community Care (Academy of Nursing), Zuyd University of Applied Sciences and The School for Public Health and Primary Care (CAPHRI), Research Line Ageing and Long-Term Care, Maastricht University.

The research in this dissertation was funded by Zuyd University of Applied Sciences, The National Programme for Elderly Care (NPO), The Netherlands Organisation for Health Research and Development (ZonMw - 531001303) and the NutsOhra Fund (FNO - 102.515).

The printing of this dissertation was financially supported by Cubigo.



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## Do they support ageing-in-place?

### PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Universiteit Maastricht,  
op gezag van de Rector Magnificus, Prof. dr. Rianne M. Letschert,  
volgens het besluit van het College van Decanen,  
in het openbaar te verdedigen  
op donderdag 2 december 2021 om 12.00 uur

door

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## Table of contents

Chapter 1	General introduction	7
Chapter 2	Development and testing of an online community care platform for frail older adults in the Netherlands: a user-centred design	19
Chapter 3	A typology of online care platforms for community-dwelling older adults in the Netherlands: A scoping review	37
Chapter 4	Why do Dutch older adults use online community care platforms, or not? A qualitative study	71
Chapter 5	Perceived Impact of an Online Community Care Platform for Dutch Older Adults on Local Participation, Informal Caregiving, and Feelings of Connectedness: Pretest-Posttest Observational Study	97
Chapter 6	Online community care platforms for older adults: opportunities and barriers	117
Chapter 7	General discussion	129
Addendum	Summary	147
	Samenvatting	155
	Impact paragraaf	161
	Dankwoord	167
	About the author	173
	List of publications	175



# Chapter 1

General introduction



As a response to the growing population of older adults in Europe governments encourage and try to enable ageing-in-place<sup>1</sup>. Older adults are stimulated to live independently in their own homes for as long as possible and are increasingly expected to take care of themselves instead of relying on health care<sup>2</sup>. These developments have led to a search for other means to support older adults. Current technologies provide opportunities to make ageing-in-place more achievable, as it is anticipated that these can support older adults to access resources that their community has to offer<sup>3</sup>. Technology for ageing-in-place includes a variety of technologies. In this dissertation a specific ageing-in-place technology is pivotal: online community care platforms. These platforms aim to support civic participation on a community level, and are often introduced to benefit the ageing population of a community. In particular in the Netherlands, numerous online community care platforms have been deployed and implemented. Fairly popular examples are 'Nextdoor'<sup>4</sup>, 'MijnBuurtje'<sup>5</sup> and 'Wijkconnect'<sup>6</sup>. Although they are expected to contribute to the support of community-dwelling older adults, there is still a lot of uncertainty and debate about their added value. Additionally, there are merely small and rather fragmented initiatives as of yet; large-scale implementation or use barely occurs despite considerable efforts to implement these platforms. Furthermore, barely any studies report on understanding what drives (dis)continued use of these platforms once they have been implemented. Do older adults want to use these platforms? Do they help them to participate locally and to arrange their own care and support needs? This dissertation focuses on the perspectives of older adults regarding the use, experiences and perceived impact of online community care platforms.

## Ageing-in-place

In Europe the number of people aged 65 and over will increase in the upcoming 30 years, from 91 million in 2020 to 130 million in 2050; approximately 30% of the EU-27 population will be 65 years or older in 2050<sup>7</sup>. Furthermore, the older population itself ages progressively; the very old group (people aged 85 years or older) is growing at a faster pace than any other age group. Between 2020 and 2050, the number of very old people in the EU is projected to more than double; from 12.5 million to 26.8 million<sup>7</sup>. The ageing of the EU population as such can be seen as a success since older adults are now living longer, healthier and under better living conditions than ever before. At the same time there is a paradoxical development: due to the ageing of the population and better treatment methods, more older adults are now struggling with one or several



chronic diseases and disabilities. Further downsides of the ageing population are negative effects on economic growth as well as an increasing pressure on the labour market and health care budgets. These developments are closely linked to the 'old-age dependency ratio': too few people will be available on the labour market to care for the large older population. In Europe, this already has led to an increased burden on government finances, changes to the statutory retirement age and lower levels of pension provision<sup>8</sup>. Consequently, doing more of the same is not enough and systematic change is needed<sup>9</sup>.

Ageing-in-place is defined as "the ability of older people to live in their own home and community safely, independently, and comfortably, regardless of age, income or level of intrinsic capacity"<sup>2 p36</sup>. Older people themselves prefer to live in their own home and community for as long as possible<sup>2</sup>. Furthermore, it is expected that ageing-in-place will have positive financial consequences for the care system<sup>10</sup>. Ageing-in-place is one of the Dutch strategies aimed at creating a more participatory society based on individual responsibility<sup>1-2</sup>. As the Dutch government decentralised welfare and care support from national to local governments, the latter are now responsible for supporting older people with regard to ageing-in-place. Although local governments actively support citizens, they also make a greater claim to their responsibility: they emphasize personal responsibility for one's own self, for the care of others and for the wellbeing of the community<sup>11-13</sup>.

## Civic participation

Conforming to the concept of ageing-in-place, community care and support are reinforced. It is expected that older adults should and can carry more responsibility for their own and each other's welfare and for the well-being of the community<sup>12</sup>. This expectation implies that older adults participate locally and address informal care, and other resources from their immediate vicinity if needed. A prerequisite to meet these expectations is a certain degree of social cohesion and social capital which "represent resources that individuals can access via membership in a group or community (...) such as norms of reciprocity, civic participation, trust in others, and the benefits of membership"<sup>14 p143</sup>. Cramm et al.<sup>14</sup> demonstrate that community social capital (obtaining support through indirect ties such as from neighbours) and community social cohesion (interdependencies among neighbours) positively affect the wellbeing of community-dwelling older adults and enables them to self-manage their own care process.

Civic participation, or similar terms such as “civic engagement,” “social participation,” “social engagement,” and “pro-social behavior”, embodies a large range of activities. Cnaan and Park<sup>15</sup> performed an exhaustive review of this concept and distinguish six forms of civic participation:

1. *Association participation*; e.g. membership in voluntary associations or active participation in these associations.
2. *Giving*; e.g. the giving of donations to charities and giving household items to neighbours.
3. *Volunteering*; e.g. formal, informal, episodic, virtual and workplace volunteering.
4. *Environment-friendly behaviours*; e.g. actively participating in environmental campaigns and joining environmental organizations.
5. *Political and social behaviour*; e.g. such as signing petitions and voting.
6. *Supporting-helping individuals*; e.g. random acts of charity, lending an item or commodity to others and befriending lonely people.

In this dissertation mainly the forms ‘giving’, ‘volunteering’ and ‘supporting-helping individuals’ are addressed. Especially (mutual) informal volunteering and informal caregiving are key concepts to our studies. Informal volunteering is defined as “activities that individuals do on their own and often to assist neighbours, colleagues, friends, or the community”<sup>15 p26</sup>. Informal care is generally defined as the unpaid care provided to older and dependent persons by a person with whom they have a social relationship, such as a spouse, parent, child, other relative, neighbour or friend<sup>16-17</sup>. There is an increasing emphasis on this informal form of care and volunteering; these are community resources for older adults to successfully age-in-place.

## Technology for ageing-in-place

Current technologies provide opportunities to make ageing-in-place and civic participation more achievable, as they can support older adults to access resources that their community has to offer. In other words, technology has the potential to help older adults to age-in-place<sup>3,18-25</sup>. Commonly used major terms to define technologies for ageing-in-place are eHealth, gerontechnology or digital technologies for ageing-in-place (DTAP). These terms are used interchangeably in the literature and encompass a broad range of technologies and services such as telemedicine, telecare, mHealth, ambient assisted living (AAL), smart home technology (e.g. emergency help systems, vital signs monitoring, fall detection systems) and healthcare robots (e.g. home service robots and socially assistive robots)<sup>25-27</sup>.

Queirós<sup>25</sup> illustrates that eHealth mostly focusses on applications to support home monitoring, as well as to promote the empowerment of older adults and their informal caregivers, targeting a wide range of chronic conditions (e.g. diabetes, heart failure) and that there is a lack of systematized evidence of the state of the art research when looking for community-dwelling older adults *without specific chronic conditions*. The promotion of health lifestyles (e. g. physical activity, nutrition and weight management or health education) has received considerably more attention than the technologies for ageing-in-place designed to support other aspects of the daily living of community-dwelling older adults (e.g. loneliness and social isolation or civic participation)<sup>25</sup>.

## Online community care platforms

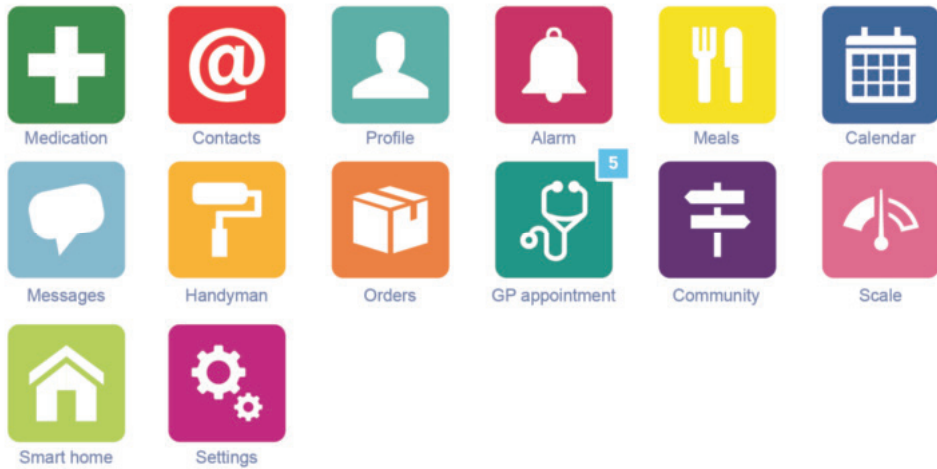
This dissertation focuses on a specific ageing-in-place technology: online community care platforms. As Adbelrjala, Ismailb and Othmanc<sup>18</sup> describe, the term online platform has many contrasting definitions and over-lapping views: “in general, a platform is a group of technologies that are used as a base upon which other applications, processes or technologies are developed”<sup>p889</sup>. In this dissertation we define a platform as *a coherent combination of hardware and software components that are able to provide a base upon which software applications can operate*. These platforms look very much like and operate similar to the well-known ‘smartphone’.

An online community care platform is a platform type aimed at supporting civic participation on a community level, and is often introduced in particular (however not solely) to benefit the ageing population of a community. The online platform that was at the heart of the current dissertation used the software infrastructure Cubigo<sup>28</sup>, see Figure 1.1. A few examples of its applications are:

- a) a matching tool for informal care in which older adults can ask for, provide or be offered help,
- b) a calendar, in which older adults can access information on various local leisure time activities and, messages, by which older adults can communicate with each other by email.

Although not many studies have addressed these specific platforms, a lot is known regarding the impact of more common online communities for older adults, which are known under different names such as ‘social networking sites’ (such as Facebook, Twitter, LinkedIn) ‘online social networks’ or ‘online social communities’. Prior research shows that the aforementioned have a positive impact for older adults on civic

participation and that they can help to develop and maintain social relationships and to exchange various forms of informal care and volunteering<sup>20-24</sup>.



**Figure 1.1** Screenshot of the Cubigo platform.

The Cubigo-platform complies with important user(-interface) requirements determined by previous research on online communities for older adults: a) simple and minimalistic interface, b) large-visual elements, e.g. icons and buttons, c) important information is placed in the centre, d) strong contrast between fore- and background, e) user-based, f) interactive and entertaining (e.g. games), and g) community-driven<sup>24,29-30</sup>. The Cubigo platform also meets the requirements as defined by Boll and Brune<sup>31</sup> who argue that an online social network for older adults should combine elements of service-platforms and social networks. Online social networks should at least have applications regarding: a) contacts, b) user-profile, c) (local) services and d) communication.

## Objectives

The main objective of this dissertation is to evaluate user-centred developed online platforms that can be used by community-dwelling older adults to participate in their community and to arrange mutual informal care and volunteering. The underlying aims are as follows:

1. To investigate the needs and requirements of older adults with regard to an online community care platform.
2. To explore which online (health)care platforms for older adults are available and to provide a typology of these platforms.
3. To examine the experiences and perceived impact of older adults regarding an online community care platform.
4. To investigate the experiences and lessons learned from other initiatives that implemented online community care platforms.

As previously described, platforms using the Cubigo software infrastructure were central to this dissertation. Both the first and third objective were achieved by evaluating online community care platforms which used the Cubigo software.

## Action research approach

A deliberated choice was made for an action research approach. In this dissertation action research is not so much defined as a methodology, but “... *as an orientation to inquiry that seeks to create participative communities of inquiry in which qualities of engagement, curiosity and question posing are brought to bear on significant practical issues*”<sup>32 p1</sup>. This approach seeks to simultaneously achieve a process of change, learning and knowledge development. In this regard striving for change can mean that, for example, a new intervention, digital tool, or method is developed or that solutions are being sought for problems originating from real-life settings<sup>33</sup>. Research is thus seen as an instrument via which learning and change can be achieved. In this perspective reality is approached from a social and relational constructivist paradigm which assumes that the world cannot be known as it is. Action researchers assume that meanings are developed together with others rather than as separate individuals<sup>32</sup>.

The action research approach offers a new angle on the practical relevance of research by contributing to the context that it studies *during* research. Subsequently, it was of importance to approach the studies that focused on evaluating the process from an open and inductive research perspective. Because action research is participatory in nature, it corresponds with the notion that it is important to involve end-users in research<sup>33</sup>. This research approach was chosen as it fits seamlessly with the theoretical theme which underlies this dissertation: civic participation. Consequently, in this dissertation the development of an online community care platform, together with its end-users, was central and researchers had frequent interactions with all involved.

## Outline of this dissertation

**Chapter 2** provides information regarding the user-centred design (UCD) of the online (Cubigo) platform for frail older adults. Furthermore, this chapter provides insight into the needs and requirements of older adults and reports on a 6 month test-study in which the usability and user experiences of frail older adults aged 65 years or older were explored. **Chapter 3** describes the results of a scoping review regarding available online care platforms for Dutch older adults, providing an overview and a typology. The details regarding the platforms' goals, applications, target group, implementation phase, costs and effects are described in this chapter. **Chapter 4** presents the findings of a qualitative study that explores the implementation of a (Cubigo) platform in Heerlen through an intensive user-centred process that took over a year. The experiences of users and non-users (n=17) and their motives to adopt or reject the platform were investigated. **Chapter 5** describes a pretest-posttest observational study that was conducted to investigate the self-reported use, expectations and perceived impact among older users (n=47) of a Cubigo platform called Grubbenvorst-Online (GO). Data regarding the expectations and the perceived impact of GO was compared and tested. **Chapter 6** reports the main lessons learned from a conference (n=20) where municipalities, care and welfare professionals, entrepreneurs, and local residents came together in order to jointly identify the opportunities and barriers in the implementation of online community care platforms and to arrive at recommendations for successful implementation. Finally, **chapter 7** discusses the main findings and reports on implications for research, practice and policy.

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# Chapter 2

Development and testing of an online community care  
platform for frail older adults in the Netherlands:  
a user-centred design

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*BMC geriatrics* 2018;18(1):1-9

## Abstract

### Background

Recent transitions in long-term care in the Netherlands have major consequences for community dwelling older adults. A new paradigm expects them to manage and arrange their own care and support as much as possible. Technology can support this shift. A study has been conducted to explore the needs of community dwelling frail older adults with regard to an online platform. An existing platform was subsequently modified, based upon these needs, resulting in an online community care platform (OCC-platform) comprising of care, health, and communication functions. The purpose of this platform was to support frail older adults in their independence and functioning, by stimulating self-care and providing reliable information, products and services.

### Methods

The study used a User-Centred Design. The development processes involved the following steps: Step 1) Identification of the User Requirements. To assess the user requirements, direct observations (N=3) and interviews (N=14) were performed. Step 2) Modification of an Existing Online Platform. Based upon Step 1, available online platforms were explored to determine whether an existing useful product was available. Two companies collaborated in modifying such a platform; Step 3) Testing the Modified Platform. A total of 73 older adults were invited to test a prototype of the OCC-platform during 6 months, which comprised of two phases: (1) a training phase; and (2) a testing phase.

### Results

An iterative process of modifications resulted in an interactive software concept on a Standard PC, containing 11 Functions. The Functions of 'contacts', 'services' and 'messaging', were by far, the most frequently used. The use was at its highest during the first 2 weeks of the testing and then its use steadily declined. The vast majority of the subjects (94%) were positive about the usability of the platform. Only a minority of the subjects (27%) indicated that the platform had added value for them.

### Conclusion

The overall prospect was that an OCC-platform can contribute to the social participation and the self-management competencies of frail older adults, together with their social cohesion in the community. In order to validate these prospects, further research is needed on the characteristics and the impact of online platforms.

## Background

Recent transitions in long-term care in the Netherlands have major consequences for community-dwelling older adults. They are now encouraged to stay at home for as long as possible. The responsibilities for care are now shifting from the health care system to older adults themselves, together with their social network. This shifting creates a new paradigm in which self-management competencies are highly valued. This new paradigm expects older adults to manage and arrange their own care and support, and if needed, to be supported by their social network (i.e. neighbours, family, friends)<sup>1</sup>.

Most older people are relatively healthy, living independently in their own homes, and participating in their own community. Older adults who are vital and active will probably not experience many difficulties when selfmanaging their own care. Nevertheless, up to 38.5% of older adults are considered to be frail, with an increased risk for (further) functional decline and institutionalisation<sup>2</sup>. Frailty is defined as “a dynamic state which influences a person that experiences a loss in one or more domains of human functioning (physical, psychological, social)”<sup>2</sup>. This frailty can transpire due to a range of diseases and medical conditions<sup>3</sup>. The rapid increase of frail older adults with chronic diseases, multimorbidity, as well as complex health problems, affects the demand for health care services, while at the same time, financial resources and manpower are both shrinking<sup>4,5</sup>.

We will only succeed in this evolving transition when we search for comprehensive new and smart strategies, in a close collaboration between all of the stakeholders involved. Technology can support these strategies. An example is an online platform offering an infrastructure, in order to interlink people, provide access to professional services, as well as to promote (‘real life’) encounters and mutual activities<sup>6-8</sup>. An online platform is a coherent combination of hardware and software components that are able to provide a base upon which software applications can operate.

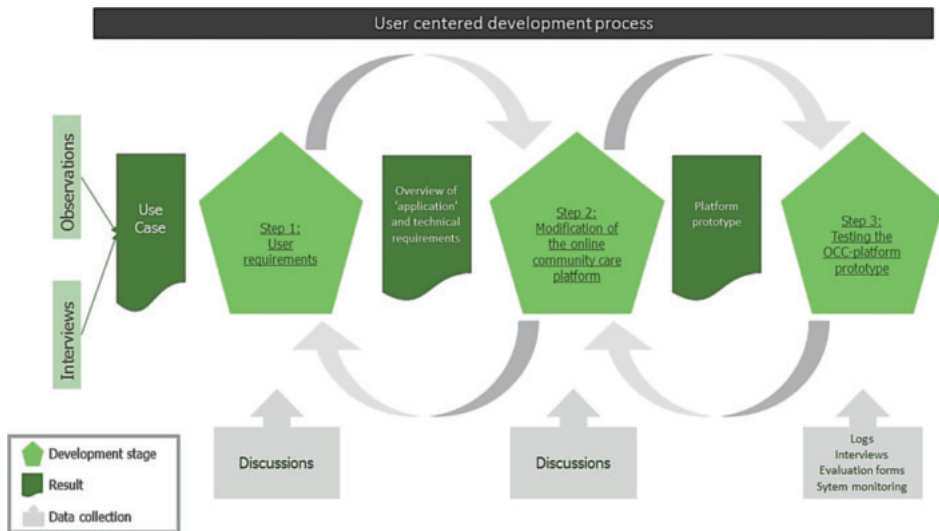
There are dozens of online health and welfare platforms. These mainly focus on delivering health care services and they are primarily developed from the perspective of health care professionals<sup>9,10</sup>. Frail community-dwelling older adults especially need support in other domains, such as access to information, services, and communication<sup>11</sup>.

We have conducted a study to explore the needs of community-dwelling frail older adults, with regard to an online platform. An existing platform was then modified, based upon these needs. This resulted in an online community care platform (OCC-platform) that comprised of health, well-being, and communication functions. The purpose of this platform was to support frail older adults in their independence and

functioning, by stimulating selfcare and providing reliable information, products and services. The main aims of the study were: 1) to modify an existing online platform, based upon the needs of frail older adults, and 2) to test this modified prototype platform on the usability and the feasibility of frail older adults.

## Methods

We used a User Centred Design (UCD) [12]. A UCD is a framework in which the needs of the end users are given extensive consideration at each stage of the product's design. The iterative nature of a UCD and the inclusion of various feedback loops are essential in adapting the technology to end user needs<sup>11</sup>. The user-centred development processes regarding the OCC-platform involved the following steps: 1) Identification of the User Requirements; 2) Modification of an Existing Online Platform; 3) Testing the Modified Platform. The study was carried out in Limburg, the most southerly province in the Netherlands. Figure 2.1 provides an overview of the steps in this study.



**Figure 2.1** Overview of the steps in this study.

## Step 1: User requirements

In order to assess the personal needs and the requirements of frail older adults, direct observations and interviews were performed. Various organisations (e.g. a client-interest group, a hospital, and a local municipality) were asked to select suitable candidates (i.e. people who were living at home, and over 65, N=17) to be included in this part of the study. This resulted in 17 frail older adults who participated in either the direct observations (N=3), or the interviews (N=14).

First, the direct observations were held during half a day and they were conducted at the homes of 3 older adults. The goal of the direct observations was to gain an insight into 'an average day' of older adults. The direct observations were non-invasive, i.e. aiming to minimally disturb their normal routines and behaviour due to the presence of the researchers. Afterwards, each participant was interviewed, in order to confirm the direct observations, by asking questions, such as: "What problems do you encounter in daily life?"; "What problems do you encounter with respect to social contact?"; "How do you deal with these problems?" The results from the direct observations were then analysed. From these analyses, corresponding topics were selected and they were then converted into the interview questions. The subsequent 14 interviews contained items such as social participation and communication. The interviews were carried out, in order to confirm the accuracy and the completeness of the results, arising from the direct observations. Examples of the topics and the interview questions are listed in Table 2.1.

The results from the observations and the interviews were used to draft 'use cases', as well as narratives about the 'modus operandi' of the OCC-platform. This was all from the perspective of the proposed users<sup>13</sup>. These use cases were discussed and they were optimised by a geriatrician, a practitioner nurse, as well as the representatives of the frail older adults, together with four of the researchers. The final use cases were converted into user requirements, and then subsequently, they were divided into functional and technical requirements.

## Step 2: Development of the prototype platform

Based upon Step 1, the field of online platforms was explored, in order to determine whether an existing product was befittingly available. We sought for an existing useful online platform that was suitable for older adults, with a low cost, and available in the Dutch language. Furthermore, the owner of the platform had to be willing to modify it, based upon the user requirements. Consequently, several ICT companies were approached and consulted.



**Table 2.1** Interview topics and questions.

Topics	Item	Examples of the Interview Questions
Social Participation	Social Contacts	With whom are you currently in touch with the most?
	Social Activities	In which (community) activities do you participate? What welfare services do you use?
	Care Contacts	With which health care professionals do you have contact?
Communication Needs	Remote Communication	What techniques would you like to use, in order to communicate with professionals or other people?
Technology Needs	Technology Features	If a device were to be developed, in order to enable remote communication, what requirements should it meet?
	Expectations Regarding Technology	How do you feel about remote communication?
	Affinity With Technology	Are you experienced when working with computers? For what purposes do you use a computer?

Finally two companies were selected to work together and to develop a prototype platform. The company that was first selected presented the most promising online platform, as their software was of an ‘open source’, and thus, it was suitable for modification. Moreover, their platform, entitled “Cubigo”, contained certain features which had been labelled as being significant in the user requirements (i.e. communication and information on local services, events and activities). The choice was, therefore, to select their platform. Another company was selected to supply the ‘video call service’, since the platform of the ‘first’ company did not contain such a function.

The two companies modified the platform, based upon the user requirements that resulted from Step 1. Further optimisations were administered following discussions with the researchers and the representatives of the older adults. The proceedings were accomplished by arranging the following feedback-moments: Feedback-sessions regarding the layout: the researchers and the representatives of the frail older adults were asked to give their feedback on the layout of the platform (e.g. menu structure, visibility). The results were used to improve the platform’s layout.

- Tests by the researchers: the researchers were asked to test the prototype platform and to pay special attention to the usability of the platform and to any occurring inaccuracies. The results from these tests were used to improve and to optimise the usability of the platform. These processes were repeated several times.
- Tests by the representatives of the frail older adults: the prototype platform was tested in the home-environment of the representatives. The goal of these tests

was to try-out several functions of the prototype platform (e.g. the video call services, text messages, and so on.). The representatives were also asked to pay special attention to the usability, the visibility, and the interactions. The results of these tests were used to improve and to optimise the online prototype platform.

After the abovementioned tests, the researchers, the local municipalities, and the care and welfare organisations, all provided content (i.e. information) for the platform. This resulted in a prototype platform that was ready for final testing.

### **Step 3: Testing the OCC-prototype-platform**

In order to test the prototype platform, a panel of participants was monitored for 6 months. Frail older adults were invited to participate via an information letter that was distributed by senior council workers, a hospital, care organisations, welfare organisations, in addition to general practitioners. Suitable participants (i.e. people who met any of the following criteria: aged 65 and older; at a risk of decline in physical, psychological, or social functioning; suffering from a geriatric syndrome; suffering from a specific somatic condition; living independently at home without a partner) were subsequently approached by the project members. The participants were introduced to the OCCplatform by way of a personal instruction and a demonstration. When the participants did not have access to a computer, or the Internet, these were made available to them free of charge. A total of 73 older adults were invited to participate in order to test the OCC-prototype-platform.

The testing comprised of two phases: (1) a training phase; and (2) a testing phase. Both of these phases consisted of tasks that had to be carried out by the participants individually, in their own home, and on their personal computer. The training phase, in order to become familiar with the platform, included various exercises in which the participants were asked to concentrate on specific functions. In the first week, the participants were asked to use the first three functions of the platform and to record their findings in a log. The participants were then contacted by telephone to discuss their findings and to receive a new assignment (i.e. to use the next three functions for a week and to record their findings). These procedures were repeated until the entire platform had been appraised. After these training exercises, the testing phase commenced. The participants were asked to continue using the platform freely and to log their experiences.

More participants were gradually included. The quantitative data of the user frequencies was automatically documented by the platform's system, in log files, during the entire testing phase. Finally, all of the participants were interviewed in their

own homes at the end of the testing phase. This interview consisted of 34 questions of which 23 addressed the usability of the OCC-platform (e.g. logging in to the platform, the menu's structure and usability of the platform's functions). The remaining 11 questions were dedicated to user experiences (e.g. did the OCC-platform contribute to feelings of safety and did older adults perceive the platform as having added value). The data were analysed by means of conventional content analyses<sup>14</sup>.

## Data analyses

The interviews (Step 1 and Step 3) were transcribed and then they were qualitatively analysed. The data from the user's log files was imported into SPSS and this was descriptively analysed (an overview of the frequency in which the tools were used and the trends of their use over time). Participants were gradually included into the testing phase (Step 3). As a result, the duration of participation varies from 15 to 30 weeks. To standardize the follow up period we restricted this to 15 weeks for every participant. We excluded the first three and last two weeks of data to avoid learning effects (i.e. we gave users the possibility to get accustomed to the platform) and fade-out effects. Therefore, we analysed the log files on the user frequencies restricted to 10 weeks for every participant.

## Results

### Wishes and needs regarding daily life, communication and technology

The goal of the direct observations was to gain an insight into the wishes and the needs of the frail older adults regarding their daily life and their communication. The direct observations were conducted at the homes of 3 frail older adults (2 females of 75 and 72 years and a male of 71 years) , who all lived independently in their own home and were married. It turned out that they: (1) often stayed at home because it was perceived as being safer; (2) often received health care provided by informal and/or formal caregivers; (3) experienced limitations in their social contacts and they wished to have more face-to-face contact with their family and friends, or to be more involved in the community; (4) were dependent on transportation that was offered by their children or friends. Moreover, the 3 observed older adults felt that telecommunication technologies could improve their well-being and their feelings of safety. An important requirement, however, was that potential interventions should be user-friendly. For instance, the platform should have clear buttons or icons; there should be an easy

menu structure; the platform should feature a short and understandable user manual; and it should be suitable for transport. The interviews were conducted at the homes of 14 older adults and they were focused on their wishes and their needs regarding social participation, communication and technology. The participants (N=14) had a mean age of 79 (SD=6) and 9 of them were female. All participants lived independently in their own home and 12 of them were widowed. The results demonstrated that their social network consisted of children, siblings, neighbours and friends. Overall, the interviewees were unsatisfied with the degree of contact that they had with their children and siblings. Depending upon their health, they were involved in all kinds of activities (e.g. viewing sport, church attendance, and so forth.). The interviewees had contact with various health care professionals, such as visiting nurses, general practitioners, nurse practitioners, and physiotherapists. According to the interviewees, an OCC-platform should include the following functions: telephoning (including a video call service), text messaging, distress calls, and a calendar. Although 12 older adults were positive about the concept of an OCC-platform, the majority were not interested in screen-to-screen contact with health care professionals. Approximately 50% of the participants had a basic knowledge of computers and a little fewer than 50% owned a personal computer (PC). The PC owners generally used them for playing games, e-mailing, browsing online, administrative work, internet banking, and social media

## Use cases

The results from the direct observations and the interviews were used to draft 'use-cases'. Their structure was as follows: (1) case (e.g. general information, health problems, social problems, hospitalisation, and frailty); (2) intervention (e.g. family, an online platform offered them a support system); (3) ideal situation (e.g. frail people used the OCC-platform and they were satisfied with the functions/features and the usability).

## User requirements

Based upon the use cases, two lists of requirements were drafted by the researchers, namely (1) 'Function Requirements', and (2) 'Technical Requirements'. Table 2.2 lists the required functions that are distributed over three topics: (1) General; (2) Community; and (3) Health.

The OCC-platform also had to meet several technical requirements: usability (the usage and the operation should be easy and intuitive, little to no affinity with computers needed); visibility (big screen for better visibility, use of icons, pictures, photos); flexible

interaction (touch screen capability); accurate operation (robust operation, no technical failures during operation); convenience regarding transport (device should be portable, small, light, robust and wearable); it should be possible to add supplementary functions.

**Table 2.2** User requirements: functions.

General	Community	Health
<i>Safety &amp; Comfort</i> Personal Alarm; Smoke, Gas and Burglar Alarm; Intercom; Home Automation.	<i>Social Safety</i> Distress Call; Good Morning Service provided by a Welfare Organisation.	<i>Health Consultation</i> Primary Care Consultation (e.g. the practitioner nurse); Clinical Care Consultation (e.g. the clinical geriatrician).
<i>Services</i> Meals Delivery Service; Grocery Service; Banking Service; Job Services; Information Provided by Local Municipalities.	<i>Community</i> Service to arrange Transport; Information about Local Events and Activities; Interactive Games; Community Resources listed on an Interactive Map.	<i>Health Calendar</i> Medication Reminder; Appointment Reminder; Possibility to ask Questions Online for a Consultation; Results of the Consultation.
<i>Communication</i> Video Calling Services; Chat Room; SMS.		<i>Health Advice</i> Lifestyle Advice/Counselling; Online Contact with Paramedics; Medication Counselling Online; Telemedicine (e.g. remote monitoring of psychical parameters).
<i>News &amp; Entertainment</i> Newspaper/Book (Read Aloud); Calendar with Audio and Reminders; Games to Play Individually.		

## The OCC-prototype-platform

An iterative process of modifications and optimisation resulted in an interactive software concept installed on a Standard PC, containing 11 Functions (cubes) in the Main Menu (Figure 2.2): Emergency Call, Services, (Video) Contacts, Clock, Calendar, Medication Reminder, News, Sending and Receiving Messages, Information about the Community, Information from Municipalities, and Games.

Every function was comprised of submenus. The main menu also contained an extra function of “add cubes”, which gave the users the possibility of tailoring the basic screen according to their wishes, by adding, deleting and/ or reordering functions (cubes). The development of the previously described OCC-prototype-platform resulted in considerably more time and energy than expected. In order to ensure a tangible involvement of health care providers, (i.e. health care providers who actually provided content for the OCC-platform), several visits and a lot of persuading was

necessary. In the end, it took us half a year to persuade the health care providers to provide information content for the OCC-platform.



**Figure 2.2** Screenshot of the OCC-platform.

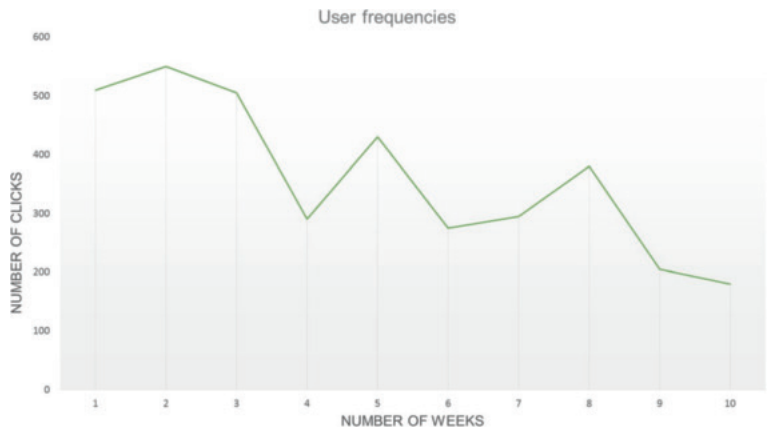
## Testing the OCC-prototype-platform

Of the 73 approached candidates, 55 older adults were included in the testing study. Eventually, 33 of them finished the entire monitoring period of 6 months. Eventually 22 participants withdrew from the study due to hospitalisation, or because they found participation in the study too time consuming. Of the 33 participants that completed the study, 20% were younger than 70 (the youngest was 65) and 60% were 70–80 years old. Eight participants did not have a computer or an Internet connection. These were made available to them, free of charge.

## User frequencies

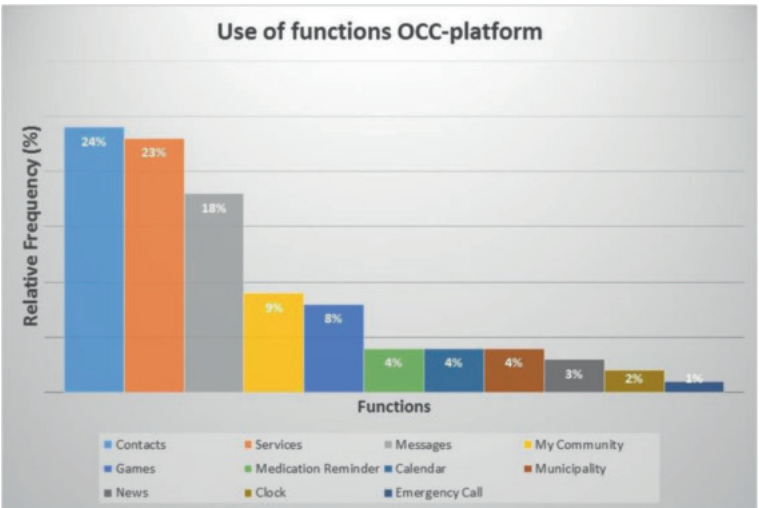
As portrayed in Figure 2.3, the frequency of use of the OCCplatform generally decreased over time, with a few peaks between weeks 4 and 5 and weeks 7 and 8. In the first 2 weeks of the study, the participants clicked 500–550 times (all of the

functions included). This frequency decreased to approximately 170–205 clicks per week over the last 2 weeks. These data relate to 33 participants with complete data over the 10 week period.



**Figure 2.3** Frequency of use of the OCC-platform distributed over 10 Weeks.

Figure 2.4 further visualises the frequency of use per function. It shows that the functions of ‘contacts’, ‘services’, ‘messages’ and ‘my community’ were the most frequently used (74% of total usage). Conversely, the functions of ‘news’, ‘clock’ and ‘emergency call’ were rarely accessed (6% of total usage).



**Figure 2.4** User frequencies per platform function.



## Usability

The main topics regarding the usability of the platform were: logging into the platform, the design of the main menu and submenus, the format and structure of the main menu and sub menus, the visibility and recognisability of the buttons, the readability of the text, the brightness of the colours, as well as the clarity and the audibility of the sounds. In general, 33 participants gave a positive score for the usability of the OCC-platform (94% stated that they found the platform easy to use). Nevertheless, several recommendations were made. The most important of these was that the OCC-platform login should be made easier (username and password were often forgotten) and that the number of functions and the arrangement of the functions in the main menu should be individually adaptable. Additionally, the functions and the sub functions gave too much information (too many choices for the selections, too many actions required).

## User experiences

The comments of the participants with respect to their experiences with the platform vastly diverged. The majority of the participants (73%) disagreed with the proposition: "the platform adds value to my daily life". Possibly they perceived themselves as being vital and active and not (yet) in need of support by the OCC-platform. Only 9 of the 33 subjects (27%) indicated that "the platform provided feelings of safety". Two thirds (67%) of the older adults preferred communicating via video, over communication by telephone. Furthermore, 18 of the 33 (55%) had the intention of using the platform actively after the testing period and 27 of the 33 (82%) reported that they would recommend the platform to others. A few of the participants advised the researchers to include some additional functions, such as: home automation (opening and closing the curtains and doors, controlling the heating); monitoring bodily functions (heart rate, blood pressure); a tool for matching care demanders and volunteers; hobbies; public transportation; taxi transportation; and games.

## Discussion

Based upon the user requirements of the frail older adults, an online community care platform was developed and tested on its usability and its feasibility over a six months period. The main aims of the study were: 1) to modify an existing online platform based

upon the needs of the frail older adults, and 2) to test this modified prototype platform on its usability and its feasibility among frail older adults.

The most pertinent needs of the participating frail older adults were that they experienced limitations in their social contacts and they wished to have more face-to-face contact with their family and friends, or to be more involved in the community. Overall, the participants felt that telecommunication technologies could improve their well-being and their feelings of safety (i.e. the frail older adults seemed to be receptive to the idea of an OCC-platform). The OCCplatform was modified and optimised by two companies based upon the user requirements. This process resulted in an accessible interactive software concept on a Standard PC, containing 11 Functions (cubes) in the Main Menu. The OCC-platform functions of 'contacts,' 'services' and 'messaging' were by far, the most frequently used. The usage of the platform was at its highest during the first 2 weeks of the testing study and then it steadily declined. Although the vast majority of the subjects were positive about the usability of the platform, only a minority (27%) indicated that the platform had added value.

An explanation for the decline in user frequencies was that the first part of the testing study, the training phase, was guided intensively by the researchers. In the second part, the platform was used 'freely' without external incentives to do so. The temporary increase of activity in week 7–8 was probably caused by an announcement that in those weeks, there would be an evaluation of activities by the researchers. These results have indicated that the OCCplatform did not produce sufficient incentives to keep the users active. In previous research, a similar low usage of online, or eHealth interventions, has been reported<sup>15-18</sup>. For example, the Dutch eHealth Monitor 2016 demonstrated that despite the availability of many eHealth tools, the end users hardly adopted them. Krijgsman et al. explained that the scarce adaptation of eHealth resulted from a 'lack of awareness' (i.e. the end users were unaware of the potential, the possibilities, or even the existence of eHealth). Furthermore, the end users would often rather stick to old habits, than adopt themselves to new ways and means (e.g. using the telephone to make appointments, instead of an online tool, filling out forms on paper, instead of online, and so forth). In order to encourage the adaptation of eHealth, it would be important to actively stimulate the usage and to promote eHealth<sup>18</sup>. Additionally, it would be vital that an eHealth OCC-platform contained content and functions that were of a value for its users.

Furthermore, as explained regarding the OCC-platform prototype, it took us half a year to persuade the health care providers to provide information for the OCC-platform. It seemed that they partly did not have a clear idea yet of their role or the platform's added value. Also, it is conceivable that some of them dreaded a possible increase in

workload (e.g. using e-consults or video-calling tools, to register and share information via a platform etc.).

As the results have shown, the functions of communication (e.g. messaging) and participation (e.g. my community) were often used. Moreover, the participants seemed to have a preference for communicating via video call services, instead of communicating by telephone. Makai and colleagues<sup>15</sup> also reported that communication functions (e.g. messaging) were the preferred functions by older users. These results have indicated that an OCC-platform would have the potential to support community-dwelling frail older adults, especially in communication. However, this would only be true for communication between the end users and their family or friends. This would not apply to communication with the health care providers.

Only a quarter of the subjects indicated that the platform had added value. A possible explanation for this might be that OCC-platform technology still needs to be improved (e.g. an easier login), that it lacks specific relevant functions (e.g. transport or home automation), or that the information content was not up to date.

## Practical recommendations

The results have suggested that an OCC-platform has the potential to support community-dwelling older adults, provided that the platform contains content and functions that are of value for its users, in addition to the fact that end users are informed about the platform. In order to accomplish this, the study has several practical recommendations. Firstly, give the end users more control and ownership of the platform. For instance, when the platform is implemented on a community level (e.g. a neighbourhood), it is recommended that local residents are involved, when the customisation of the OCC-platform takes place. Secondly, the membership of the local health care providers and the local (elderly) associations should be involved, in order to make arrangements about their role in providing information content. Thirdly, there is a need to actively stimulate the usage and to promote the OCC-platform via the aforementioned parties. Thus, by intensifying the involvement of the end users, the health care providers, together with the local associations, we can safely assume that the OCC-platform will be promoted. It would then have more added value, as well as containing appealing and up to date content.

The fourth recommendation concerns the manner in which the OCC-platform is to be financed. At present, most of the funding is collected from local entrepreneurs (e.g. bakery, barber shop) who display and advertise their services on the OCC-platform. Due to these business cases, the continuity of the platform would entirely be dependent upon whether entrepreneurs want to use this platform as a promotional

medium. Entrepreneurs, however, are not inclined to pay licence fees, in order to advertise on a promotional medium, from which they will only find a few customers. Conversely, the few customers (users) who actually use the OCC-platform can possibly be explained by a lack of the entrepreneurs to display their services. The business case of an OCC-platform will only work if all parties become involved (e.g. health care providers) and are willing to invest financially in an OCC-platform.

### **Limitations and strengths of the study**

This study has some limitations. In view of the modest sample size (especially in the direct observation and the needs part), the results should be interpreted with some caution. For instance, the results regarding the user requirements may not necessarily be applicable to all or other groups of older adults. The strength of this study was that the needs of the target group for this innovation (i.e. the frail older adults) were given extensive consideration at the selection, modification, and the testing of the OCC-platform. Another advantage was that the OCC-platform was tested in the home environments of the frail older adults.

### **Conclusions**

The overall prospect is that an OCC-platform can contribute to the social participation and the self-management competencies of frail older adults, as well as with their social cohesion in the community. In order to validate these prospects, further research is needed on the characteristics and the impact of online platforms<sup>17</sup>.

### **Acknowledgements**

The authors would like to thank the Zuyderland Hospital for their assistance regarding the inclusion of the participants and to ARISTOCO and 4WebCOM for developing the online community care platform.

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# Chapter 3

A typology of online care platforms for community-dwelling older adults in the Netherlands:

A scoping review

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*Gerontechnology 2019;18(2):122-141*

## Abstract

### Background

Due to demographic transitions and budget restraints, it is now necessary to search for comprehensive new strategies, in order to constitute a sustainable healthcare system. Recently, various online care platforms for community-dwelling older adults were introduced in several European countries. These platforms have aimed at solidifying social cohesion in the community, so as to support the older adults in coordinating or managing their care and to enhance the self-reliance of these older adults. Consequently, these platforms might contribute to a more sustainable healthcare system. The main research question of this study was twofold: Which online care platforms for older adults are available in the Netherlands and what are their characteristics?

### Methods

The researchers have performed a scoping review of the online care platforms in the Netherlands, according to the six steps of Arksey & O'Malley (2005), which were as follows: (1) Identifying the research question; (2) Identifying any relevant studies; (3) Selecting the studies; (4) Charting the data; (5) Collating, summarising and reporting on the results; together with (6) consultations with the relevant stakeholders. The study searched for evidence in online scientific databases (Phase 1) and on the Internet (Phase 2). The relevant studies that were published between February 2012 and October 2017 were included.

### Results

The review resulted in an overview of 21 care platforms, for which 3 types were identified: (1) Community Care Platforms; (2) Care Network Platforms; and (3) System Integrator Platforms.

### Conclusion

This typology of platforms can guide users – for instance, older adults, care professionals, informal caregivers and municipalities, in choosing a suitable care platform, i.e. the typology gives users insight into the functionalities, goals and target groups which allows them to choose a platform that matches their needs. As far as the authors know, no studies have previously reported on the effects of the online care platforms for older adults in the Netherlands, so further research is required on their impacts and on their benefits.



## Introduction

Due to an ageing of the European population, transitions in long-term care have been implemented in which governments have promoted deinstitutionalisation, by emphasising individuals own responsibilities and by activating citizens to help each other<sup>1-5</sup>. These transitions have major consequences for the positions and the roles of community-dwelling older adults. Care responsibilities are shifting from the health care system, to the older adults themselves, and their social networks. Self-management competencies are highly valued and these older adults are encouraged to live independently in their own place for as long as possible, i.e. they are encouraged to 'age-in-place'<sup>6,7</sup>.

In this more 'participatory society', it is now necessary to search for comprehensive new and smart strategies, in order to constitute a sustainable and affordable health care system. Technology can support these strategies. A technological solution, whereof many were recently introduced in several European countries (e.g. Germany<sup>8</sup>, England<sup>9</sup>, Belgium<sup>10</sup> and the Netherlands<sup>11-14</sup>) are online care platforms for community dwelling older adults. These online platforms for older adults have various objectives: a) to solidify social cohesion in the community; b) to support older adults in coordinating or managing their own care; and c) to enhance the self-reliance of these older adults. Consequently, these online platforms might possibly contribute to a more sustainable healthcare system<sup>15-17</sup>. However, there has been little research conducted on the availability of online platforms for older adults and their characteristics, functionalities, usability and effects, in order to guide older adults in choosing a suitable platform. There is a large number of platforms in the Netherlands and the majority of them suggest that they aim to support community dwelling older adults. As they all communicate about this objective in the same way the misconception arises that they also work in the same way. That however, is not the case: their actual aims and functionalities vary. The authors believe that knowledge about the Dutch 'case' is relevant for the end-users, start-ups, additional research groups and the policy makers, in other countries as well.

The main research question of this study was twofold: Which online care platforms for older adults are available in the Netherlands and what are their characteristics?

## Methods

A scoping review<sup>18-20</sup> was conducted, in order to summarise ‘the state of the science’ regarding the online care platforms for older adults in the Netherlands and to provide an overview of these platforms. Scoping reviews are “specifically designed to identify gaps in the evidence base (...) and they may also summarise and disseminate disseminate research findings”<sup>18</sup>. This scoping review was performed according to the six steps of Arksey & O’Malley<sup>18</sup>, which were as follows: identifying the research question; identifying the relevant studies; selecting the studies; charting the data; collating, summarizing and reporting on the results; together with consultations with the relevant stakeholders.

### Identifying the research question

This research focused on answering two research questions: (1) Which online care platforms for older adults are available in the Netherlands? and (2) What are their characteristics?

### Identifying the relevant studies

In this review, different sources were consulted when searching for the researched evidence: that is, online scientific databases for the scientific literature (Phase 1) and on the Internet for the ‘grey-literature’ (Phase 2).

#### *Phase 1 – Database searches*

First of all, a review of the scientific literature in the databases of PubMed and PsycINFO was conducted. In order to identify the study’s population and to demarcate the geographical area, the MESH terms “aged” and “aged 80 and over” were combined with the term “Netherlands”. So as to keep the scope for the research as wide as possible, the online care platforms were specified, by using broad terms such as “ICT-platform”, “online platform”, “eHealth platform”, “eCommunity”, “online health”, “web based platform”, “services platform”, “web based health”, “web based social networking”, “online care communities”, “online social health”, “healthcare platform”, “care platform”, “self-management tools” and these related MESH terms were combined with OR. The searches for the study’s population and the interventions were, consequently, combined with AND – and they were restricted to approximately a 5 year period (February 2012 - October 2017). The searches were restricted to a 5 year period as the goal was to provide a recent overview of the Dutch field of Online Care

Platforms. All of this resulted in the final search. The references in the articles were checked for other relevant platforms.

### ***Phase 2 – Searching on the internet***

In the second phase, the researchers extensively searched on the Internet (via Google and Google Scholar) for reports, web pages, or online descriptions, about the online care platforms. While searching for this grey-literature, the same terms that were used during the search in the PubMed and PsycINFO databases were employed. The references in the documents were again checked for other relevant platforms. In this second phase, 3 researchers worked together in reviewing and assessing the online platforms, i.e. they all independently searched for information on the online platforms and they convened on a regular basis, in order to align their findings on the terminologies, the categories and the characterisations of the data. These researchers applied ‘inductive reasoning’, moving from specific observations, to broader generalisations<sup>21</sup>.

### **Selecting the studies**

A report on an online platform, whether it was a scientific article or not, was suitable for inclusion, if it met the following inclusion criteria. The online platform: (1) had to have at least two functionalities, e.g. information on community activities and a tool to communicate with a caregiver (a video calling service); (2) had to be easily accessible for older adults and be available for everyone who wanted to subscribe; (3) had to be aimed at improving (health) care and/or wellbeing; (4) had to be interactive; and (5) had to be available and currently in use in the Netherlands. Researched documents were excluded if the online platform: (1) was intended for older adults, suffering from specific conditions or diseases (e.g. diabetes, heart disease, dementia, and so forth); and (2) was merely intended for older adults living in a nursing home or in a care facility (i.e. for certain clients or members only).

### **Charting the data, summarising, and reporting on the findings**

Each included online platform was described according to a set of 20 characteristics (Table 3.1), such as the platform’s goal, its target group, its end users and its functionalities. As described in Phase 2, these characteristics were determined by using an inductive approach, for instance, the characteristics were extracted from and observed in the collected data about online platforms. The 3 researchers from Phase 2

independently described each platform. These descriptions were then compared; any discrepancies were solved by discussing the most appropriate and suitable description.

**Table 3.1** Description of the Platform Characteristics

<b>Platform characteristics and their description</b>
The name of the online platform.
The name of the platform's owner or administrator (e.g. company name).
Goal of the platform.
Target group: the people for whom the online platform is (initially) intended.
End users: the people who actually use the online platform (this may include other people than the targeted group).
Information*: functionalities that provide information to the user (one-way).
Communication*: functionalities that enable the exchange of information between two or more users (two-way).
Commercial services*: functionalities in which entrepreneurs or companies offer their product(s) with the objective of making a profit.
Community care*: Functionalities that aim to improve social cohesion on a neighbourhood level, or that aim to improve the wellbeing ("happiness") and the comfort of the users.
Health care services*: functionalities that aim to support the users in their health (care).
Monitoring*: functionalities that enable users, or people in their network, to notice changes in their personal environment or physical wellbeing.
Recreation: functionalities that enable users to amuse or entertain themselves.
Focus of the platform: whether the platform is more community oriented, health care oriented, focussed on supporting care-networks, or on a combination of the preceding.
Personalisation: whether the user has the possibility to customise the platform to their own preferences.
Status: the development stage of the platform and its lifespan.
Distribution/range: geographical area in which the platform is most used, number of users, etc.
Costs: costs for the purchase and the maintenance of the platforms' software and the expenses for the end user.
Hardware/software: whether the online platform is accessible via an application, a website or by special hardware.
Privacy: information about the availability of a privacy statement or policy.
Evaluation: the extent to which (the effects of) the online platform has been evaluated.

\* = platform functionality, which was taken into account during the selection procedures

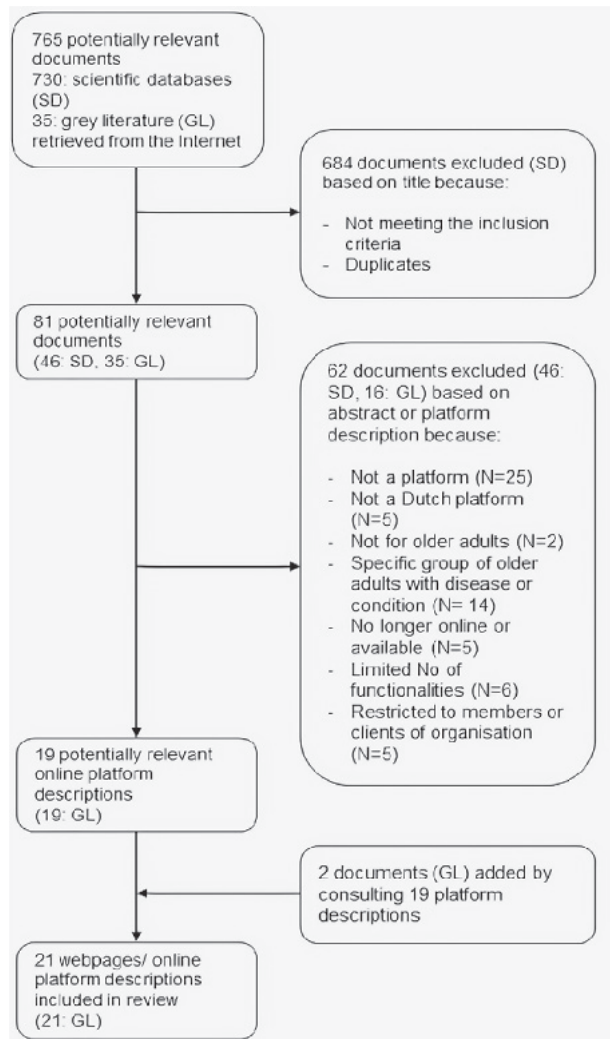
## Consultations with the relevant stakeholders

As proposed by Arksey & O'Malley<sup>18</sup>, it was of value to involve the stakeholders, in order for them to provide insights beyond those that were found in the literature searches. Therefore, the description of each online platform was presented to the owner or the administrator via e-mail, so as to confirm the study's findings. Eventually 19 administrators responded to our request and provided feedback. This feedback and the additional information details were, if relevant and applicable, processed into the final platforms' description.

## Results

### Selection process

The searches in the scientific databases and on the Internet generated 765 potentially relevant documents; based upon their title, 81 abstracts and their platform-descriptions were examined (Figure 3.1).



**Figure 3.1** Flowchart of the selection process.

Eventually, no scientific articles were included after reviewing these 81 abstracts, because they were not about online care platforms or because they were about platforms that were intended for older adults suffering from a specific disease or condition. Thus, the selection process finally yielded 21 documents for the review and they were all retrieved from websites or from online descriptions of their platforms.

## Characteristics of the online platforms

The characteristics of the 21 included platforms are presented in Tables 3.2 and 3.3, from which 3 types of platforms were able to be distinguished: Community Care Platforms (9), System Integrator Platforms (1) and Care Network Platforms<sup>11</sup>.

### *Community Care Platforms*

These 9 platforms<sup>10,22-32</sup> were all designed, so as to support local communities, by enhancing social cohesion and by encouraging informal care. In order to obtain the objective of a more ‘cohesive community’, these platforms predominantly offered online functionalities regarding the domains of ‘information’, ‘communication’, ‘commercialism’ and ‘community-care’. A few examples of the aforementioned functionalities were: a) local yellow pages, an online database of local entrepreneurs, shops and services, which granted older adults the opportunity to remotely employ services; b) social marketplace (Figure 3.2), in which the older adults could ask for, or be offered help, regarding “care-related” issues, such as assistance with a garden’s upkeep, or shopping for groceries; c) local calendar, in which the older adults could find out about information regarding various activities – for example, groups and/or meet ups regarding hiking, playing card games and creative crafts and so on.

### *System Integrator Platforms*

One platform, the Cubigo platform<sup>33</sup>, was a system integrator: a platform which had the capability of integrating existing services and applications into their own software. This platform had a large number of functionalities, within all of the domains that were taken into account during the selection procedure, such as ‘information’, ‘communication’, ‘commercialism’, ‘community care’, ‘health care’ and ‘monitoring’. A few exemplar functionalities of the platform were: (a) calendar, a customisable ‘app’, into which several calendars could be integrated, for example, a personal calendar and a local (activity) calendar; (b) comfort and care services (Figure 3.3), a catalogue and a web shop for numerous care services; and (c) video calling service, a visual communication tool, by which the older adults could contact people in their network.

**Table 3.2** Characteristics of the Online Care Platforms (Part 1).

No.	Platform	Goal	End users
<b>Category 1 community care</b>			
1	Community Welfare	To enhance social cohesion on a neighbourhood level.	Local residents, people in need of care, volunteers, social workers, entrepreneurs and communities.
2	Trivici Welfare Portal <i>According to the example of the 'Burum Portal'</i>	To enhance social cohesion on a neighbourhood level.	Local residents, healthcare and welfare organisations, housing corporations and local municipalities.
3	Son and Breugel Connects	To enhance the welfare of the community through connecting local residents and through mobilisation.	Local residents, networks and entrepreneurs.
4	Sevagram Connect	To enhance mutual (informal) care by 'connecting' (health) care demands and informal caregivers.	Local residents, healthcare providers, Sevagram's clients, informal caregivers and entrepreneurs.
5	My Neighbourhood	To offer an adequate and an accessible interactive communication channel for a community (i.e. to integrate services and information).	Local residents, entrepreneurs, health and welfare organisations, municipalities
6	Community Connect	To connect local residents by bringing together (health) care demands with (informal) services.	Local residents, resident-organisations, non-profit organisations, local initiatives and municipalities.
7	Region Online	To support local communities in creating a better and a more social living environment.	Local residents, entrepreneurs, non-profit organisations and municipalities.
8	Wiki Community	To enhance self-management competencies of the local residents and to facilitate these residents to age-in-place.	Local residents, informal caregivers, healthcare organisations and volunteers.
9	WeHelpen	To encourage and facilitate community-dwellers in helping each other.	People who help someone or receive help (e.g. informal caregivers, volunteers and people in need of care).
<b>Categorie 2 system integrator</b>			
10	Cubigo	To support vulnerable community-dwelling people in their independence and their health, by stimulating self-care and providing reliable information, products and services.	Older adults, informal caregivers volunteers, municipalities, service providers, healthcare and welfare organisations.

Table 3.2 (continued)

No.	Platform	Goal	End users
<b>Category 3 care networks</b>			
11	Caren	To facilitate and support people in the need of care and at coordinating and arranging their own (health) care	People in need of (health) care, informal caregivers, volunteers, healthcare professionals, social workers.
12	HelloCare	To attune their (health) care with family members, acquaintances, friends and home care and to facilitate collaboration.	People who live at home and who are in the need of (health) care. Informal caregivers and healthcare professionals.
13	Companion	To facilitate older adults to age-in-place.	Older adults, their informal caregivers and healthcare professionals and social workers.
14	Quli	To enhance self-management competencies of frail individuals.	People in need of (health) care, informal caregivers, family, friends, healthcare professionals, healthcare organisations and municipalities.
15	ShareCare	To support informal caregivers who wish to coordinate their collaborations and (health) care with a person they care for.	People in need of (health) care, informal caregivers, family, friends, volunteers, healthcare professionals, social workers, healthcare organisations.
16	Fello	To activate and support the social networks of people who are in need of care.	People in need of (health) care, informal caregivers, family.
17	FamilyNet	To support informal caregivers and healthcare professionals who wish to coordinate their collaborations and (health) care.	People in need of (health) care, informal caregivers, healthcare professionals and organisations.
18	Caregivers Plan	To facilitate older adults to age-in-place by bringing all of the caregivers together in one online environment.	Older adults, informal caregivers, volunteers, friends, healthcare professionals and healthcare organisations.
19	MIbida	To improve the collaboration and the communications among informal caregivers and thereby contributing to the quality of life of those people in the need of care.	People in need of (health) care, informal caregivers, family, friends, healthcare professionals and home care.
20	BetterApp	To support individuals in actively working on their (health) goals in a collaboration with informal caregivers and healthcare professionals.	Vulnerable individuals, informal caregivers and healthcare professionals.
21	Netty	To improve the collaboration and the communications among informal caregivers and healthcare professionals, thereby contributing to the quality of life of people who are in need of care.	Informal caregivers, healthcare professionals, family, friends. People in need of care who themselves do not use the platform.



**Table 3.3** Characteristics of the Online Care Platforms (Part 2).

No.	Information Platform functionalities	Communication	Commercialism	Community care	Healthcare	Monitoring	Recreation
1	a. Local news b. Local yellow pages c. Local calendar d. Profiles of local residents e. Weekly newsletter	a. My neighbourhood b. Messages	a. Information on local entrepreneurs b. Local products	a. Social marketplace	a. Personal healthcare file	- <sup>1</sup>	a. Blog
2	a. Local news b. Local calendar c. Local yellow pages d. Local newspaper e. Weather f. My network	a. Video calling (e-consult) b. E-mail	a. Local taxi service	a. Social marketplace	a. Website: My Health b. Health care questions	a. Blood pressure b. Medicines	a. Book exchange b. Photo archive c. Twitter d. Audio books e. Internet
3	a. My profile b. My network c. Local news d. Local yellow pages	a. My networks b. My activities c. Local calendar	a. My services (e.g. local products, shops etc.)	a. My bulletin board (local classifieds and forums)	a. Social marketplace	-	a. My social media b. Local TV channel (live-stream) -
4	a. Local news b. Local calendar c. Library of knowledge	a. Knowledge centre ('ask questions about anything') b. Commercial marketplace	a. Social deals (information on local offers) b. Commercial marketplace	a. Social marketplace	-	-	-
5	a. Local calendar b. Local news c. External information (e.g. information from the municipality) d. Local yellow pages	a. Forum for neighbourhood improvements b. Email c. Video calling service (Skype)	a. Bulletin board b. Local services c. Professional help (health and welfare services)	a. Social marketplace b. Social yellow pages	a. Health calendar (private online setting to correspond about health related matters, e.g. appointments)	-	a. Local stories b. Local photo and video album

<sup>1</sup> - No information was available about this characteristic.

Table 3.3 (continued)

No.	Information	Communication	Commercialism	Community care	Healthcare	Monitoring	Recreation
<b>Platform functionalities</b>							
6	a. Local yellow pages	a. Local calendar b. Local online community (Facebook and Twitter) c. Local forum and messages	a. Commercial marketplace	a. Social marketplace	-	-	-
7	a. My profile b. Networks c. Local yellow pages (google maps) d. Local news (stories, blogs)	a. Local calendar b. Forum for neighbourhood improvements c. Collaboration platform (on local initiatives and projects)	-	a. Social Marketplace	-	-	-
8	a. Contacts b. Profile c. Personal files d. Local calendar e. News f. Weather g. Public transportation services	a. Video calling service b. Personal calendar c. Messages d. Email	a. Grocery service b. Local taxi service c. Meal service	a. Social marketplace b. Neighbourhood Watch c. WeHelen (integration with online platform no. 9)	-	a. Video sitter	a. Games b. Audiobooks c. TV d. Photo album e. Facebook f. Radio g. Wikipedia h. Stories i. Personal diary
9	a. My profile	a. Calendar b. Messages c. Contacts	-	a. Care needs (of the user and of other members) b. Help offers c. Help networks d. Recommendations (of others for the user)	-	-	-

Table 3.3 (continued)

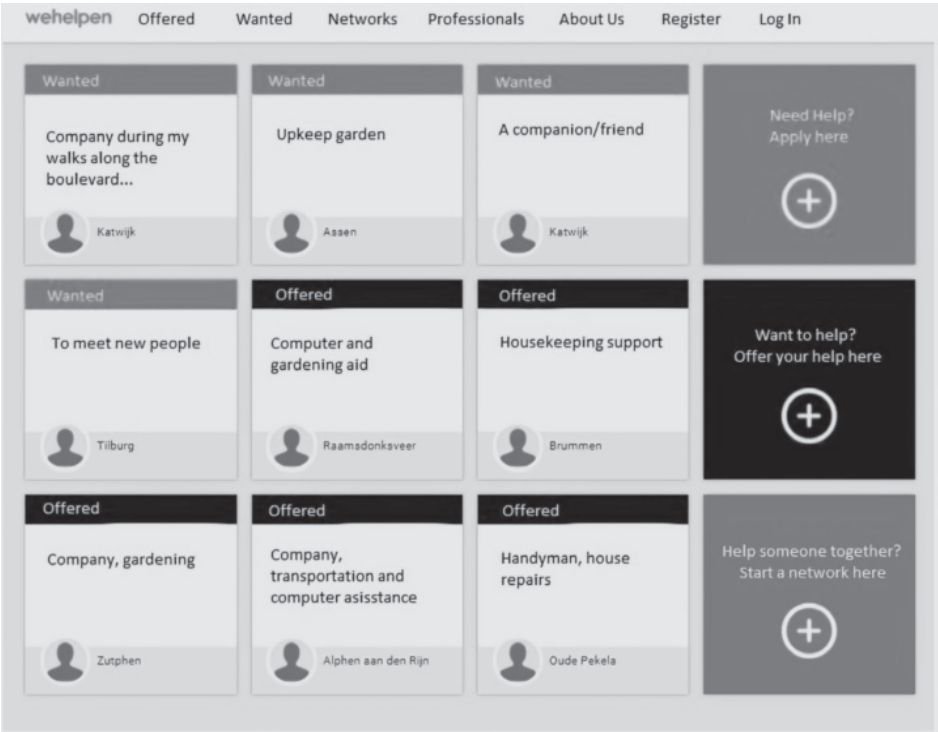
No.	Information	Communication	Commercialism	Community care	Healthcare	Monitoring	Recreation
<b>Category 2 system integrator</b>							
10	a. My neighbourhood (local news, calendar and local forum) b. Weather c. Contacts d. Notes e. Disease specific information (depending on the provider)	a. Messages b. Video calling service c. Forum d. Calendar (to share) e. Communication notebook f. Link to social media	a. Comfort and care services (meal service, online grocery shopping, etc.). b. Custom functionality (e.g. by community care organisations)	a. Social marketplace	a. Personal health record data b. Medication schedule c. Medication reminder d. My health measurements e. Panic button	a. LiveSafe (GPS tracker) b. YouTube c. Games	a. Radio b. YouTube c. Games
<b>Category 3 care networks</b>							
11	a. Profile b. Contacts	a. Video calling service b. Messages c. Care calendar (to coordinate with the care networks)	-	-	a. Log b. Notes c. Healthcare file (option to register and monitor health measurements) a. Medication	-	a. Photo album
12	-	a. Contacts b. Tasks c. Meetings and appointments d. Timeline e. Log	-	-	a. Mobile alarm	a. Forum and photos	
13	a. Weather b. Local news c. Calendar (viewing-only for the end-user) d. Quote of the day	a. Video calling service (inbound only) b. Messages (send and receive) c. Text to speech	a. Meal and grocery service	a. Online church service	a. Log	a. Medication reminder b. Check In – the older adult has to accept a check-in every morning (safety measure).	a. Games b. Digital photo frame c. Photos and videos d. Internet browser

Table 3.3 (continued)

No.	Information	Communication	Commercialism	Community care	Healthcare	Monitoring	Recreation
<b>Categorie 3 care networks</b>							
14	a. Information on healthy living/aging b. Instruction videos on the instrumental activities of daily living c. Calendar and tasks d. Contacts e. Bookshelf f. Social yellow pages	a. Video calling service b. Messaging c. E-mail d. Forum	-	a. Social marketplace b. E-coach	a. Personal health record	a. Sensor technology	a. Games (educational) b. App store c. Videos (send and receive)
15	a. Patient profile b. Overview members c. Notifications	a. Calendar (shared) b. Chat c. Group-email d. Group-texting e. Media (record video message)	-	-	-	-	a. Media (photos videos and audio files)
16	a. Contacts b. News	a. Calendar (shared) b. Messages	-	a. Tasks (divided among network members)	-	-	-
17	a. Contacts b. Profile of healthcare organisations	a. Exchange files b. Messages c. Calendar d. Forum e. Group message (text)	-	-	-	-	a. Photos and videos (share)
18	a. Profile b. Network overview	a. Calendar b. Messages	a. Services	-	-	-	-
19	a. Weather b. Bulletin board c. Personal newspaper	a. Video calling service b. Messages c. Chat d. Calendar	a. Medication reminder (pharmacy service)	-	a. Care notebook (track actions of the caregivers) b. Personal healthcare record	Check-in: the patient has to accept a check-in every morning (safety measure)	a. Family (photos and stories) b. Radio c. Games d. Digital photo frame

Table 3.3 (continued)

No.	Information	Communication	Commercialism	Community care	Healthcare	Monitoring	Recreation
<b>Category 3 care networks</b>							
20	a. Progress overview	a. Set goals b. Set activity c. Score of the day d. Network (share progress) e. Timeline a. Calendar	-	-	a. Electronic health record	-	-
21	a. Internet URL b. Group members		-	-	a. Dashboard (healthcare organisations and municipalities)	-	-

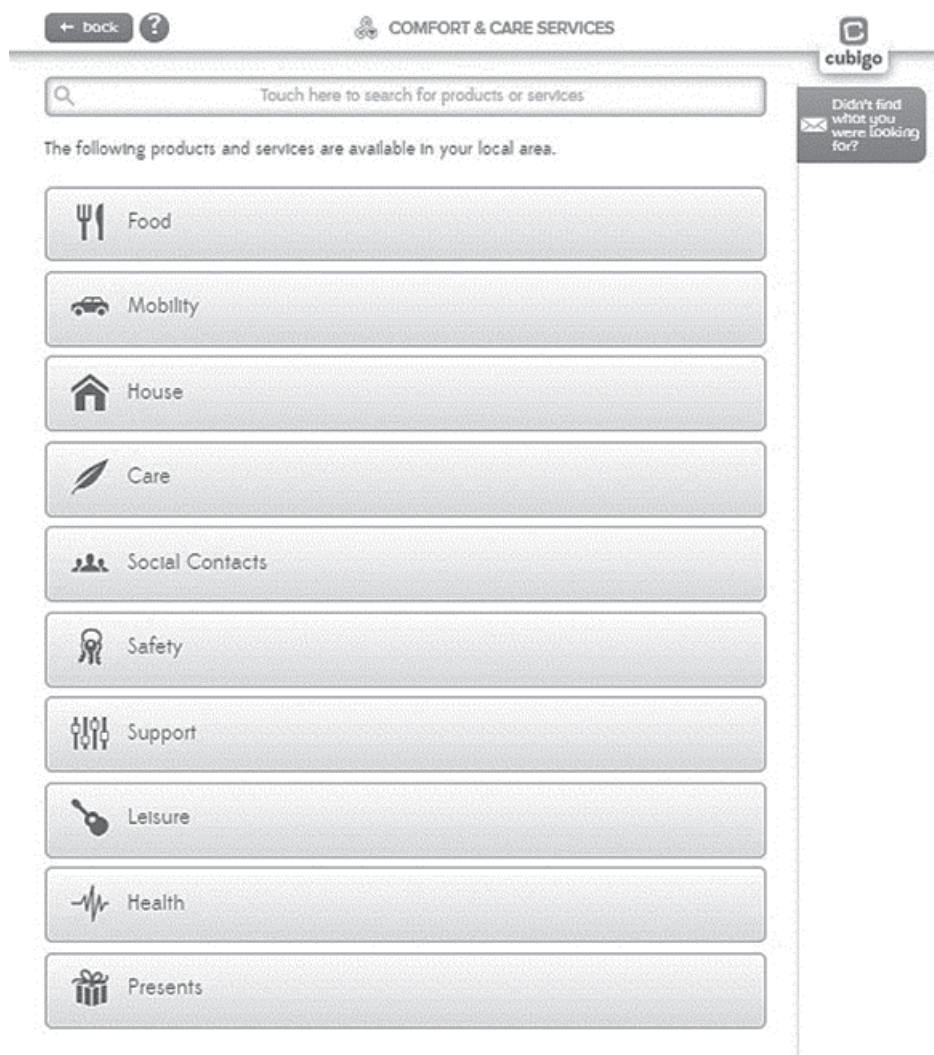


**Figure 3.2** Screenshot of the functionality of the ‘Social Marketplace’ platform.

### *Care Network Platforms*

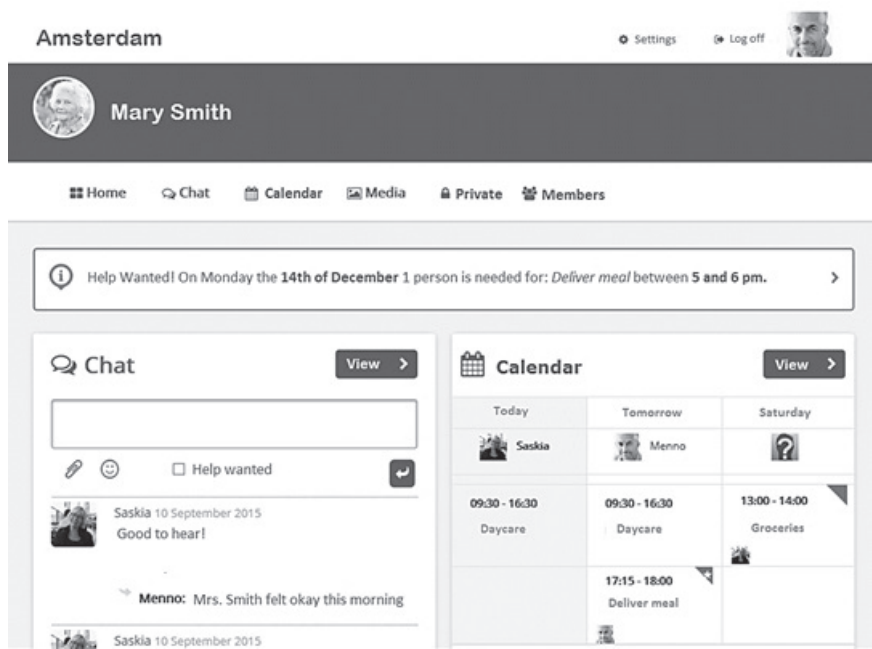
The remaining 11 platforms<sup>34-44</sup> were mainly designed to support (informal) caregivers who wished to coordinate assorted collaborations and (health) care issues for an older person. Consequently, these platforms predominantly offered online functionalities in the domains of ‘information’ and ‘communication’. The ‘shared calendar’ (Figure 3.4), by which caregivers could coordinate their care activities, was a key functionality in these care-network platforms.

Table 3.4 provides many additional platform characteristics. The majority of the platforms were established between 2010 and 2015. The number of registered individuals varied substantially between the platforms. ‘Small’ platforms had an overall of 1100 to 6000 members and the ‘larger’ platforms had an overall of 30000 to 65000 members. Some platforms reported on their ‘distribution range’, by citing the number of organisations or neighbourhoods which had adopted their platform (e.g. 30 municipalities, 10 neighbourhoods or 500 healthcare organisations).



**Figure 3.3** Screenshot of the menu functionality of the 'Comfort and Care Services' platform Cubigo.

The costs for the purchase and the maintenance of the online platforms' software were mostly reimbursed by neighbourhood organisations, (health) care organisations, or by municipalities (17 out of the 21 platforms). These organisations paid fees that ranged from €500 to €5000 per year. In these particular cases, the use of the platform was free of charge for the older adults. In a few cases, (e.g. Companion or Caregivers Plan) the older adults themselves paid an annual fee for them to use a platform. These costs then ranged from €60 to €240 per year.



**Figure 3.4** Screenshot of the functionality of the 'Shared Calendar' platform ShareCare.

A majority of the platforms (N=17) operated by using a web-based format and they were independent of any substantial hardware. Of these, 6 could also be accessed via applications for mobile devices (Android and iOS). Three of these platforms were primarily designed as an application for mobile devices, but nonetheless, they could also be accessed via a regular website. Only 1 platform operated on a hardware device and it was not available via a regular website. Most of the platforms (N=15) had a statement, or information available, regarding 'privacy' and the way in which the personal data was used or protected. Furthermore, many online platform owners (N=15) included end-users' requirements, experiences and feedback, regarding the 'usability and the content' of their website, for the development and the improvement of their online platform.



**Table 3.4** Characteristics of the Online Platforms (Part 3)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
1.	Community Welfare was established in 2014, is available on a national level and has been implemented in 411 Dutch neighbourhoods.	Use of the platform is free for the end-users.	The platform is web-based and independent of hardware.	The platform has a privacy statement available on their website.	The platform is frequently updated, based upon user experiences. No research was performed or available.	The platform has an ANBI status. It is non-profit and it provides various offline activities, in order to enhance the symbiosis between offline and online social care.
2.	The Burum Portal was established in 2013. 4 different organisations have had a platform developed by the Trivici Welfare Portal.	The 'basic' services of the portal are free for the end-users. Certain paid services are optional.	The platform is web-based and is independent of hardware.	-	-	-
3.	Son and Breugel Connects has 2100 members (circa 30% of the local residents).	Use of the platform is free for the end-users.	The platform is web-based and is independent of hardware. It can also be accessed via applications for mobile devices (Android and iOS).	The platform has a privacy statement and information regarding the use of personal data (available on the platform's website).	The platform is frequently tested and reviewed by a panel of end-users.	The platform is an initiative of the local residents and it is financed by the foundation 'Son and Breugel Connects'. The platform provides various offline activities to enhance the symbiosis between offline and online social care.
4.	Sevagram Connect was established in 2015 and it is mostly used by the residents of one city (Heerlen). The information on Sevagram Connect can be accessed by approximately 2000 employees of Sevagram Connect (the healthcare organisation) and 1100 volunteers, clients and their informal caregivers.	Use of the platform is free for the end-users. Local entrepreneurs or organisations who wish to display their products or services on the platform have to choose a 'subscription' and pay an annual fee (ranging from €275 to €500).	The platform is web-based and it is independent of hardware and it can also be accessed via the applications for mobile devices (Android and iOS).	-	-	Sevagram Connect also facilitates recreational activities (no online functionality is designed for this service). The software is merely considered as the means to an end (i.e. to connect). Individuals can use the services without ever consulting the website or the application.

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
5.	My Neighbourhood was established in 2011 and it is currently used by 30 municipalities in the Netherlands and in Germany.	Use of the platform is free for the end-users. The custom online platform is €48.50 per month, including software updates and the technical upkeep.	The platform is web-based and it is independent of hardware.	The platform has a privacy statement available on their website.	Research by a Graduate Student Sociology (Radboud University Nijmegen).	My Neighbourhood is a "method" in which an initiator plays an important role (e.g. a municipality, a local resident, a welfare organisation). Each community or neighbourhood can have their own custom online platform. The responsibility for the (success of) the online platform lies with the initiator. The platform is accompanied by a constructive communication approach.
6.	Community Connect was established in 2012 and it has been implemented in 10 neighbourhoods of the Dutch City Utrecht.	Use of the platform is free for the end-users. The platform is financed by the membership fees of non-profit organisations or local entrepreneurs who display their services on the platform (the membership fees range from €50 p.a. for local residents to €200 p.a. for organisations).	The platform is web-based and it is independent of hardware.	The platform has a privacy statement available on their website. The users remain the owner of their own online content. This content is saved on private servers and it is not shared with third parties.	In each neighbourhood, the platform collaborates with so called development groups (local residents and professionals who give their opinions on the platform's functionalities and operation).	Community Connect employs ambassadors in every neighbourhood and it employs a community-driven-development process. Every neighbourhood can use Community Connect to create their own custom online neighbourhood platform.

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
7.	Region Online was established in 2015 and it has been implemented in 19 neighbourhoods (mainly in the city of Amsterdam).	Use of the platform is free for the end-users. A provider of the Region Online platform (i.e. an organisation or a person that employs the software) pays approximately €2000 p.a. This provider also becomes a member of the Region Online Cooperation.	The platform is web-based and it is independent of hardware.	The data is encrypted by using SSL certificates.	The Amsterdam University of Applied Sciences (Division School of Digital Media and Creative Industries) performs research on the ways in which digital tools can strengthen the urban networks. All results from this study are processed adjustable and by Region Online.	Region Online originated as a local website of a single neighbourhood (IJburg, Amsterdam). Several organisations were also interested. Consequently, the format was made available for every community who wished to adopt this 'method'. The platform's technology is flexible, modular, study are processed adjustable and by Region Online.
8.	Wiki:Community was established in 2012 and it is mainly used in the Dutch province of Brabant.	Use of the platform is free for the end-users. Additional services include a monthly fee (e.g. video sitter €14.95). The costs for the video sitter (and other services) are dependent on the provider (i.e. the fees may vary) and are not fixed or charged by the Wiki:Community.	The platform is web-based and it is independent of hardware.	The platform has a privacy statement and information regarding its 'terms and conditions'. These are available on their website.	Wiki:Community has developed their online platform based on the input and the needs of the end users. Tilburg University has evaluated the platform.	Wiki:Community has an open structure which enables integration with other online systems: other applications or external functionalities are integrated into the Wiki:Community platform, instead of being merely linked to an URL.
9.	WeHelpen was established in 2012 and it has 31000 members.	The use of the platform is free for the end-users.	The platform is web-based and it is independent of hardware.	The platform has a privacy statement available on their website.	-	In order to ensure that WeHelpen is implemented correctly, they have developed a toolkit. All requests for help and help offers are monitored by an appropriate language.

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
10.	Cubigo was established in 2011 and it is available worldwide. The platform is in use in various areas of the Netherlands, Belgium and the United States.	The use of the platform is free for the end-users. Local entrepreneurs or commercial organisations pay a monthly fee of €12.50 (to have their own functionality on the platform). The provider of the Cubigo platform (i.e. the organisation which employs the software) pays approximately €5000 p.a.	The platform is web-based and it is independent of hardware and it can also be accessed via the applications for mobile devices (Android and iOS).	Cubigo follows privacy laws; the users retain the ownership of their data and they decide whether or not to share this data. The data is encrypted and it is only accessible for authorised people. The data travels over secure 'lines'. The data is not used or sold for commercial purposes.	The platform is continuously evaluated and improved based upon the user's requirements. In a collaboration with several research facilities the needs of the older adults regarding this online platform were examined.	Cubigo has an open structure, i.e. the platform integrates existing services and applications into their own software. The users can individually determine the layout of the platform's main menu.

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
11.	Caren was established in 2012 and it is only available in the Netherlands. 180 healthcare organisations (the intensity of use varies) and 65000 individuals use Caren weekly.	The use of the platform is free for the end-users.	The platform is web-based and it is independent of hardware.	Caren only has a little information published regarding privacy: The website services have an https connection. The data is saved on separate servers.	Caren was tested by a healthcare organisation (Zorggroep Groningen). Employees and clients of this organisation were excited about the possibilities, the transparency and the straightforwardness of Caren.	The Caren Fund supports informal caregivers: in other words, someone who voluntarily cares for another can receive a small grant from the Caren Fund. The platform offers an online personal health environment. Personal health data can be copied to Caren. The person in the need of care creates and coordinates their own Caren environment and they have control over the data and they decide which individuals gain an access to it. There is extensive online support for the user (the person in the need of care).
12.	HelloCare was established in 2012 (until 2016, it was known under a different name, ConnectedCare).	The use of the platform is free for the end-users. Certain modules can be accessed for a fee (e.g. mobile alarm). (Health) care professionals pay a monthly fee and healthcare organisations pay fees for implementation activities.	The platform is web-based and it is independent of hardware.	The platform has a privacy statement available on their website.	-	-

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
13.	The Companion Tablet has been available since 2014.	The (hardware) tablet costs €299. A monthly fee is paid for 2 informal caregivers to gain access to the administrator's portal (€12.95). Every extra administrator costs are €2.50 (PPPM).	The platform is a hardware solution, i.e. it is a tablet computer.	It is only merely mentioned on the platform's website is that the privacy of its users is respected.	In July 2014, the Companion was tested by the Dutch Consumer Association. Furthermore, a test was performed (the proof of concept) in 2014 in a collaboration with a healthcare organisation and the Dutch municipality of Bloemendaal (N=50).	Older adults who use the Companion tablet have limited administrative 'rights'. The platform's settings are modified by an informal caregiver (e.g. a family member). They, for example, set alarms, provide the calendar with content and/or choose a photo for the digital photo frame. Healthcare and welfare organisations and municipalities have the option to develop their own functionality, in order to be integrated into the Companion tablet.
14.	Quli was established in 2014 and it is used (2015) by 21 healthcare organisations.	The use of the platform is free for the end-users. (Healthcare) organisations pay a fee in proportion to their number of users.	The platform is web-based and it is independent of hardware and it can also be accessed via the applications for mobile devices (Android and iOS).	The platform has a privacy statement available on their website. Quli offers 'privacy by design', in which case, the user determines whether certain contents are shared with third parties.	In 2015, 50 clients of a healthcare organisation filled out a questionnaire about self-management competencies in relation to Quli. Additionally, the usability of the platform was tested with the end-users. Based upon the results, Quli 2.0 was launched on the 1 <sup>st</sup> of October 2016.	Quli is capable to integrate several electronic health records. Quli aspires to collaborate with Pazio (the healthcare platform) in the future.

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
15.	ShareCare was launched in 2007 (since 2011, it has been operated by the company, Simac Healthcare). ShareCare has been employed by various hospitals, municipalities and healthcare organisations.	ShareCare is a paid service, which is bought by healthcare organisations or municipalities, allowing their citizens and patients to use the platform free of charge. Private individuals pay €69.95 per year.	The platform is web-based and it is independent of hardware and it can also be accessed via the applications for mobile devices (Android and iOS).	The user data is encrypted and it is stored on private servers. The privacy policy is extensively explained in their 'terms and conditions'.	ShareCare has been redeveloped three times, based upon usability studies.	-
16.	Fello was established in 2015 and it has more than 2800 users.	The use of the platform is free for the end-users.	Fello was primarily designed as an application for mobile devices (Android and iOS), but it can also be accessed via a regular website.	The platform has a privacy statement available on their website.	Fello frequently asks users to evaluate the usability and content of the platform (via short online questionnaires).	Fello was formerly known under a different name: 'Mantellink'.
17.	FamilyNet was established in 2006 and has been employed by over 500 healthcare organisations in the Netherlands and in Belgium.	Healthcare organisations pay €495 per year (in this case, clients and families may use the platform free of charge). Private individuals pay €4.95 per month.	The platform is web-based and it is independent of hardware.	FamilyNet characterises itself as a safe and reliable software program (ISO 2700, NEN 7510).	-	The prime customers of FamilyNet were originally healthcare organisations. Only at a later stage, the platform made its product available for private individuals.

Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
18.	Caregivers Plan was established in 2010.	Caregivers Plan costs €19.50 per month for private individuals (their expenses are sometimes reimbursed by the municipality).	The platform is web-based and it is independent of hardware.	Caregivers Plan characterises itself as a safe online environment, which can only be accessed by members of a private network.	-	Every member of the network (e.g. an older adult, an informal caregiver, or a professional) can take on the role of an administrator.
19.	MIbida was established in 2013. Approximately 300 healthcare professionals, 500 people in need of care, and 5000 informal caregivers use the platform.	MIbida costs €8.95 per month for an entire network (maximum no. of informal caregivers: 2. Every extra person costs €4.50 per month).	The platform is web-based and it is independent of hardware and it can also be accessed via the applications for mobile devices (Android and iOS).	Data is encrypted at all times and it is stored on private servers.	MIbida originated from 3 European research projects in the domains of the 'User-Centred Design, Ethics and Privacy'. The platform was repeatedly improved, based upon the experiences of several user panels (3 x N=20).	-
20.	BetterApp	Healthcare organisations pay €2500 for 10 'Better' licences (including support and implementation activities). The license for a professional costs €100 per year (unlimited no. of patients).	BetterApp was primarily designed as an application for mobile devices (Android and iOS). Caregivers and healthcare professionals can also access the application via the web-based platform.	The platform has a privacy policy available on their website (there are separate privacy policies for caregivers and clients).	The platform is frequently tested and reviewed by a panel of end-users.	BetterApp is capable of being integrated in the connections with several electronic health records.



Table 3.4 (continued)

No.	Status and distribution	Costs	Hardware/software	Privacy	Evaluation	Other details
21.	Netty was established in 2014 and it has 5000 end-users (collaborating with 6 health and welfare organisations).	Healthcare or welfare organisations who wish to adopt Netty pay €4850 every year (including support).	Netty was primarily designed as an application for mobile devices (Android and iOS), however, it can also be accessed via the web-based platform.	The platform has a privacy statement available on their website.	Netty is researched, in order to (1) investigate which clients and networks that Netty is suitable for; (2) determine which (health) care tasks can be best assigned to the network; and (3) determine the ways in which healthcare professionals can employ Netty in an efficient manner.	-

## Distinctive platform features

A few platforms were distinctive, since they had a wider employability and the possibility of being integrated with other systems. These were: (a) the Cubigo platform, which had an open structure, for instance, the platform could be integrated with existing services and applications, into their own software. The users could individually determine the layout of the platform's main menu. Thus, this platform could essentially be adapted to every wish and demand of the user, hence, the categorisation of this platform was determined as an 'integrator'; (b) the 'community-care' platforms, which classified their online platforms as a 'method'. These could be purchased and adopted by each neighbourhood. The initiators of this method (such as a municipality, a local resident, or a welfare organisation) were responsible for the success and the implementation of the platform. Consequently, these platforms seemed to be flexible and widely applicable for the various groups of older adults.

## Discussion

This review has provided an overview of the available Dutch online care platforms for community-dwelling older adults. Three types of platforms were identified: (1) Community Care Platforms, which attempt to enhance social cohesion, by interlinking the community-dwelling older adults, with neighbouring informal caregivers and by promoting local activities on a neighbourhood level; (2) Care Network Platforms, which provide older adults, professionals and informal caregivers, with tools to coordinate, plan and communicate about (health) care; (3) System Integrator Platforms, which interconnect a variety of functionalities. The majority of the online platforms operate by using a web-based format and are independent of any substantial hardware. The number of registered individuals varies per platform from between 1100 and 65000.

This scoping review has shown the existence of a considerable number of comparable online care platforms. It took a great amount of effort to retrieve the relevant information from the majority of these online platforms. Thus, for older adults, it may be challenging to discover what a platform's focus is and which available services it has. In addition, the researchers ascertained that some platforms were exclusively 'tailor-made' for small regions, such as for a neighbourhood.

Online care platforms for older adults have not yet been adopted onto a large scale, nor are they widely employed. These findings suggest that it is challenging to

successfully exploit these online care platforms. A system integrator, or a platform with an open source is, therefore, perhaps a promising ‘type’, since it has the potential to interconnect with a variety of functionalities, systems and moreover, it is likely to prevent fragmentation. In other words, this platform type can help to reduce the number of separate platforms and applications for older adults by integrating them within one single platform<sup>45-48</sup>.

Most of the online platform owners reported on and wanted the end-users’ requirements, experiences and feedback, on the ‘usability and the content’ of their website, for the development and the improvement of their product. This ‘owner research’ had the sole objective of determining whether a certain platform had a marketable value. No research by platform owners, or by research institutes, has yet focused on the impact, or on the effects that are related to the online platforms’ initial goals.

This study excluded several online platforms, because they were no longer available (i.e. ‘online’). Due to the fast changing world of (health) care innovations that coincides with a highly competitive environment and with a pressure to achieve results; these platforms ‘come and go’ quickly.

## Limitations of the review

Despite the study’s efforts to conduct a comprehensive search, some relevant online care platforms may not have been discovered. Furthermore, due to the lack of any previous research in this field, this scoping review has been based solely on grey-literature reports. All sorts of documents, such as web pages, reports, or online descriptions about these platforms, formed the basis for this review.

## Conclusion

This scoping review has shown the existence of a considerable number of comparable online care platforms, which can be divided into three types: Community Care Platforms, Care Network Platforms, and System Integrator Platforms.

The results have provided an insight into how these platforms should be categorised, which in turn, has allowed for one to have a more adequate discourse about this particular theme. The misperceptions regarding the nature and the capabilities of

these online platforms are now able to be somewhat alleviated. Furthermore, the typology of online platforms can better guide the interested users, such as the older adults, the professionals, the informal caregivers and the municipalities, in choosing a suitable platform.

Researchers should, to a greater extent, investigate if these online care platforms have added value and do indeed fulfil their promise in tackling the problems that have arisen due to the current transitions in health care. It should be investigated whether these online care platforms indeed do have a positive impact on aging-in-place, solidifying social cohesion, whilst at the same time, supporting older adults in coordinating or managing their care, as well as in enhancing the self-reliance of the older adults.

## **Acknowledgements**

The authors thank April Boessen and Ger Cremers for their help in reviewing and assessing the online platforms.

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# Chapter 4

Why do Dutch older adults use online  
community care platforms, or not?

A qualitative study

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*Submitted*

## Abstract

### Objective

The purpose was to gain insight in the experiences of older adults with a Dutch Online Community Care (OCC) platform and their motives to adopt or reject it.

### Methods

Users and non-users (N=17) of the OCC-platform were interviewed in focus groups. The Consolidated Framework for Implementation Research was used for interview guide development and directed content analysis.

### Results

All participants predominantly gave motives for rejecting the OCC-platform, which was seen as: 1) externally developed, not accessible or user friendly and its information content as outdated; 2) merely providing information one-sidedly and not as a two-way communication platform; 3) intended for other people than themselves. Participants came to the understanding that they did not actually chose the platform; they perceived it as being imposed upon them and, in hindsight, that it just had befallen them.

### Conclusion

The OCC-platform was largely rejected whilst it conformed to user(-interface) requirements. Working with end users in the development process does not guarantee that the product actually meets a felt need.

## Introduction

In the Netherlands, the aging of the population has led to healthcare reforms in which the state decentralized welfare and care functions from national to local governments. These local governments emphasize personal responsibility for one's own self, for the care of others and for the wellbeing of the community<sup>1-3</sup>. Older adults are consequently encouraged to live independently in their own homes for as long as possible, i.e. to age-in-place<sup>4</sup>.

Technology may support older adults in self-managing their care and aging-in-place. An example of such a technology is an *online community care platform (OCC-platform)* for community-dwelling older adults. An OCC-platform is a coherent combination of hardware and software components that are able to provide a base upon which applications can operate. These platforms look very much like, and operate similar to, the well-known 'smartphone'. Via OCC-platforms older adults can access a variety of applications that aim to support their independent living and participation on a community level. A few examples of these applications are presented in the text box below. Although little research has been performed on platforms as such, a lot is known regarding the impact of more common online communities for older adults which are known as 'social networking sites' (e.g. Facebook, Twitter). Prior research shows that the aforementioned have a positive impact for older adults on civic participation and that they can help to develop and maintain social relationships and to exchange social support<sup>5-8</sup>.

Numerous OCC-platforms were introduced in the Netherlands by various organisations and groups such as healthcare organisations, start-ups and citizen organisations. The current study specifically explores an OCC-platform that was developed in Heerlen, a city in the south of the Netherlands (Molenberg neighborhood, approximately 4400 inhabitants). During the development process older adults living in Molenberg were frequently asked to provide feedback on the platform's applications. Several other stakeholders, such as community workers, municipality agents and activity-based groups of older adults also provided feedback. This premeditated 'user-centered' improvement of the platform, an intensive process that took over a year, is in line with previous research which stresses the importance of including users to constitute online communities that will be functional, usable and accessible<sup>6,9</sup>.

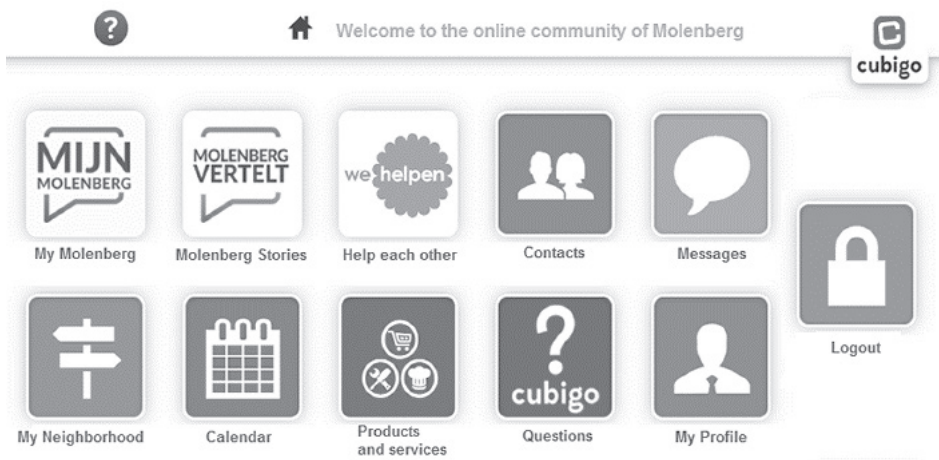
The resulting OCC-platform (Figure 4.1) was a private online community, free of charge. Individuals who chose to use the online platform had to create a personal account. The platform's applications were standardized; if a user comprehended one application, then he or she was able to use all applications. Whilst the primary target-

group were older adults, it was made accessible and available for all inhabitants. The purpose thereof was to create an online environment in which people of different ages were active, that is, to create an interdependent support system where the ‘old and young’ were facilitated to help each other. It was expected that the resulting OCC-platform met the needs and requirements of end-users.

#### Application examples

A few examples of OCC-platform are:

- a) a *matching tool for informal care* in which older adults can ask for, provide or be offered help,
- b) a *calendar*, in which older adults can access information on various local leisure time activities (LTAs) and,
- c) *messages*, by which older adults can communicate with each other by email.



**Figure 4.1** OCC-platform for the Molenberg community.

The resulting platform furthermore meets important user(-interface) requirements determined by previous research on online communities for older adults (e.g. a simple and minimalistic and community-driven)<sup>8,10,11</sup>. The OCC-platform also meets the requirements as defined by Boll and Brune<sup>12</sup>, who argue that an online community for older adults should combine elements of service-platforms and social networks. Online communities should at least have applications regarding: a) contacts, b) user-profile, c) (local) services and d) communication.

The implementation process of the OCC-platform was intensively supported by a community-manager who was frequently 'live and present' in the neighborhood to provide information, support and training to those who needed it (e.g. older adults with low digital skills). The community-manager was a funded independent contractor who, within the project, was commissioned to advance and improve the implementation of the platform. In mid-June 2016, the platform was officially launched and supported by several activities to enhance exposure and media coverage (e.g. by issuing a press release and advertising on social media). Remarkably, despite the efforts to implement a platform that both fulfilled user requirements and conformed to important prerequisites distinguished by previous research, it was barely used by older adults. The main research question of this study was therefore: *What are the experiences of older adults with an OCC-platform and what are their motives to reject or adopt it?*

## Methods

### Study design

This study had a qualitative design. To gain insight into the motives of older adults to adopt or reject the OCC-platform, three panels of older adults (users and non-users) were interviewed using focus groups. Qualitative methods can be useful for gaining a deeper understanding of motives and meanings. The collaborative nature of the focus group interviews furthermore provides the advantage of understanding group perceptions and opinions<sup>13,14</sup>.

### Participants

*Non-users* and *users* of the platform were recruited to gather data regarding the experiences of older adults with the OCC-platform and their reasons for accepting or rejecting it. Since digital skills are an important prerequisite for using the online platform, it was vital to include older users with and without digital skills. In total three panels of older adults were recruited in Molenberg:

- *Panel A: Digitally skilled users:* A panel that consisted of older adults who were digitally skilled and used the platform. The participants of this panel were invited via the OCC-platform to participate. Participants were suitable for inclusion if they were 65 or older and living at home.

- *Panel B: Digitally low-skilled users:* A panel that consisted of older users of the platform who had little or no digital skills. This panel consisted of a group of older adults who participated in a course about 'digital skills'. This course was established by the projects' community-manager and consequently affiliated with the OCC-platform.
- *Panel C: Non-users (mixture of skilled and low-skilled):* A panel that consisted of older adults who constituted the board of a local activity-based group in the community Molenberg. These older adults were intensively involved in the development and implementation process of the OCC-platform and thus aware of its existence. The panel members were registered on the OCC-platform (they had a profile set up) but indicated that they, despite their involvement in the development and implementation process, nonetheless chose not to actually use the platform.

The OCC-platform was web- based and applications for Android and IOS were available. As the platform operated in the same way irrespective of the device (e.g. Personal Computer, Tablet or Smartphone) via which the platform was consulted there was no difference in the use of the OCC platform.

## Setting

The OCC-platform was developed, implemented and made available for the Molenberg neighborhood. Molenberg is located in Heerlen; a city in the south of the Netherlands. Of the Molenberg population 27% is 65 years or older, 51% is single and lives alone and the majority (62%) rent their home. Furthermore, 79% of the inhabitants indicate that they feel a shared-responsibility for the welfare of the community and about half (52%) say they feel connected to Molenberg<sup>15</sup>.

## *Development of the OCC-platform*

ARESTOCO, a Belgian enterprise, provided the ICT framework. Their platform entitled "Cubigo" was selected because it was of an 'open source'; the software could be modified based on the wishes and needs of potential users<sup>16</sup>.

The goal of the underlying research project was to evaluate the impact of an OCC platform. The role of the researchers and the community manager was therefore to stimulate and facilitate the development and implementation of an OCC platform by the Molenberg community. To achieve this several actions were undertaken, such as the assembly of a workgroup (consisting of four men from Molenberg with an average

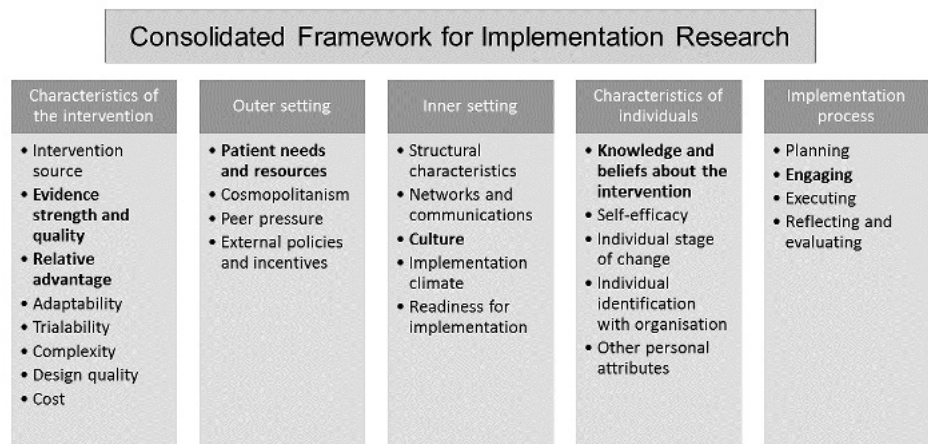
age of 40 years) that arranged four half-day sessions in which they determined the content of the platform (see Figure 4.1). The resulting OCC-platform was consequently reviewed in feedback-sessions with several stakeholders from Molenberg: the *board* of the local activity-based group from Molenberg (Panel C, N=4), older adults who took part in their activities (N=7), and local care professionals (N=4). After these sessions the final OCC-platform was developed with several visual adjustments and the addition of the application local services.

Panel C was thus involved in various ways in the implementation of the platform. Furthermore, the researchers and community manager regularly joined the meetings of 'panel C' where they met various stakeholders from Molenberg such as municipal representatives, youth consultants, and community social workers. During these meetings the progress of the development and implementation of the OCC platform was often discussed.

## Framework

The Consolidated Framework for Implementation Research (CFIR) was used to gather data regarding the experiences and motives of older adults. The CFIR is a comprehensive framework that can facilitate the identification and understanding of potentially relevant constructs in implementation studies. It can also be used to guide formative evaluations<sup>17</sup>. The CFIR (Figure 4.2) consists of five major domains: the intervention, outer and inner setting, the individuals involved and the process by which implementation is accomplished.

The five major domains contain 26 constructs in total. A selection of six CFIR constructs was used for the development of the focus group interview guide. As Damschroder<sup>17</sup> advises: "researchers can select constructs from the CFIR that are most relevant for their particular study setting and use these to guide assessments of implementation". We thought these six constructs were most suited since they were observed (whilst being present in Molenberg) as hindrance in using the OCC-platform (see Table 4.1). Two major domains of the CFIR were explored with panels A and B and all five domains were discussed with panel as they were involved in the development and implementation process of the OCC-platform.



**Figure 4.2** The consolidated framework for implementation research; constructs that were used to direct the interview guide are printed in bold.

The CFIR is primarily used for evaluating implementation in organizational settings. In the current study however, the focus lies on implementation in a *community* and on the *inhabitants* of that community. Therefore, in the CFIR we replaced ‘organization’ with ‘community’. Key stakeholders are in the current study older adults living in that community. Consequently, the inner setting is comprised of members of the Molenberg community and its representatives. All the participants of this study originate from the inner setting. The outer setting is comprised of ‘other stakeholders and organizations’ involved in the implementation of the OCC-platform, e.g. the local municipality or healthcare organisation.

## Data collection

Data was gathered using focus group interviews<sup>14</sup> which were comprised of a combination of questions and propositions. In total five focus groups were conducted: panel A and B were interviewed twice and panel C was interviewed once. The reason for performing two focus group interviews with panel A and B is that they, being users, could elaborate more on the use and usability of the platform. The focus group interviews of A and B were identical in terms of content and both consisted of open-ended questions. (e.g. regarding the experienced impact of the OCC-platform and regarding affective associations; which emotions correspond best with feelings towards the OCC-platform). Additionally, the use of the OCC-platform by panels A and B was



monitored and logged in user reports from February to October 2017. These reports contain the number of clicks (on the platform's applications) per participant.

**Table 4.1** Description of selected CFIR constructs

Construct	Construct description	Discussed with panel
<b>Characteristics of the intervention</b>		
Evidence strength and quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes	A, B, C
(Relative) advantage	Stakeholders' perception of advantages of implementing the intervention (versus an alternative solution)	A, B, C
<b>Outer setting</b>		
Patients' needs and resources	The extent to which patient needs (which in the current study are older adults), as well as barriers and facilitators to meet those needs are accurately known and prioritized	C
<b>Inner setting</b>		
Culture	Norms, values, and basic assumptions of given organisation	C
<b>Characteristics of individuals</b>		
Knowledge and beliefs about the intervention	Individuals' attitudes toward and value place on the intervention as well as familiarity with facts, thrust, and principles related to the intervention	A, B
<b>Implementation process</b>		
Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modelling, training, and other similar activities	C

The focus group interview with panel C primarily focused on the reasons for rejecting the OCC-platform and on the conditions the platform should have met to be successful. The 6 CFIR constructs were discussed by asking the respondents to discuss provocative propositions, such as: "I had insufficient information about the content of the OCC-platform" and "I had an active voice in the development and implementation of the OCC-platform". By discussing these propositions the respondents were challenged to be as straightforward as possible. These propositions were developed by the researchers based on the CFIR constructs and based on knowledge about early user experiences; during their frequent presence in the Molenberg community in the implementation process the researchers already identified several shortfalls.

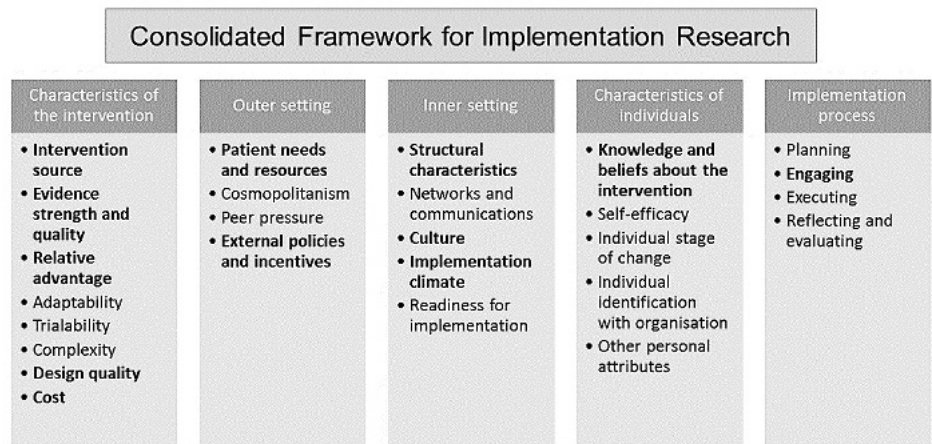
All focus group interviews were led by two interviewers; one was moderator and the other fulfilled the role of reviewer by double-checking answers and asking follow-up questions if necessary. All respondents completed informed consent forms. Prior to the focus group interviews, participants were presented with an informed consent form and were given affluent time to read it and, if necessary, to ask questions for clarification. Both the participant and a researcher signed the form. Finally, participants were de-identified during the process of transcribing.

# Data analysis

The data from the focus group interviews were analyzed using directed content analysis; an approach in which the coding process is guided by a theoretical framework<sup>18</sup>. The CFIR model was used as coding scheme: the researchers adopted the ‘NVivo Project Template: An NVivo project populated with CFIR codes and useful queries’ which is provided by the CFIR Research Team-Center for Clinical Management Research on [www.cfirguide.org](http://www.cfirguide.org). By adopting the total CFIR model as coding scheme, instead of only coding for the CFIR constructs that were included in the interview guide, the analysis yielded more than six constructs.

# Results

The directed analysis process resulted in 12 constructs within the five domains of the CFIR (Figure 4.3). The five major domains and the corresponding 12 constructs are presented according to the order of the CFIR structure. For each result is indicated from which panel it originates, from: A the digitally skilled users, B the digitally low-skilled users or, C the non-users.

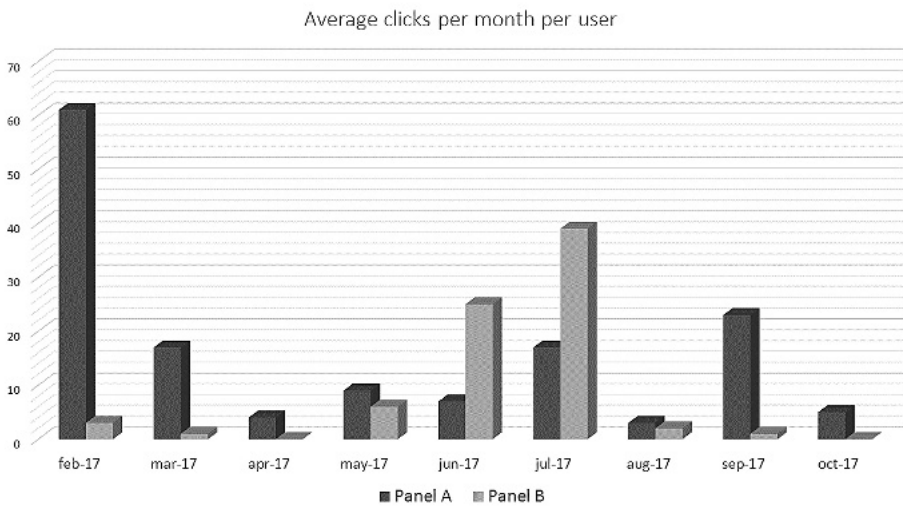


**Figure 4.3** The CFIR constructs that resulted from the directed analysis process are printed in bold.

# Participant characteristics

Panel A consisted of 1 woman and 3 men (N=4) with an average age of 69 years. The participants assessed themselves as digitally skilled and used the OCC-platform; they

performed on average 15 clicks per month within the OCC-platform (Figure 4.4). Panel B consisted of 7 women and 2 men (N=9) with an average age of 77 years. The majority of these participants indicated that they were digitally low-skilled. The users of this panel performed on average 8 clicks per month within the OCC-platform (Figure 4.4). Both panels A and B themselves indicated that they barely used the platform; they only accessed the platform a few times and often merely as a result of an email-notification that indicated new information was available. The panel of non-users consisted of 4 men (N=4) with an average age of 67 years.



**Figure 4.4** The average of clicks per month within the OCC-platform per user.

## Characteristics of the intervention

The first CFIR domain is related to the characteristics of the OCC-platform. The constructs that were mentioned by the user and non-user panels are described below.

### *Intervention source*

A participant of panel A described that he did not feel that the platform's software was chosen based on knowledge of internal properties, i.e. Molenberg characteristics: *"I had the feeling, that this (the standard software) was just an available and on the market software. We will just choose this, and give it to Molenberg: a standard product*

*which is not too expensive. [PA1]*” Every participant of the panel consequently confirmed this statement.

A panel C participant described a lack of ownership feelings: *“It (the platform) became something, next to us. It is not ours. I think those words are exactly right” [PC2]*. Another participant of the same panel illustrates how these feelings developed and how external parties tried to convince them of the platforms potential: *“You (implementation team) came at a time, that the reality of things made sure we could not work together all the time. Administrative issues and changes in our management ensured that our meetings could not go as planned. When we started collaborating, municipality-agents told us: you should not let this go, wait and see if it becomes something you can use (...) along the way we missed important parts. So it became something next to us instead of something of ours” [PC1]*.

The above-mentioned interview fragments suggest that the OCC-platform is regarded as an innovation that is 'externally developed'. Feelings of ownership are virtually non-existent.

### ***Evidence strength and quality***

Only participants of panel A felt that the presence, the mere existence of the OCC-platform, indicated that something was happening: *“Somewhat. The website shows that this neighborhood wants ‘something’. Because of this I ask myself the question: maybe I should do something too? And that’s why I think it does give a certain degree of feeling connected, even though these feelings are very weak” [PA2]*.

When asked if participants ever took part in local activities due to the platform they all indicated that this was not the case: *“Those activities (...) do not appeal to me. I mean, there are people that actually have a need for more people in their lives. I don’t. I already have my own network” [PA4]*. The participant thus indicates that his own network is sufficient and that he has no desire to expand it. Merely in incidental cases participants experienced a positive impact on making connections. A participant of panel B exemplifies: *“So I went through all the contacts of the Molenberg platform and I found my nephew. So of course, then, I immediately looked at his profile” [PB1]*.

Participants of panel C, the non-users, illustrate that they sometimes forget the platform altogether: *“With all due respect, I’ve said it before, it is not something I go looking for. It’s not in the picture. Sometimes I get a notification (via email), that wakes me up, and then I think Oh Yeah, I almost forgot it existed” [PC1]*.

These results demonstrate that the (non)user panels are not convinced of the OCC-platform’s added value, i.e. the participants have not experienced a positive impact on civic participation, feelings of connectedness or social cohesion.

### **Relative advantage**

Only panel C made a statement regarding the relative advantage of the OCC-platform and describe that they do not see one: *"I am so skilled on the internet that if I need information about a certain topic, I will search for it on Google. I don't need the platform to access information"* [PC1].

### **Design quality – logging in**

Participants of panel A all indicated that, although they had no trouble with the act of logging in, they found it unnecessary. All the more so as there was no privacy sensitive information on the platform: *"Why log in at all? There are no secrets on it (platform). Why would you ask users to log in? (...) Make sure everyone has free access. That is much easier. Logging in is an unnecessary barrier"* [PA2]. Panel C was asked to provide feedback on the notion of logging in as they were not users themselves. They also indicated that they perceived this prerequisite as an obstacle: *"You have to log in every time, and then try to find the information you are looking for. It would be easier if you could just search immediately (without logging in)"* [PC4].

### **Design quality – information content**

All panel A participations found the information content outdated:

*"It could have been something good if it had valuable content and if the information had been up-to-date (...) Content is merely a burden if you don't keep it up-to-date"* [PA3].

Participants of panel B also indicated that they found the information content outdated which caused them to be less interested in the platform: *"Because then I look and I think oh well, it (content) is still the same. And at the end of the week I'll look again and then there's nothing new still"* [PB2].

Panel C explained that the information content differed from their expectations: *"We assumed that the platform would be a portal where a person could request information regarding all kinds of needs. If, for example, a person wanted to know something about benefits, then they would be able to reach the social services via the platform"* [PC3].

### ***Design quality – applications***

A participant of panel A commented that the standardization of the platform's applications had no added value for him: *"I have nothing against standardization, but this is not (...) user-friendly. I want to arrive at the desired information fast. And standardization is nice, but only for one group, for the digitally low-skilled. Standardization is redundant for people who are skillful"* [PA2]. With this statement the participant puts forward that not all older adults are digital low-skilled and that for the skilled older adult a standardized platform can have a negative connotation.

### ***Design quality – alternative solutions***

During the interviews it gradually became clear that the OCC-platform did not meet certain design requirements. Consequently, users were asked the question: what kind of design would work? Both panels A and B suggested that it would be better to convert the platform into a regular website. A participant of panel A articulates: *"Why not erase the entire platform and instead make an ordinary and decent website? From and for Molenberg (...) and no logging in! I think that would be the best"* [PA4]. Participants of panel B correspondingly illustrate: *"The platform as it now is, has no privacy-sensitive information. Mainly things that occur in the neighborhood and information about local activities. So a normal website would be better"* [PA5].

### ***Costs***

The construct costs was raised by participants themselves. A participant expresses that in his opinion unnecessary costs were made: *"What annoys me I guess is.. well.. I am cost-conscious. And I think: this is expensive. Price and performance must be balanced (...) There is a lot of money going into this. A lot of wasted money"* [PA2]. Another participant illustrates that he understands that there are costs associated with the platform's upkeep.

And that is why, in the participant's opinion, the platform will cease to exist: *"Well, I'm aware that if you want to keep the information content up to date it (...) costs money and time (...) I'm afraid it (the platform) will inevitably cease to exist, given the expenses involved"* [PA3].

### ***Outer setting***

The CFIR domain 'outer setting' refer in the current study to *other* stakeholders (*than*: from the Molenberg community itself) involved in the implementation of the OCC-platform. Two constructs were found and are described below.

### **Needs and resources**

Participants of panel A suppose that older adults who are not digitally skilled will have problems in using the platform: *“Those people (digitally low-skilled) probably can’t log in or will at least have a lot of trouble with it (the platform)”* [PA2]. Correspondingly various participants of panel B indicate that they do not find the platform easy to use *“I didn’t find it easy (...) I’m a student, really (...) I listen and look at others to learn, copy them. I will get there eventually”* [PB7].

### **External policies and incentives**

This construct refers to external strategies to spread interventions, i.e. strategies and activities of organisations from the outer setting. Panel C came across various problems. External parties, for example, urge them to participate in all kinds of projects: *“We cannot do more than we already do. But apparently it is not enough. If someone of the municipality announced: we have a nice project for the community or something to do with citizen participation, then Wham!, a new project was imposed on us”* [PC1]. Participating in projects increasingly becomes an obligation in which Panel C feels they have no choice. They also illustrate that external parties suddenly wanted to undertake activities in the community and supplant tasks and responsibilities. They experienced ‘the OCC platform’ as a similar phenomenon and feel negatively affected by this: *“I see a divide.. Everyone wants to do something in this neighborhood. But not together (...) So yes, all of a sudden many people stand up. But they all want to do things for this community in their own way, under their own organisation or name. We used to be the only ones who did something”* [PC3].

### **Inner setting**

The third CFIR domain ‘inner setting’ is in the current study demarcated as the Molenberg community and its older adults (the participants of panels A, B and C all originate from the inner setting).

### **Structural characteristics**

The construct ‘structural characteristics’ refers to the social architecture, age, maturity, and size of the Molenberg community. The social architecture of ‘the context’ in which innovations (and therefore OCC-platforms) are implemented can have a major impact on the extent to which potential users identify themselves and thus adopt an innovation. In other words, an online community platform has to be a digital reflection of the community it represents. In the following section, participants describe the

architecture of the Molenberg community. It is divided into two parts: 1) a center, mostly inhabited by people with low incomes (alias: Old Molenberg) and 2) a border area, generally inhabited by people with high incomes.

Participants of panel A, who see themselves as people from the border area, literally distance themselves from the 'real' Molenberg, or as they call it: Old Molenberg. Two participants articulate the following: *"I don't 'really' live in Molenberg. Not officially. I am a borderlander (Laughs). I live in the better part of .. Heerlen". (...) "Me too. I also am a borderlander (Laughs)".* The conversation continues with an explanation why the Panel A participants do not belong to Old Molenberg: *"The borderlanders are not from the Molenberg, not really (...) To put it extremely: I come from the better part of Molenberg. And 'E' (from Old Molenberg) came to visit us sometimes. What E actually did was that he visited a upper class neighborhood as a kid from the working class, from Old Molenberg"* [PA4].

Participants of panel C see themselves as from Old Molenberg and want to represent the people living there. They illustrate how people from Old Molenberg feel ashamed of being from there: *"In general, especially people from Old Molenberg, we do not even dare to say we are from here. (...) The people of (Old) Molenberg are not a proud people. We should no longer talk about the fact that a police car was set on fire 25 years ago, or that we had the Vossekuil (a high-crime area) (...) We are now a calm neighborhood. We should be proud"* [PC1].

### **Culture**

The construct 'culture' is defined as the norms and values of the inner setting. Only participants of panel C elaborate on their culture and explain as wanting to work on a positive image for Old Molenberg and create a safe place for the people who live there: *"It is very important that we are the supercharger for people, that people feel that the can be proud of being from Molenberg (...) we should be, most of all, a place where older people, or vulnerable people can go to and say: Hey, I have a problem. And that we can accordingly refer them to a place to get the help they need"* [PC3].

### **Implementation climate**

The implementation climate has to do with tangible and immediate indicators of the community's commitment to its decision to implement the OCC-platform. The analysis process resulted in two sub-constructs 'compatibility' and 'goals and feedback' which are explained below.

The participants of panel A describe a lack of identification with the proclaimed target group of the platform: *"Those messages (sent via platform) are all about people that*



*are sick, and weak, and old. That is when I quit! (...) Those messages gave the impression that the platform was only intended for the sick, weak and old" [PA2].* The platform was thus perceived as intended for other people than themselves; it was not compatible with their own identity.

The panel B participants also described that the platform's emphasis on supporting its users to expand their social network felt redundant as they experienced their network to be sufficiently large. Moreover, most participants were hesitant of making online connections: *"And all of a sudden I see a person I know (on platform) and I think, I'm going to click on it! But no, I didn't. You don't actually know who it is, do you?" [PB8].* Furthermore, it seems as though participants were not aware of the fact that becoming a member of the OCC-platform meant that they were visible online for all other members: *"Those people (members of OCC-platform) can see me! They can all reach me, and they want to become my friend. I'm not happy about that! (...) I didn't really ask to be on there. I only registered. [PB7]"*

Only participants of panel C described how the goals of collaborating with the implementation team were not made clear to them: *"You (implementation team) never made clear what you, exactly, wanted from us, how many hours of labor? And that's necessary in a project such as this (...) If we know very precise what is expected of us, only then can we make an informed decision to participate or not" [PC1].*

## Characteristics of individuals

The fourth CFIR domain refers to the characteristics of the individuals involved in the implementation process. The corresponding construct: 'knowledge and beliefs about the intervention' is presented below.

The results indicate that the beliefs, or expectations, of the participants regarding the platform did not correspond with what they thought the platform was capable of. Participants of panel A illustrate: *"I think the platform is incomplete, but I did have high expectations. The content of the platform is not very straightforward, I don't know where to find what I am looking for. If that part is improved, the platform will be a lot better" [PA4].* Another participant of the same panel confirms: *"It unclear to me (the platform) I do not find the information I expected to find" [PA3].* A participant of panel B correspondingly expresses: *"I registered because I'm from Molenberg and because I wanted to know what is going on in the community (...) I expected to find information about that" [PB2].*

## Implementation process

The fifth and final CFIR domain concerns the implementation process. The corresponding construct ‘engaging’ has to do with attracting and involving appropriate individuals in the implementation. The participants of panel C were explicitly involved in the implementation process.

When asked if panel C felt like they were involved enough in the process they said: *“The things we were told sounded good. However, the final product turned out to be something else than expected. And in terms of having a voice: we didn’t feel like we had to say anything as we thought it (the development of the platform) was going in the right direction. So yes, we had a voice but did not have to use it (...) And gradually, partly because we didn’t invest much ourselves, the platform became something else than we wanted. If we had been on top of it ourselves, we would have intervened earlier”*[PC2]. In other words, the participants felt engaged but did not feel as if they needed to use their voice. They also indicated that they should have involved themselves more in order to be able to monitor the direction of the platforms development.

*Why do older adults use online community care platform, or not?*

Summarizing the current study’s results: only one motive was mentioned for accepting the platform, that is, the mere existence gives participants the feeling that something positive is happening in the community. However, all other results indicate motives for rejecting the platform. The major results regarding the latter are summarized per CFIR domain in Table 4.2.

**Table 4.2** Motives for older adults to reject the OCC-platform.

CFIR domain	Major result(s)
<b>Characteristics of the intervention</b>	<i>Intervention source:</i> The OCC-platform was regarded as an innovation that was 'externally developed'; feelings of ownership were virtually non-existent. <i>Evidence strength and quality:</i> No positive impact was experienced regarding civic participation, feelings of connectedness or social cohesion. <i>Design quality I:</i> The OCC-platform was not seen as accessible or user friendly and its information content as either outdated or as not matching expectations. <i>Design quality II:</i> The OCC-platform was seen as merely providing information (one-sidedly), i.e. as a website, and not as a two-way communication medium, i.e. as a platform that aimed to facilitate aging-in-place and social participation.
<b>Outer setting</b>	<i>External policies and incentives:</i> Participants (panel C) illustrate that other stakeholders tried to take over their tasks and responsibilities and that (working on the) implementation of the OCC-platform was not a choice.
<b>Inner setting</b>	<i>Structural characteristics:</i> Molenberg is a segregated community; it is inhabited by two groups of people which seem to be apart, even antagonistic, in terms of social architecture. <i>Compatibility I:</i> Participants with poor digital skills were apprehensive of making online connections or being visible online. <i>Compatibility II:</i> There was a lack of identification with the proclaimed target group and there was no perceived need for the 'things' the platform tried to improve; e.g. network expansion and community-participation
<b>Characteristics of individuals</b>	<i>Knowledge and beliefs about the intervention:</i> The beliefs, or expectations, of the participants regarding the platform did not correspond with what the platform was eventually capable of (e.g. providing relevant information on the community).
<b>Implementation process</b>	<i>Engaging:</i> Participants felt engaged in the implementation process, but did not engage themselves. They indicate that they were given every opportunity to participate but felt nonetheless no need or choice to be involved.

## Discussion

### Main findings

The current study explored the experiences and motives to reject or accept a Dutch OCC-platform based on focus group interviews with older users and non-users. The OCC-platform was barely used and largely rejected by the participants. Most participants were dissatisfied with the usability and information content of the platform. This finding is surprising since the platform filled the user(interface) requirements established by the intensive user-centered improvement of the platform and previous research<sup>6,8-11,19,20</sup>. Consequently we expected the platform to be usable, accessible and functional. The results however invalidate our expectations.

Our study confirms previous research outcomes that it is not easy to develop technologies which are effortlessly accepted and adopted by community-dwelling older adults even if end-users are involved<sup>9,20</sup>. The review of Nef et al.<sup>9</sup> illustrates that the

major barriers to adopt online communities for older adults are privacy issues and fear of inappropriate content. They furthermore describe that the purpose and benefits of online communities are often unclear and that this lack of obvious purpose and benefits might also explain why some do not adopt online communities. Furthermore, the review of Peek et al.<sup>20(p254)</sup> demonstrates that older adults have continued and legitimate concerns about privacy implications and stigmatization. Additionally, a substantial part of the participating older adults were unsure whether they actually needed technology themselves for aging in place “and that the perceived personal need of these community-dwelling older adults continues to play a role in their technology acceptance”.

The results of the current study show that in the end participants felt no need for the desired outcomes of the platform; such as network expansion or support for aging-in-place. Moreover, participants indicated no need to be involved more intensively in the implementation process. When asked to unequivocally reflect on the entire situation, participants came to the understanding that they did not *chose* the platform at all; they perceived it as being imposed upon them and, in hindsight, that it just had befallen them. When assessing the needs of the community (including the panel participants) in the beginning of the research project there appeared to be a need for the OCC-platform. Based upon this perceived need the choice was made to further develop and implement the platform in collaboration with key stakeholders. However, after the completed implementation process, community-dwelling older adults did not seem to feel a need after all. This illustrates that working with end users in the implementation and development process does not guarantee that the final product actually meets a felt need. This raises fundamental questions about how to co-create OCC-platforms and how to ensure that they are used.

Lastly, the results have demonstrated an segregated community; it is inhabited by two groups of people which seem to be apart, even antagonistic, in terms of social character. The researchers only discovered this ‘character’ during the evaluation of the OCC-platform. This finding testifies to the importance that an online community intervention should *truly* be an offline representation of the entire community it represents. An important prerequisite according to Marcelino<sup>8(p4)</sup> is that online social platforms for older adults are ‘community-driven’: “it is profitable to follow and interact with people who have similar background with regards to interpersonal growth”. In other words, there only really is a community when the identity of its members is equal in some way. In the current study however, the ‘community’ was considered as such only because of a geographical demarcation and the assumption was made that when people originate from the same area that they automatically have ‘similar backgrounds’.

## Strengths and limitations

The strength of this study lies in its distinct foundation within the Consolidated Framework for Implementation Research. As Peek et al.<sup>20</sup> demonstrate little research has been done on the factors influencing acceptance of technology within existing frameworks or models. In their review, for example, 14 out of the 16 included articles did not use an existing technology acceptance framework or other models. Another strength lies in the fact that our study intensively focuses on the *post-implementation* stage. Few studies report on understanding what drives (dis)continued use of technology once it has been implemented; most focus on the pre-implementation stage<sup>20</sup>.

This study also has several limitations. Since the aim of the current study was ultimately to set up an intergenerational OCC-platform, these findings may be limited by the fact that that young people were insufficiently involved in the development, implementation and evaluation of the platform. Furthermore, the study might have been improved if we had appointed a control group (a fourth panel) of non-users who were not involved in development process of the OCC-platform.

Another limitation of this study is that panel C differs from the other panels because of their role in the development and implementation of the platform. It is thus important to bear in mind the possible bias in their responses; they provided feedback on the platform from a different perspective and with prior knowledge. Moreover, during the focus group interview it became clear that panel C experienced feelings of being over-used. This may ultimately have been the reason why they did not use the platform; they perhaps experienced adopting the OCC-platform as yet another role that they had to play as 'active citizens'.

Furthermore, the results should also be interpreted with caution due to several issues regarding the participants characteristics. First, the results may be limited by the modest sample size, i.e. the mere focus on one Dutch neighborhood. Moreover, although the sample size is small, the results seem to indicate that there are differences in socio-demographic characteristics that may have influenced the outcomes.

Lastly, the role of the researchers could also have influenced the findings. The researchers were involved in the development and implementation of the OCC platform in various ways and had an interest in evaluating its impact. They mainly had a 'directing' role; they ensured that inhabitants gathered to think about the content of the platform and facilitated them in its development. They also had an important role in the implementation of the platform, i.e. the promotion and publicity surrounding its availability. This involvement may have influenced the results. For example, the

researchers were quite positive about the potential of the OCC platform in supporting older adults from Molenberg. Inhabitants perhaps had a too positive perception and expectation of the OCC- platform because of this.

## Research and practical implications

We have observed that research is scarce on failures and typically focuses on innovations that have positive effects and fare well. Too often we overlook potentially promising technologies and innovations for the aging because we learn inadequately from failures. Knowledge regarding the latter can aid other projects in preventing adverse mechanisms and help them to learn from mistakes made by others<sup>21,22</sup>.

As described, the OCC-platform was implemented upon the assumption that it would have added value for the aging-in-place from Molenberg. We deduce that a general need assessment and simply involving end-users is insufficient. When future implementation teams consider to implement online communities we recommend that they perform a comprehensive holistic study on the inner setting of a given community and that they execute elaborate in-depth interviews with participants from all layers of a given population. The purpose thereof is to ensure that *online* communities better represent the complex *offline* reality of a neighborhood. A way of better grasping the true needs of community-dwelling older adults is by administering more creative methods in development processes and data-collection. In this case we can learn from other disciplines, such as (creative) product designers who use many 'out-of-the-box' methods to include users in the development of innovating technologies. Examples are 'Co-creation' and 'Design Thinking'<sup>23</sup>. Design Thinking is a method to identify and solve problems in which potential users are always the starting point; problems are operationalized based on human needs. Consequently, Design-Thinking is also known as Human-Centred Innovation. In the (health)care domain this means that the patient or older adults is the first to be extensively consulted before 'solutions' are even explored. Co-creation is a method to work with stakeholders from a (complex) issue to an innovative solution. Design Thinking is a way to shape co-creation<sup>24</sup>.

Finally, it is important to bear in mind that older adults do not necessarily *want* to use online tools such as OCC-platforms, even if they are able to. Non-use is an active, motivated and considered enterprise; older adults consciously *choose* not to use certain technologies for many reasons. For example, some older adults "consciously avoid 'getting caught up in' digital life, viewing the abundance of applications and features as potential diversions from more rewarding (social, real-life) activities"<sup>25(p74)</sup>. Furthermore, some older adults distrust technologies because they feel that they are not skilled enough to adequately use them and are afraid to make mistakes. Lastly, as

Knowles & Hanson<sup>25</sup> adequately describe, we must not forget that older adults' lives are still extremely busy, with clubs, activities and commitments to family and friends. They simply do not have time to learn how to use online services well enough to use them with confidence.

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5



# Chapter 5

Perceived impact of an online community care platform  
for Dutch older adults on local participation,  
informal caregiving, and feelings of connectedness:  
pretest-posttest observational study

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*J Med Internet Res 2020;22(12):e20304*

## Abstract

### Background

In a changing ageing society wherein older adults are increasingly expected to take care of themselves instead of relying on health care services, online community care platforms can help older adults to meet these expectations. A considerable number of these online community care platforms have been introduced in several European countries based on their potential. However, their actual impact is unclear.

### Objective

The aim of this study was to investigate the self-reported use, expectations, and perceived impact of a Dutch online community care platform called Grubbenvorst-Online among Dutch older adults. The following 2 questions were studied: (1) What is the self-reported use of Grubbenvorst-Online among older adults? (2) What are their expectations and perceived impact of Grubbenvorst-Online regarding local participation, their social network, mutual informal caregiving, and feelings of connectedness?

### Methods

An observational pretest-posttest study was conducted. Participants were recruited via a web-based message on the Grubbenvorst-Online platform and data were collected via postal questionnaires among older users at the start of the study and 4 months later. Data regarding the expectations and the perceived impact of Grubbenvorst-Online were compared and tested.

### Results

Forty-seven Grubbenvorst-Online users with an average age of 74 years participated in this study. They were healthy, predominantly “internet-skilled,” and they found the internet important for maintaining social contacts. In general, the use of the online community care platform decreased during the 4-month follow-up period. The perceived impact of Grubbenvorst-Online was significantly lower than that expected regarding information provision ( $P=.003$ ), seeking help from fellow villagers ( $P<.001$ ), giving help to fellow villagers ( $P<.001$ ), and consulting care or welfare services ( $P<.001$ ).

### Conclusions

The findings of this study indicate that online community care platforms perhaps do not provide enough “added value” in their current form. We suggest a new direction in which online community care platforms primarily support existing offline initiatives aimed at stimulating local participation, informal caregiving, and feelings of connectedness.

## Introduction

In a changing ageing society wherein older adults are increasingly expected to take care of themselves instead of relying on health care services<sup>1,2</sup>, online community care platforms can help older adults to meet these expectations. A considerable number of web-based platforms for older adults has been introduced in several European countries, for example, Germany<sup>3</sup>, the United Kingdom<sup>4</sup>, Belgium, and the Netherlands<sup>5-8</sup>. All these platforms target older adults and their care networks to facilitate and support aging-in-place.

In our scoping review, a typology of online care platforms for community-dwelling older adults was developed. This review was performed because little research had been conducted on the availability of web-based platforms for older adults and their characteristics, functionalities, and usability in order to guide older adults in choosing a suitable platform. The review resulted in an overview of 21 care platforms, which can be classified into the following 3 types: (1) *Online Community Care Platforms*, which attempt to enhance social cohesion by interlinking community-dwelling older adults with neighboring informal caregivers and by promoting local activities at the neighborhood level; (2) *Online Care Network Platforms*, which provide older adults and professional and informal caregivers tools to coordinate, plan, and communicate about (health) care; and (3) *System Integrator Platforms*, which interconnect a variety of functionalities. The latter platform type has the capability of integrating existing services and apps into its own software, that is, it operates as an “empty” information communication technology framework, which can be filled with any content<sup>9</sup>. This study focuses on a *System Integrator Platform* that was deployed as an online community care platform. In other words, all functionalities in this information communication technology framework were aimed at enhancing social cohesion or at promoting local activities at the neighborhood level. Thus, we choose to use the term “online community care platform” when referring to the platform in this study.

Online community care platforms offer older adults various apps aimed at supporting their independent living (eg, products and services) and civic and social participation (eg, contacts, messages, a matching tool for informal care). Studies have shown that more common web-based communities for older adults, which are known under different names such as “social networking sites” (eg, Facebook, Twitter, LinkedIn), “online social networks,” or “online social communities” can potentially have a positive impact on civic participation and help to develop and maintain social relationships and social support<sup>10-13</sup>.

It seems that online community care platforms are implemented in several European countries based on the assumption that they can support older adults to age-in-place, to participate locally, and that they can help to develop and maintain social relationships and to arrange social support. As governments call for increased autonomy at local levels<sup>1</sup>, these platforms seem perfectly suited tools for older adults to actually remain or even become more autonomous. However, their actual (perceived) impact is unclear [9]. The majority of previous research has focused on the usability and acceptability of these web-based communities or platforms and thus on the preimplementation phase. Hardly any studies report the factors that contribute to the continued use or to the desertion of web-based communities once they have been implemented<sup>14</sup>. It is important for both users and policy makers to discover to what extent these platforms actually help older adults to participate locally and socially.

This study therefore primarily focusses on the perceived impact in the postimplementation phase of an online community care platform that was implemented in 2015, called as “Grubbenvorst-Online” (abbreviated as GO, Grubbenvorst refers to the town in which the platform was implemented). Grubbenvorst-Online was the initiative of an active group of local older citizens (“the initiators”) who, through the platform, aimed to help both older adults and vulnerable inhabitants of Grubbenvorst to socially participate locally. Grubbenvorst Online was founded by the initiators in close collaboration with local entrepreneurs, associations, and social and health care organizations. Arestoco, a Belgian enterprise, provided the information communication technology framework for the Grubbenvorst-Online platform. Their platform entitled “Cubigo” was selected, as its software could be modified based on the wishes and needs of potential users<sup>15</sup>. The content of Grubbenvorst-Online (Figure 5.1) was determined and kept up-to-date by the initiators.

A few examples of the platform’s apps are (1) a matching tool for informal care, called as “Help each other,” in which users can exchange informal help (Figure 5.2), (2) a local calendar where information can be found on local events and activities (Figure 5.3), and (c) social services in which users can find information about available care services and organizations.

The following 2 questions were studied.

1. What is the self-reported use of Grubbenvorst-Online among older adults?
2. What are the expectations and perceived impact of Grubbenvorst-Online among older adults regarding local participation, their social network, mutual informal caregiving, and feelings of connectedness?

We wanted to determine what users expected from Grubbenvorst-Online when they started using it, what did they think the platform was intended for and had to offer in general, and then to investigate to what extent the platform met these expectations



**Figure 5.1** Screenshot of the online community care platform Grubbenvorst-Online.

## Methods

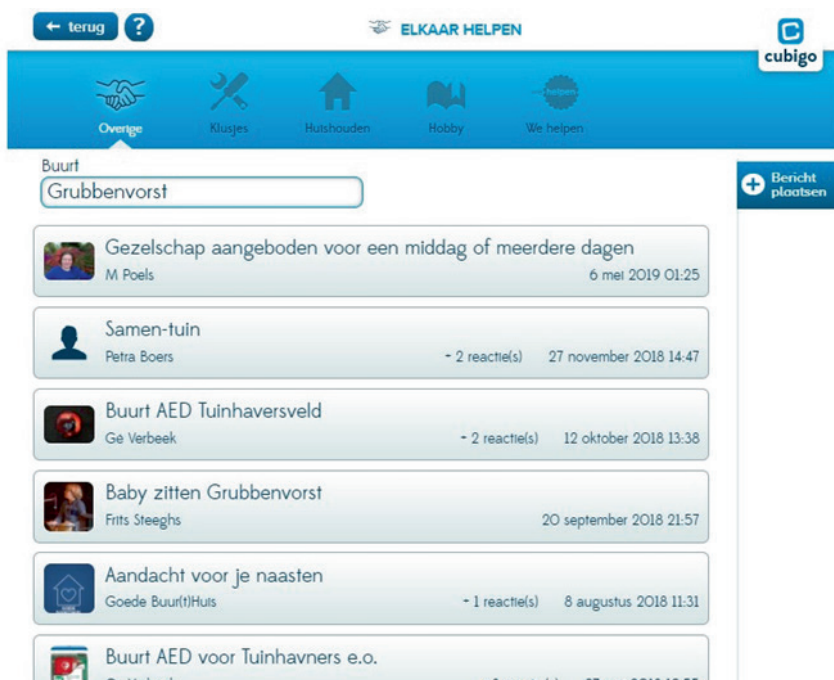
### Design

This study had an observational pretest-posttest design. Data on the use, expectations, and perceived impact regarding the online community care platform Grubbenvorst-Online was collected via 2 postal questionnaires completed by older users. Our aim was to perform an exploratory study among approximately 50 participants.

### Setting

Grubbenvorst is a sparsely populated village in Limburg, which is the southernmost province of the Netherlands. Approximately 1200 of the 4800 inhabitants (25.0%) are 65 years or older<sup>16</sup>. Grubbenvorst-Online was made available for all inhabitants of

Grubbenvorst in August 2015. Several activities were undertaken to communicate and promote the existence and availability of the platform, such as (1) public launch of Grubbenvorst-Online in the central square in Grubbenvorst in the presence of the alderman; (2) publication of advertisements in “Announcements” (a local newspaper); (3) distribution of flyers, brochures, and other public relations material; (4) placement of a large billboard at the main entrance of the village; (5) various informative presentations for organizations such as associations for older adults, care organizations, and an elementary school; and (6) taking part in a TV interview at the local broadcaster (TV Reindonk). At the start of the study in early 2018, Grubbenvorst-Online had approximately 725 users.



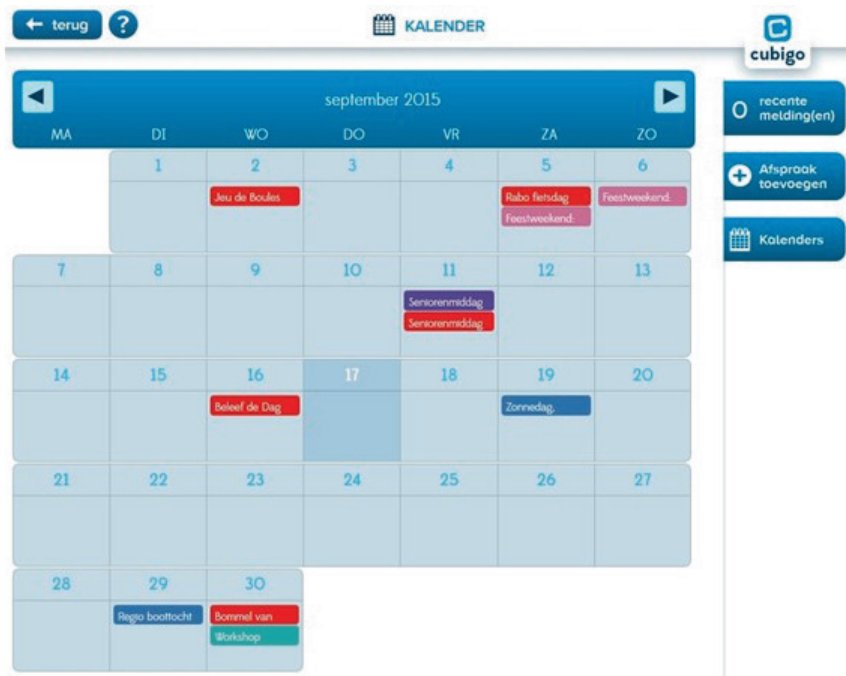
**Figure 5.2** Screenshot of the functionality "Help each other".

## Participants

Participants were recruited among the users in January 2018 via a web-based message on the Grubbenvorst-Online platform. This message described the purpose of the study, that is, to gather information regarding the way in which older adults used the platform and how they perceived its impact. Older adults were asked, if interested, to



register within 1 month by leaving their contact details with the initiators. Applicants were suitable for inclusion if they were 65 years or older and if they were a user of the online community care platform. This means that every potential participant was an existing user, had already registered on the online community care platform, and was therefore more or less familiar with the functionalities and operation of the platform. Furthermore, the length of time that the participants used the platform was *not* an inclusion criterion; hence, both “old” and “new” users were suitable for inclusion. Recruitment stopped by the time 51 participants had registered.



**Figure 5.3** Screenshot of the functionality "Calendar".

### Statement of ethical approval

The ethical principles that are outlined in the Dutch “Medical Research Involving Human Subjects Act” were followed throughout the entire study. The ethical approval for this study was given by METC-Z (16-N-213).

## Data Collection

Two postal questionnaires were used to collect reports of older adults regarding the use, expectations, and perceived impact of the Grubbenvorst-Online platform. Potential participants received an invitation letter, informed consent form, and the first (baseline) postal questionnaire (T0) in March 2018. Four months later, in July 2018, they received the second postal questionnaire (T1). Table 5.1 illustrates the themes and topics of the questionnaire and their operationalization. The baseline questionnaire (T0) was primarily designed to collect information on the *expectations* of older adults regarding the online community care platform: did participants expect the platform to have positive effects on local participation, informal caregiving, their social network, and feelings of connectedness? The follow-up questionnaire (T1) aimed to discover to what extent the expectations as formulated in T0 were met (i.e., perceived impact). As there were no validated scales available to measure the expectations and perceived impact of online community care platforms, the scale was developed by us.

General characteristics of the participants were collected as well as details of their use of the internet and technology and use of informal care and their community involvement and related needs. Regarding the aforementioned characteristics, validated scales or parts of existing questionnaires were used. For topics 2-4 (Table 5.1), parts of the validated questionnaire “Senior Monitor Heerlen”<sup>17</sup> were used, that is, “Civic participation and social network” and “Living and environment.” Additionally, for topic 4, the validated scale “Involvement with neighbors”<sup>18</sup> was adopted. This scale incorporates 3 domains of social cohesion: (1) collaboration to stimulate local well-being; (2) solidarity: the extent to which neighbors help each other, and (3) feelings of connectedness: the extent to which neighbors feel connected to each other.

Concerning the topic of informal care, participants could answer yes or no to whether they gave help, whether they were willing to give help, whether they already received help, and finally, whether they would accept help from someone living in their close vicinity. If participants indicated that they helped someone, they did not have to answer the question whether they were prepared to offer help. The topic was introduced as follows: “the following questions are about your ability to help others or to receive help yourself. This “help” can, for example, consist of doing chores around the house or doing groceries together with family, friends, neighbors, or acquaintances. Thus, the questions were not related to physical care tasks.

**Table 5.1** Questionnaire themes and their operationalization.

Theme	T0/T1	Items (n)	Topics	Adopted propositions and questions
<b>Participant characteristics</b>	T0	27	(1) General characteristics (eg, gender, date of birth), (2) Use of internet and technology, (3) Informal care, (4) Community involvement and related needs	Examples of questions for topics 2-4: (2) How important is the internet for you to keep in touch with other people? (nominal 5-point scale from “very important” to “unimportant”), (3) Would you accept help from a neighbor? (Yes/No), (4) Do you feel involved with the people living in your immediate vicinity? (nominal 5-point scale: “With almost none,” “With most not,” “With some,” “With most,” “With almost everyone”).
<b>Self-reported use of Grubbenvorst-Online</b>	T0-T1	14-17 <sup>b</sup>	Use of platform in general and of specific functionalities <sup>c</sup>	Examples of questions (nominal 4-point scale: “Never,” “Occasionally,” “Regularly,” and “Daily”): (1) How often do you currently use the GrubbenvorstOnline platform? (T0 + T1); (2) How often do you currently use the “Grubbenvorst Village Calendar”? (T0+T1); (3) Have you used Grubbenvorst-Online less, more often, or to the same extent compared to 4 months ago? (T1)
<b>Expectations of Grubbenvorst-Online</b>	T0	7	Expectations regarding the platform’s added value regarding local participation, informal caregiving, social networking, and feelings of connectedness	Examples of propositions (3-point scale: “[Strongly] Agree,” “Neither agree nor disagree,” “[Strongly] Disagree”): (1) I expect I will partake more in village activities because of Grubbenvorst-Online, (2) I expect that I will use Grubbenvorst-Online to ask my fellow villagers for help (e.g., with a job around the house or grocery shopping)
<b>Perceived impact of Grubbenvorst-Online</b>	T1	7	Perceived impact of the platform regarding local participation, informal caregiving, social network, and feelings of connectedness	Examples of propositions (3-point scale: “[Strongly] Agree,” “Neither agree nor disagree,” “[Strongly] Disagree”): (1) Because of Grubbenvorst-Online, I partake more often in village activities. (2) I asked for the help of a fellow villagers via Grubbenvorst Online (e.g., for a job in the house or grocery shopping)

a T0: baseline questionnaire, T1: questionnaire after 4 months of the study. b Apart from a few additional questions in T1 (such as example 3), the questions were identical in T0 and T1. c Not all functionalities of Grubbenvorst-Online (see Figure 5.1) were assessed. Only functionalities identified by the initiators as most important were included in the questionnaire.

## Data analysis

The baseline characteristics of the participants who filled out both questionnaires (T0 and T1) were expressed in mean (SD) or n (% of the participants). The comparison of

the expectations and perceived impact of Grubbenvorst-Online was tested with the McNemar test. All *P* values were two-sided and were considered to be statistically significant if less than .05. SPSS 25 (IBM SPSS Statistics for Windows, IBM Corp) was used for data entry and statistical analysis.

## Results

### Participant characteristics

Of the 51 initial participants, 47 were included in the data analysis as they filled out both questionnaires (T0 and T1). This group consisted of 25 men and 22 women with a mean (SD) age of 74 (6.2) years. All participants were of Dutch nationality and had a relatively high level of education: 18 out of 47 (38%) had a university degree or a higher professional education qualification and 19 participants (40%) had a secondary vocational education qualification. The majority of the participants (32/47, 68%) lived with a partner, either married or unmarried. The average grade that participants gave for their own health was 7.6 (range 0-10, higher scores indicating better health). Only 14 participants (30%) indicated that they felt slightly hindered in their daily activities due to a long-term illness or disability.

### Use of Technology and Internet

All 47 participants were asked to indicate the extent to which they adopted certain devices. A smartphone was used “regularly” by 11 participants (23%) and “daily” by 18 participants (38%). An iPad or tablet was used “regularly” or “daily” by 26 participants (55%), and a laptop was used “daily” by 26 participants (55%). All participants indicated that they used the internet. Furthermore, 31 out of the 47 participants (66%) considered its use to be “(very) easy,” 12 (25%) participants found the easiness of internet use as neutral, and only 4 participants (9%) found the use of internet “difficult.” In addition, 30 participants (65%) considered the internet to be “(very) important for keeping in touch with others.”

### Informal care

Out of the 47 participants, 13 (28%) indicated that they helped someone living in their immediate vicinity. A considerably larger proportion (31/47) was prepared to offer help and the majority (43/47) was willing to accept help. However, 39 (83%) participants

indicated that they did not need any help from people living in their immediate vicinity (see Table 5.2).

## Community involvement and related needs

The extent to which participants felt connected to people in their immediate vicinity was high; 20 out of 47 participants (43%) felt connected with most people and 13 participants (28%) with almost everyone. Only 5 participants (11%) indicated a need for more contact with people from their immediate vicinity. The vast majority, that is, 33 out of 47 participants (70%) specified that they felt no need for more contacts as they were satisfied with the number of contacts they already had. These results show that, in general, the participants already had a relatively large social network and felt no need to expand it further.

**Table 5.2** Participants' views on informal care (n=47).

Variables	Value
<b>Gave help to someone, n (%)</b>	
Yes	13 (28)
No	33 (70)
Missing (no answer)	1 (2)
<b>Prepared to offer help, n (%)</b>	
Yes	31 (66)
No	6 (13)
Missing (no answer)	10 (21)
<b>Willing to accept help, n (%)</b>	
Yes	43 (92)
No	3 (6)
Missing (no answer)	1 (2)
<b>Need help, n (%)</b>	
Yes	7 (15)
No	39 (83)
Missing (no answer)	1 (2)

## Use of the Grubbenvorst-Online Community Care Platform

The mean (SD) score (range 0-10, higher scores indicating greater valuation) that the participants gave to the online community care platform as a whole was 7.3 (1.0) at T0 and 7.1 (1.3) at T1. Table 5.3 gives an overview of the use of the Grubbenvorst-Online platform as a whole (see row and per functionality at baseline, T0, and at follow-up, T1). The functionalities "Grubbenvorst-Online," "Columns and interviews," "Photo and Video," and "Messages" were the most frequently used at both T0 and T1. However, only a minority of the participants indicated that they used the aforementioned

functionalities on a regular or daily basis. The functionalities “Dialect Dictionary,” “Social Services,” “Local entrepreneurs,” “Local associations,” “Health care services,” and “Contacts” were the least used.

**Table 5.3** Self-reported use of the online community care platform Grubbenvorst-Online as a whole and per functionality (n=47).

Online community care platform/functionality		Regularly	Daily
Grubbenvorst-Online (platform), n (%)	T0 <sup>a</sup>	17 (36)	4 (9)
	T1 <sup>b</sup>	11 (23)	3 (6)
Grubbenvorst-Online (functionality), n (%)	T0	14 (30)	1 (2)
	T1	12 (26)	2 (4)
Columns and interviews, n (%)	T0	12 (26)	0 (0)
	T1	7 (15)	0 (0)
Calendar Grubbenvorst, n (%)	T0	8 (17)	0 (0)
	T1	8 (17)	0 (0)
Photo and Video, n (%)	T0	11 (23)	0 (0)
	T1	11 (23)	0 (0)
Dialect Dictionary, n (%)	T0	3 (6)	0 (0)
	T1	2 (4)	0 (0)
Social Services, n (%)	T0	2 (4)	0 (0)
	T1	2 (4)	0 (0)
Local entrepreneurs, n (%)	T0	2 (4)	0 (0)
	T1	0 (0)	0 (0)
Local associations, n (%)	T0	4 (9)	0 (0)
	T1	4 (9)	0 (0)
Health care services, n (%)	T0	4 (9)	0 (0)
	T1	2 (4)	0 (0)
Contacts, n (%)	T0	6 (13)	0 (0)
	T1	2 (4)	0 (0)
Messages, n (%)	T0	15 (33)	2 (4)
	T1	12 (26)	0 (0)
Help each other, n (%)	T0	6 (13)	0 (0)
	T1	6 (13)	0 (0)

<sup>a</sup>T0: baseline questionnaire. <sup>b</sup>T1: questionnaire after 4 months of the study.

In general, a minor decrease was reported in the use at the level of specific functionalities: at T1, the “regular” use of functionalities decreased or remained stable while the “daily” use of functionalities did not occur (with the exception of 2 participants who consulted the Grubbenvorst-Online feature).

## Impact of the Grubbenvorst-Online Platform: Expectations and Experiences

Table 5.4 shows the number of participants who (fully) agreed at T0 with propositions about various potential effects of their use of Grubbenvorst-Online; in other words, these correspond to the participants’ expectations of the platform. Table 5.4 also

shows the number of participants who (fully) agreed with the same propositions about Grubbenvorst-Online at T1: this is the participants' perception of the impact of the platform after having used it. In general, the participants' expectations of Grubbenvorst-Online were not fully met. At T1, the participants' overall perceived impact of Grubbenvorst-Online was significantly lower than they had expected with respect to "information provision about Grubbenvorst" ( $P=.003$ ), "seeking help from fellow villagers" ( $P<.001$ ), "giving help to fellow villagers" ( $P<.001$ ), and "consulting care or welfare services" ( $P<.001$ ). Their expectations of Grubbenvorst-Online and its perceived impact differed least regarding "participating in local activities," "feeling connected to Grubbenvorst," and "expansion of social network." Overall, participants perceived the highest impact of Grubbenvorst-Online regarding "information provision about Grubbenvorst," "feeling connected to Grubbenvorst," and "participating in local activities."

**Table 5.4** Expectations of Grubbenvorst-Online (T0) and the perceived impact of Grubbenvorst-Online (T1) regarding various indicators.

Variables	Value (n=47)	P value
<b>Information provision about Grubbenvorst, n (%)<sup>a</sup></b>		<b>.003<sup>b</sup></b>
Expectation	36 (77)	
Perceived impact	24 (51)	
<b>Participating in local activities, n (%)</b>		<b>.23</b>
Expectation	14 (30)	
Perceived impact	9 (19)	
<b>Feeling connected to Grubbenvorst, n (%)</b>		<b>.18</b>
Expectation	19 (40)	
Perceived impact	14 (30)	
<b>Expansion of social network, n (%)</b>		<b>.11</b>
Expectation	13 (28)	
Perceived impact	6 (13)	
<b>Seeking help from fellow villagers, n (%)</b>		<b>&lt;.001<sup>b</sup></b>
Expectation	17 (36)	
Perceived impact	2 (4)	
<b>Giving help to fellow villagers, n (%)</b>		<b>&lt;.001<sup>b</sup></b>
Expectation	17 (36)	
Perceived impact	3 (6)	
<b>Consulting care or welfare services, n (%)</b>		<b>&lt;.001<sup>b</sup></b>
Expectation	22 (47)	
Perceived impact	1 (2)	

<sup>a</sup> Strongly agree with proposition. <sup>b</sup> This value was significant at  $P<.05$  in the McNemar test (two-sided).

## Discussion

### Major Findings

We explored the self-reported use, expectations, and perceived impact among older adults of a Dutch online community care platform. The study involved 47 healthy and predominantly “internet-skilled” older users (average age, 74 years). The vast majority of these users indicated that they were willing to help people living in their immediate vicinity; however, they did not necessarily feel a “help need” themselves. Furthermore, only a small proportion indicated a need for more social contact. The online community care platform was graded by the participants with an overall “more than sufficient” grade of 7.2. In general, the use of the online community care platform decreased during the 4-month follow-up period. The functionalities “Grubbenvorst-Online,” “Messages,” “Photo and Video,” and “Columns and interviews” were the most frequently used. At follow-up, participants’ perceived impact of Grubbenvorst-Online was significantly lower than their initial expectations of the impact the platform would provide regarding “information provision about Grubbenvorst,” “seeking help from fellow villagers,” “giving help to fellow villagers,” and “consulting care or welfare services.”

When the participants’ perceived impact of Grubbenvorst-Online is viewed in isolation (ie, without comparing it to their expectations), it can be ascertained that participants perceived the highest impact with respect to “information provision about Grubbenvorst,” “feeling connected to Grubbenvorst,” and “participating in local activities.” This indicates that an online community care platform can play a role in stimulating positive feelings toward communities and encouraging its members to undertake activities locally.

It is noteworthy that participants perceived little-to-no impact regarding (mutual) informal caregiving (i.e., asking for or giving help to fellow villagers), although there was a high degree of willingness on the part of these participants to care for or accept help from people living in their vicinity. However, the participating older adults did indicate that they felt no need to expand their networks and did not express any great need for care from people living in their vicinity. Therefore, perhaps this limited perceived impact regarding (mutual) informal caregiving is related to the limited need for support or network expansion. This finding is remarkable as these web-based communities or platforms aim to support (and stimulate) older adults to exchange various forms of social support as it is increasingly expected that they must rely on their social network. This finding implies that online community care platforms are not suited for every older adult as such platforms have goals that not every older adult will



share; not all older adults need web-based support or require help to find offline support or to request the assistance of others.

Based on our findings, we can conclude that older adults who are still healthy, self-reliant, and internet-skilled seem to be able to find their own means of solving problems and arranging informal care. This is not new because if governments or other organizations that bear responsibility for the welfare of citizens fail to provide people with a sense of security (eg, when state provision is reduced and as a result, older adults are increasingly expected to take care of themselves instead of relying on health care services), people will feel compelled to organize this security themselves. In this scenario, they will look for and find solidarity in small-scale physical groups<sup>19</sup>. It may therefore not be desirable at all to “formally” stimulate or organize local participation or mutual informal care; perhaps, platforms should merely try to provide another means by which citizens themselves can organize local participation and informal care.

## Strengths and limitations of this study

The strength of this study is that it contributes to knowledge about the (perceived) impact of a web-based community and about its actual use after the implementation. However, we did not intend to demonstrate actual causality between the functionalities of the web-based platform and their intended outcomes (eg, an increase in local participation or feelings of local connectedness) but instead aimed to illustrate how older users perceive the use and impact of an online community care platform. Furthermore, the results should be interpreted with some caution considering the modest sample size and the possible “biased sample:” participants were mainly healthy, highly educated, and internet-skilled. Since the primary target groups of the platform were older adults and vulnerable inhabitants of Grubbenvorst, we did not include the target group of the platform in its entirety, as vulnerable people were not included in the sample. Moreover, as the purpose of this study was to understand the expectations and perceived impact of a relatively small group of users regarding a web-based platform, it might have been of added value to additionally adopt qualitative methods to answer our research questions.

Additionally, it is possible that the “first-come-first-served principle” as adopted in the recruitment process resulted in a biased sample in which users who used Grubbenvorst-Online more than others registered to participate in the study. Perhaps, because of this, the depiction we now have of the use of Grubbenvorst-Online is more positive than actually is the case. Furthermore, the strength of our study would have been improved if we had asked participants the length of time they had been using Grubbenvorst-Online since expectations of new users would possibly be different from

the expectations of a long-term user. Finally, in the questionnaire, we did not ask the types of help participants were willing to offer or accept. Thus, we cannot be certain whether older adults do not need support or informal care or whether they have simply already arranged it themselves without the help of a web-based platform or other tool.

## Implications for practice and research

Previous research demonstrates that various organizations and governments implement online community care platforms with the aim of supporting (vulnerable) citizens<sup>3,5-9</sup>. Based on our findings, we must ask ourselves whether such platforms provide enough “added value” in their current form. Perhaps another direction is desirable, one in which online community care platforms primarily support existing offline initiatives to stimulate local participation, informal caregiving, and feelings of connectedness. An online community care platform would thus never be considered an end in itself, but as a means to achieve certain goals. We believe that online community care platforms can add value when they encompass the following characteristics: (1) the platform’s primary objective is to provide access to offline services in a neighborhood, (2) the platform mainly has a facilitating and intermediary role and, for example, connects “help requests” of older adults or (vulnerable) citizens with available local resources (e.g., other citizens, volunteers, and professionals from health care organizations), and (3) human representatives of the platform are physically present in the neighborhood during set times, and offline communication (eg, by telephone or face-to-face interactions) is the primary form by which older adults may voice their help requests. In this model, the idea of a “one-stop shop” becomes the guiding principle underlying an online community care platform, that is, all local help requests and local resources from a neighborhood come together in one place.

Additionally, previous research indicates that many (eHealth) apps (such as certain functionalities of the online community care platform) lack a clear theoretical basis and do not provide any evidence concerning their effectiveness and usability<sup>20</sup>. In the further development of online community care platforms, it is advisable to pay more attention to the theoretical “rationale” of the platform and its functionalities. Another important recommendation regarding the future development and implementation of online community care platforms is to involve potential end users. Previous research stresses the importance of including users to constitute web-based communities that will be functional, usable, and accessible<sup>11,21,22</sup>. Finally, regarding the future development of online community care platforms, it is advisable that developers

continually rethink the platforms' features, make adjustments, and evaluate whether the functionalities are actually effective.

Further research is required to establish if online community care platforms have an impact on older adults' local participation, informal caregiving, and feelings of connectedness, and if so, the ways in which this impact is felt. Research should focus on the impact of different online community care platforms and on their impact on the group of older adults in all its variety: youngest-old, middle-old, and oldest-old; frail and healthy; highly and poorly educated; and internet-skilled and unskilled. Finally, since platforms often focus on all inhabitants of a neighborhood to create an interdependent support system where old and young people are facilitated to help each other, further work should also focus on researching the impact of these platforms on user groups other than older adults.

Finally, it would be interesting to study the impact of the current coronavirus pandemic on the adoption and use of web-based platforms. Perhaps the pandemic may lead to an increased use of these platforms, as it has led to a striking adaptation of various eHealth services in community care (which used to have a history of strenuous and slow adoption and implementation).

## Acknowledgments

The authors thank the members of the project group "Meedoen in Grubbenvorst" (Peter Jacobs, John Rietman, Willemien van Gardingen, Ruud Meijers, Mieke Cruisberg, and Kees Cligge) for their help in recruiting participants and for providing feedback on the questionnaire. Finally, we thank Stephen Potter for checking the manuscript as a native English speaker.

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# Chapter 6

## Online community care platforms for older adults: opportunities and barriers

*The following article is an adaptation of an original paper published in the Dutch professional journal Gerōn. In this edited version the methodology has been explained in more detail for the sake of clarification. Furthermore, the edited version now follows the structure of introduction, methods and results.*

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## Introduction

Many online community platforms have been introduced in the Netherlands aimed at enabling community-dwelling older adults to participate locally and to stimulate mutual informal care. The implementation of such platforms is challenging. We brought together municipalities, care and welfare professionals, entrepreneurs, and local residents of various platform initiatives in the Netherlands in order to jointly identify the opportunities and barriers in the implementation of online community platforms and to arrive at recommendations for successful implementation.

## Online community platforms

In an ageing society, older adults are expected to take care of themselves, if possible together with their social network, before addressing formal care<sup>1</sup>. Online community platforms have the potential to support older adults to meet these new expectations<sup>2-5</sup>. In recent years, dozens of such platforms have been introduced in the Netherlands, such as 'MijnBuurtje', 'WijkConnect' and 'Gebiedonline'. These platforms have various goals: strengthening social cohesion, supporting local participation and stimulating mutual informal care and the provision of local services<sup>6</sup>. Through these online platforms, members of a community, including older adults, can use several applications. A few examples are:

- a) a tool for the exchange of informal care, often called 'supply and demand' or 'help each other';
- b) a local calendar where information on local events and activities can be found, and
- c) an application where users can find information on available healthcare and welfare services.

Community-dwellers who want to use an online platform almost always have to register by creating an online profile; usually free of charge. Figure 6.1 illustrates an example of an online community platform.

## Variety in implementation

Community platforms are initiated and implemented by various groups such as municipalities, care and welfare organisations, entrepreneurs or local residents. In most cases representatives of these groups participate in 'implementation teams'. Professionals who participate in these teams vary, such as community workers, municipality-agents, district nurses, social workers and youth consultants. Next to differences between initiators and (the composition of) implementation teams, there is

also variation in the software of the platforms, and the adopted implementation strategies. Sometimes platforms are implemented *top-down*, where professionals or a municipality initiates, without participation of residents. Platforms can also be initiated and implemented *bottom-up* by community-residents. In the latter strategy other residents and professional organisations are often involved at a later stage. Finally, a *mixed-methods* strategy was sometimes chosen. Here the initiative is taken by health care or welfare organisations or a municipality and the implementation takes place in close cooperation with community-residents.



Figure 6.1 Screenshot of an online community platform in Heerlen, community Molenberg (software; Cubigo).

## Methods

In preparation for the conference, project leaders of three different initiatives were interviewed. Two of these initiatives were in the south of the Netherlands (in a village and in an urban environment) and one in the Dutch province of Gelderland (in a medium-sized city). All three initiatives used the same software infrastructure ("Cubigo", see [www.cubigo.nl](http://www.cubigo.nl)), each was in a different implementation phase and each had a different implementation strategy.

Semi-structured interviews were performed with the project leader(s) of the three above described initiatives. During these interviews the following topics were explored: a. *Background of the initiative* (e.g. development and formation of the initiative, purpose and intended result of the online platform); b. *Opportunities and barriers in the implementation of the platform*; c. *Technology of the online community platform* (e.g. available functionalities, revenue model, needs assessment prior to implementation); d. *Implementation team*; e. *Target group* (e.g. strategies used to in order to reach and involve the target group); f. *Collaborating partners*. The interviews were transcribed non-verbatim and were analysed using conventional content analysis<sup>7</sup>.

The three interviews gave insight into the experiences and advantages and disadvantages of the different implementation strategies. These results provided input for the conference with various members of implementation teams with the aim of discussing their experiences regarding the implementation of online community platforms.

In addition to the three initiatives that were interviewed, three other initiatives were invited to the conference. As a result, there were 6 initiatives represented at the conference and 20 people attended. The conference was set up as follows. Firstly, the audience received two informative presentations. That is; a presentation on the available online platforms in the Netherlands at that time<sup>6</sup> and a presentation on the results of the interviews with the project leaders. Secondly, sessions were organised with two groups of 10 participants. Both sessions were supervised by a moderator and a research assistant who took field notes. The same topics as in the interviews with project leaders were explored in the conference sessions. The resulting field notes were consequently incorporated into a report (titled 'Conference Report Implementation of Online Community Platforms; The Do's and Don'ts') which formed the basis for the current article.

## Results interviews with project leaders

The project leaders had similar experiences regarding the obstructing and facilitating factors in the implementation of these platforms, despite the variety in teams, software, and implementation strategies. It turned out to be a great challenge to reach out to community-residents and to stimulate them to (continue to) make use of their online community platform. Based on the interviews with the project leaders, barriers with regard to various aspects of the implementation were identified. For instance, it

appeared to be challenging to gain *commitment and cooperation from the collaborating partners* (such as care and welfare organisations, municipalities, local entrepreneurs, citizens' initiatives and associations for older adults).; active contributions were scarce. Additionally, barriers were identified with regard to the *embedding of online platforms in the community*, whereby 'connecting' to (the network of) the intended target group and connecting 'real-life' activities with the online platform was seen as the primary barrier. Barriers were also experienced with regard to *feelings of ownership and the revenue model*; the responsibilities of each involved collaborative partner and the business case of the online community platform were not delineated. The *staffing of (implementation) teams* also caused difficulties, it was especially a challenge to recruit enough volunteers and professionals to achieve the very labour-intensive implementation. Furthermore, project leaders mentioned problems regarding the *software*; working together with software suppliers to, for example, customize software or give access to user reports was difficult. Finally, barriers were mentioned with regard to *digital skills*: not all (potential) end users actually had the necessary digital skills to be able to use an online community platform.

## Conference results

During the conference the barriers described above were further explored in sessions. The following recommendations were formulated for other (and future) implementation teams.

### Recommendations for enhancing commitment and collaboration

The shifting and changing role of professionals has had a substantial influence on the implementation of online community platforms. This role is changing partly due to transitions in the domain of care and welfare. Professionals are not yet sure about their new role and it is therefore difficult to assess whether a tool such as an online community platform has added value for them. In this sense, there seems to be a paradox between the 'assignment' that the care domain has versus the 'awaiting' role that organisations take on. Co-creation can be a valuable method for identifying and adopting the needs and wishes of professionals. The online community platform should be positioned as a tool that makes the work of community-professionals (e.g. community workers and district nurses) easier. By assuming this position, the platform will not be seen as an 'additional registration or ICT system'. Likewise it was recommended that, prior to implementation, to create an overview of the involved

stakeholders (collaborative partners) and to discuss and establish the values of an online platform, the conditions needed to achieve these values and to establish an appropriate revenue model. The last recommendation regarding commitment and collaboration relates to the fact that an online community platform can be a valuable method to stimulate the local participation of vulnerable citizens and a good way to strengthen social cohesion and reciprocity in a community. Municipalities can therefore embrace online community platforms and make them part of the implementation of the Dutch Social Support Act (Wmo 2015).

## Recommendations for embedding the platform in the community

During the conference, it became clear that, partly due to the complexity of implementation, the attention of the implementation teams was too strongly focused on the platform by and of itself, while it should actually be *a tool* for supporting (vulnerable) community-dwellers. Based on this observation, the following recommendation was made: the focus of 'platforms' should lie on *offline* services and support. This support can consist of people who are physically available to answer user-questions. Such as, a community manager (an individual with the assignment to supervise the implementation of an online community platform), a community-connector (a person who interconnects residents, entrepreneurs, organisations and the municipality), a telephone helpdesk or consultation hours at, for example, a community-home. An online platform is a means to connect community-dwellers, and a way to inform them about available services or meaningful activities in the immediate vicinity.

## Recommendations for increasing feelings of ownership and the revenue model

Community residents only develop feelings of ownership when an online community platform adds value for them. Creating a sense of ownership is an important challenge in the implementation and an important condition for wide-spread use. To increase the sense of ownership and find a good revenue model, the following recommendations were made. For the sake of continuity, it is important to establish legal and organisational ownership, for example by setting up a separate foundation. An online community platform can and should operate independently via a foundation and serve all collaborative partners (such as the municipality, care and welfare organisations and local residents). In that case, the online community platform offers services that are tailored to the objectives of the collaborative partners, consequently creating valuable

services. The partners will then want to purchase services for a fee, becoming paying customers, and as a result local residents can continue to use the platform free of charge. Finally, investors (such as municipalities, local entrepreneurs or care and welfare organisations) often ask for the revenue model. Only if the revenue model of online community platforms is established organisations will invest. The problem is that revenue models have not yet been effectively proven or established.

## **Recommendations on software and digital skills**

The conference revealed several recommendations regarding the software and digital skills of platform users. First of all, the digitally low-skilled user should be able to consult someone in 'real life'. A very intensive 'outreach' approach is needed via which digital skills training is promoted and offered. The intermediary (e.g. an informal caregiver, volunteer or professional) is an important individual to play a role in reaching digitally low-skilled users, to inform them about the existence of the platform and to instruct them about its operation. Finally, the intended target group and/or geographical demarcation (neighbourhood, district, village or city) determines the extent to which it is necessary to support users with regard to their digital skills (for example, the 65+ target group requires less intensive support with regard to these skills than the 85+ target group).

## **The future of online community platforms**

Two of the three platforms whose project leaders were interviewed are no longer available. A large number of other online community platforms also ceased to exist<sup>2</sup>. This development and the described barriers illustrate the complicated challenges faced by implementation-teams. Nevertheless, there are also online community platforms that seem to have acquired a fairly solid ground, such as 'MijnBuurtje' and 'WijkConnect' ([www.mijnbuurtje.nl](http://www.mijnbuurtje.nl); [www.wijkconnect.com](http://www.wijkconnect.com)). These platform distinguish themselves by offering a format that can be customized for each participating community. Moreover, they strongly invest in guiding the implementation process<sup>2</sup>. In doing so, they tackle a number of barriers that were described in the current article. For both these and new initiatives in this field, we believe it is important that online community platforms mainly support existing 'real-life' local initiatives, in a facilitating and intermediary manner. By assuming this role, the chance of successfully implementing a sustainable platform is increased. Whether and to what extent they will actually have an impact on social cohesion, participation of local residents, mutual

informal caregiving and the provision of local services, remains to be seen. To establish the actual impact of online community platform further research is needed.

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# Chapter 7

General discussion



## General discussion

The transition from a welfare state to a participatory society has a broad social impact; community-dwellers and their family are increasingly asked to take care of each other as formal institutions are less and less able to do so. The increasing emphasis on the importance of ageing-in-place is influenced by policy and by the preferences of older adults themselves; living independently in their own home makes older adults feel like useful, valued members of society<sup>1</sup>. Online community care platforms are seen as a promising means of support; they provide opportunities for older adults to make ageing-in-place and civic participation more achievable, as it is anticipated that these support them to access community resources<sup>2</sup>. However, there is still a lot of uncertainty about their added value and large-scale implementation. Community care platforms are until now barely used, despite considerable efforts to implement them. In addition, no studies have been conducted yet on understanding what drives (dis)continued use once these platforms have been implemented. Therefore, the following questions were central to this dissertation: 1) What are the needs and requirements of older adults with regard to an online community care platform?; 2) Which online (health)care platforms for older adults are available and what are their characteristics?; 3) What are the experiences and perceived impact of older adults regarding an online community care platform?; and 4) What are experiences and lessons learned from other initiatives that implemented online community care platforms? The overall aim of this dissertation was to evaluate user-centred developed online platforms for community-dwelling older adults to participate in their community. The current chapter outlines our main findings, followed by methodological and theoretical reflections. Finally, implications for policy and practice as well as recommendations for future research are described.

## Main findings

In this dissertation several online care platforms for community-dwelling older adults were evaluated. These platforms used the Cubigo software infrastructure and were aimed at supporting civic participation on a community level. They fulfilled user(-interface) requirements and conformed to important prerequisites reported in previous research on online communities for older adults. We explored the use, experiences and perceived impact among older users of these platforms.

The use of the platforms was generally low and we noticed a decrease in use over time. If the platform was used, the most consulted functionalities were the ones related to communication (e.g. messaging, contacts) and information about the community (e.g. local activities, photos and videos). When exploring the reasons for older adults to not use online platforms we discovered various motives, i.e.: the platform was regarded as an innovation that was 'externally developed' and feelings of ownership were virtually non-existent; the platform was not seen as accessible or user friendly and its information content as either out-dated or as not matching expectations; there was a lack of identification with the proclaimed target group and there was no perceived need for the platform goals; e.g. network expansion and civic participation. Only a small minority of the participating older adults indicated that the platform had added value for them. Furthermore, participants' perceived impact of the platform was significantly lower than their initial expectations of the impact the platform would provide regarding its indented outcomes (e.g. supporting-helping individuals and mutual informal volunteering).

Throughout our studies it appeared that implementation teams in the Netherlands experienced barriers in the implementation of their online community care platforms. It was a challenge to reach out to community-dwellers and to stimulate them to (continue to) make use of their platform. The teams experienced barriers in relation to: the commitment and cooperation from the collaborating partners, the embedding of online platforms in the community, feelings of ownership, the revenue model, and digital skills of older adults.

Based on the results of the studies in this dissertation, it can be concluded that online community care platforms which used the Cubigo software infrastructure were not effortlessly accepted or adopted by community-dwelling older adults; they were barely used and it seems that these platforms had a minimal, if any, impact on ageing-in-place and civic participation. It is however unclear whether these outcomes would have been different for platforms using other software infrastructures as we did not investigate these. In any case, various platforms experienced several major barriers regarding the adoption and implementation of online platforms, such as ambiguity regarding their purpose and benefits and a lack of an actual perceived personal need for online care platforms to age-in-place.

## Methodical considerations

In this section some methodological considerations regarding the action research approach, the involvement of older adults and measuring the impact of online platforms will be discussed.

### Action research approach

In this dissertation action-orientated research approach was seen as “...*not so much a methodology, but as an orientation to inquiry that seeks to create participative communities of inquiry*<sup>3</sup>”. This approach seeks to simultaneously achieve a process of change, learning and knowledge development. Several of our studies, i.e. those regarding the development and implementation of Cubigo (chapters 2 and 4) were highly participatory in nature and have brought about change by implementing online community care platforms in neighbourhoods; together with, and based on contributions from participative communities and stakeholders. Working together with local older adults and other stakeholders the online platforms were designed, developed and evaluated. Consequently, we learned and developed knowledge regarding ‘the change’ via an iterative process *during* our research. Furthermore, throughout the research community-dwelling older adults were provided with support concerning their digital skills. Offering such support mechanisms during a research project is typical for action research: it aims to ‘empower’ people with limited skills or knowledge in a particular area<sup>4</sup>. Another important element that fits the action research approach: we were changing the real-life setting together with people originating from that same setting. Furthermore, the researcher and other contributors such as the initiators in Grubbenvorst and the community manager in Molenberg actually experienced what happened in the real-life setting. These real-life experiences subsequently provided input for the researcher to determine the central research questions and topics. In other words, our studies were approached from an inductive research perspective. Lastly, mainly during the study in which the use of the Molenberg platform was evaluated, we paid overt attention to the *situatedness of the research* and corresponding results. The Consolidated Framework for Implementation Research (CFIR) in particular lent itself well to systematically gain insight into this situatedness, i.e.: by linking results to constructs such as ‘the inner setting’ and ‘structural characteristics’ of a community. Paying overt attention to this situatedness is a strength since research within the specific context of ageing is scarce<sup>5</sup>.

Although we have adequately applied many elements of the action research approach we could have improved our approach with regard to several components. Perhaps we

could have more meticulously recorded critical self-reflections using a tool such as a reflexive journal, which in turn would have aided to explicitly evaluate our role and impact on our studies<sup>6</sup>. Also, in our articles we could have explicitly incorporated the action research approach as being part of the designs. Lastly, Corrado et al.<sup>7</sup> conclude in their critical interpretive synthesis of participatory action research (PAR) with older adults that within PAR older adults are often not included as full research partners as they typically do not have an opportunity to shape research questions. Although our research placed great emphasis on inductively constructing research questions, older adults had no direct say in shaping these questions. Furthermore, as will be illustrated in the next section, the action research approach as applied in this dissertation has, despite our extensive efforts to do so, not ensured that involved users perceived themselves as partners.

## **Involvement of older adults**

User-centred design is seen as a promising strategy especially with regard to the development of technologies for ageing-in-place<sup>8-9</sup>. The prospects are that involving end-users produces a better 'fit' between what users require and a developed technology. Moreover, it is generally agreed that the usability and satisfaction regarding products which are user-centred designed, are valued higher than products that are not<sup>10</sup>. In two studies we applied (elements of) user-centred design both implicitly and explicitly; we involved potential users, actual users and community-dwellers in the development and repeated evaluations of online community care platforms. The developed platforms largely fulfilled user requirements established by prior research and complied with user requirements as identified in our studies. In the case of the Molenberg study, the platforms' content was even determined by various professionals and community-dwellers. In spite of all this, the developed platforms did not turn out as a good fit for the end-users.

Looking back, despite all our efforts to involve users and community-dwellers in the development and implementation process, we possibly did not have sufficient in-depth understanding of the wishes and needs of the users. In the current scientific discourse, user-centred design is perceived as one of the first but rather outdated ways of involving users. As Sumner, Chong, Bunde and Lim<sup>11</sup> describe: the user-centred design approach largely refers to a rather passive form of end-user involvement. Currently more in-depth ways of involving users in the development of technologies are practiced, such as co-design or designs in which users are involved from the outset as partners rather than merely as feedback providers. Although we have tried in



various ways to "make" partners out of various community-dwellers and older adults, they have probably not experienced (or wanted) it that way.

Real-life settings and associated needs of people within these settings change over time. Therefore, in a *change process* it is of importance to be aware that the setting in which a change is implemented is also *changeable* itself<sup>12</sup>. Although several involved older adults had initially expressed the belief that they would possibly need an online community care platform in the future, it did not subsequently fulfil an actual need. Conceivably, we should have considered to ask a significant question prior to the user-centred development process: *Why do you want an online community care platform?* Truly knowing the profound wishes and problems of potential users imaginably provides a more realistic notion and knowledge base on which technologies can be developed. As one of our participants articulated: *"The things we were told sounded good. However, the final product turned out to be something else than expected"*. This raises several questions: was the fact that the platform became something else than expected due to the changeability of needs? Did we not adequately identify the true problems experienced by users in the first place? Or is something else going on here? We extensively involved users in various and numerous ways; we repeatedly asked them about their needs and wishes and adapted the online care platforms accordingly. Substantial user involvement and close cooperation with users seemed to have hardly any effect on the acceptance and use of the platforms. How is this possible? The users involved in our studies probably *did* expect that the online platform could offer them a tool to solve real existing problems. However, it did not. Perhaps the fact that these needs are *expected* also plays a major role here. If technologies for ageing-in-place are developed based on expected needs, i.e. needs that will *possibly exist* in the future, there is a risk that these expected needs will not materialise. This means that that there possibly will eventually be no need for the developed technology. Developing on the basis of possible needs then becomes an uncertain affair. So does it make sense to ask potential users if they expect any added value? Is it wise to develop technologies based on expectations that may not materialise? And is it really then remarkable if technologies do not turn out as a good fit?

## Measuring the impact of online community care platforms

In order to assess whether a technology actually contributes to its intended outcomes it is key to choose outcome measures that actually represent the aims of the intervention. Online community care platforms all aim to support civic participation (e.g. informal mutual volunteering and supporting helping individuals ) in order to make ageing-in-place more achievable.

However, as the Molenberg platform was barely used we could not investigate the impact of this platform on its intended outcomes. To overcome that, a different emphasis was chosen; qualitative data was gathered that gave detailed insights into the motives of older adults primarily for not using the platform. The Consolidated Framework for Implementation Research (CFIR) was applied because it lent itself particularly well to assemble a holistic and comprehensive description of these motives. The choice was made to approach data collection from an inductive perspective, i.e. barriers regarding the use of the online platform were identified in the real-life setting and translated into CFIR constructs to be explored during our research. Furthermore, the framework offered the opportunity to discover important and less apparent constructs that were related to the (stagnation of) use. In addition, we did briefly inquire whether participants experienced impact regarding the platform initial aims, e.g. civic participation and feeling connected to the community.

In the study regarding Grubbenvorst-Online the aim was to measure its perceived impact regarding local participation, informal caregiving, social networking, and feelings of connectedness. As there were no validated questionnaires available to measure the expectations and perceived impact of online community care platforms, we developed the questionnaire. It is complicated to directly attribute social outcomes such as civic participation to an intervention. Hertzog and Light<sup>13</sup> suggest “the need for definition of terms and selection of measures that are sensitive to the particular kinds of benefits that are anticipated when a technology is implemented”. Our developed questionnaire did not measure the direct impact of online community care platforms on civic participation. However, we did not intend to demonstrate actual causality between the Grubbenvorst-platform and its intended outcomes but instead aimed to illustrate how older users perceive the use and impact of an online platform. The study contributes to knowledge about the perceived impact of an online community care platform and about its actual use after implementation.

## **Theoretical considerations**

In this section theoretical considerations regarding the added value and impact of online community care platforms and their implementation will be discussed.

### **Perceived added value and impact of online community care platforms**

In order to interpret the results of our studies regarding the perceived added value and impact of online community care platforms, we considered relating our findings to

several established models such as the Technology Acceptance Model 2 (TAM2) or the Unified Theory of Acceptance and Use of Technology (UTAUT). We however felt that these models did not provide a good fit, since they are mostly related to the implementation of technologies within organisational settings. Peek et al.<sup>5</sup> likewise mention several reviews which conclude that these models are “*missing essential predictors of technology use that are specific to community-dwelling older adults*” such as social, behavioural, psychological and contextual factors. Consequently, in this discussion we relate our findings to the ‘*conceptual model of factors influencing the level of technology use by older adults who are ageing-in-place*’<sup>5</sup>. The major themes within this model are: 1) challenges in the domain of independent living; 2) behavioural options; 3) personal thoughts on technology use; 4) influence of the social network; 5) influence of organizations; 6) and the role of the physical environment. In our findings we find only two of these themes: behavioural options and personal thoughts on technology use.

During our first study, we found that the platform hardly had any added value for the participating older adults. A noticeable added value was neither found in our other studies. What, however, was found: older adults, if interested at all, were mainly interested in functionalities aimed at communicating with their own existing social network. An important question here is whether these communication-functionalities should be made accessible via platforms. Perhaps precisely these kind of functionalities can be found elsewhere, independently of online platforms (e.g. FaceTime or WhatsApp). Moreover, they are already freely available, widely known and trusted. Correspondingly, Knowles and Hanson<sup>14</sup> describe that older adults often distrust technologies they do not know or are less familiar with. Another finding illustrates that older adults did experience, although very limited, impact in terms of feeling connected and being informed. The platforms gave older adults the possibility to inform themselves about local activities and news. Again the question rises whether an online platform is needed to provide older adults with information about their community(activities); perhaps a more general online communication tool (e.g. a website) is sufficient to accomplish this. We also noted that simply 'knowing of the platform' created positive feelings for older adults; apparently *something* was happening in their community. These positive feelings may be similar to the Hawthorne effect: merely taking part in a new activity (i.e. an experiment or study) can have a positive effect, i.e. by participating in something special, a person feels special and makes something special out of it. Positive results then have little to do with the online community care platform in itself and are more related to participating in a study. These findings relate to the theme ‘*Behavioural Options*’ of the conceptual model of

Peek et al.: the use of one type of technology often competes with the use of other types of more familiar technologies.

A major finding was that almost all older adults in our studies regarding the Molenberg and the Grubbenvorst platform indicated that they did not need online platforms to age-in-place; they felt no support-need for the desired outcomes of the platform. Older adults experienced no need for care from fellow community-dwellers nor did they feel a need to expand their social network. As Peek et al.<sup>15</sup> correspondingly describe: the perceived personal need of community-dwelling older adults continues to play an important role in their technology acceptance and that if older adults don't use a technology they often see no need for it (*theme Personal Thoughts on Technology Use*). Peek et al. also describe that a lot of older adults do not have to make use of technology because they can handle things on their own<sup>5</sup>. Conceivable, the limited use and impact of online community care platforms is related to this limited need for online support. This finding relates to the theme '*Behavioral Options*': older adults often have alternatives that compete with the use of technology, such as members of their existing social network. These findings imply that platforms are possibly not suited for every older adult as such platforms have goals that not every older adult will share; not all older adults need online support or require help to find offline support regarding civic participation or to request the assistance of others. Based on our findings, we can conclude that older adults who are still healthy, self-reliant, and internet-skilled seem to be able to find their own means of solving problems and arranging informal care, i.e. via alternatives. In addition, as the older population only becomes more digitally proficient, the question is whether a tool such as an online platform is really necessary to support them.

Another important finding is that the participating older adults did not identify themselves with the proclaimed target-group. They indicated that they themselves did not need the community platform, however other older adults might. The platform was perceived as intended for other people; for 'old people who are sick and frail'. This whilst the platform was hardly positioned as meant for frail older adults by the researchers. This finding is consistent with results from the review of Tsertsidis, Kolkowska and Hedström<sup>16</sup> in which the reviewed literature showed that older adults are concerned about stigmatization; older adults sometimes felt that technology "*would make them feel older or more fragile, or that their social milieu would think they are frail since they need to use a technology*"<sup>p329</sup>. Nelson<sup>17</sup> would conceivably relate this to the concept of 'ageism' and a fear of our future self. Denying that one is part of the group older adults helps people deny their mortality: "*because older people tend to be associated with death persons may adopt ageist attitudes and behaviours to distance themselves from older people. Doing this may allow the person to deny the reality that*

*they too will eventually become (or already are a) part of that outgroup<sup>p214</sup>*. This finding relates to the theme *Personal Thoughts on Technology Use* of the conceptual model of Peek et al.<sup>5</sup>: older adults indicate that the use of technology can make them feel old and that they do not want to be seen as an incapable old person.

Finally, we should ask ourselves whether placing an excessive emphasis on older adults to rely on themselves and to participate at much as possibly, will do them justice. Participating locally or ageing-in-place is not desirable or realistic for *every* older adult<sup>18</sup>. Perhaps the truly frail older adults can barely participate anyway and will always have to fall back on formal care provision and support. Throwing frail older adults fully back onto themselves is impossible and objectionable. In addition, if civic participation is truly difficult for frail older adults, do they want to use a relatively unknown online community care platform to achieve this? By contrast, the older adults who are still relatively healthy and self-reliant do not need (technology) support at all; they arrange their lives themselves via alternatives or other more familiar technologies and will conceivably therefore not experience an added value, or need, for an online community platform to achieve ageing-in-place.

## Implementation of online community care platforms

As shown in the previous section, the implementation of the online community care platforms stagnated partly due to a lack of perceived added value and impact. Besides these barriers, we identified several others that influenced the implementation of online platforms: barriers regarding the commitment and cooperation with collaborating partners and the revenue model.

At the time we started our studies online community care platforms such as Cubigo were a relatively new phenomenon. Given our prior (research) experience regarding the use and implementation of technologies, we were aware of the fact that it would be a challenging and demanding process to thoroughly embed and implement online platforms in communities. It was precisely because of this fact however that we deliberately chose to take on an active role in implementing these platforms. In retrospect, we remained stuck in this active role for too long since we did not formally delineate the responsibilities and roles of each involved collaborative partner, nor the revenue model. We hoped that agreements regarding cooperation, responsibilities, roles of stakeholders and the revenue model would materialise along the way. Moreover, it was difficult to make agreements beforehand as we had yet to discover the influencing factors regarding the implementation of online platforms. In order to finance our active role we repeatedly collected small grants and municipal investments, which did not make the process and the perpetuation of the platform very sustainable.

Meanwhile, other online community care platforms (e.g. WijkConnect and MijnBuurtje) seem to have developed methods that are more sustainable regarding financial flows and the staffing of implementation teams. The entrepreneurs of MijnBuurtje find that the presence of community-connectors ('buurtverbinders' in Dutch) is a prerequisite for the success of a platforms' implementation. Prior to implementation volunteering community-dwellers are trained to become community-connectors via a three-day course. The 'connectors' set up and manage the platform, encourage fellow community-dwellers to participate online and are actively present in the community. Subsequently, MijnBuurtje actively supports the further growth of the online platform and the development of a connected community. They accomplish the latter in many ways, such as the provision of workshops for community-connectors together with civil servants. These workshops are mainly aimed at supporting civil servants in their new role (Ambtenaar 3.0.) in which they increasingly have to cooperate and communicate directly with citizens. The revenue model of MijnBuurtje is that municipalities pay for their product and the accompanying implementation support. When the team of community-connectors can operate independently, the municipality merely pays for the software. MijnBuurtje currently has implemented online platforms serving approximately 130 different Dutch neighbourhoods, communities, villages or cities.

WijkConnect adopted a similar approach in which various components facilitate the implementation process. For example, implementation teams across the country are brought together so that they can learn from each other. Moreover, if certain functionalities are developed, tested and validated in a certain area, they become freely available for other areas (i.e. community-driven-development). WijkConnect ensures the presence and availability of local ambassadors, and if community-dwellers want to use the platform they do not have to register. Finally, the language that is used in their platform actually reflects the area for which the platform is intended (e.g. village or neighbourhood). The revenue model of WijkConnect is that their product and the accompanying support is mainly paid for by welfare institutions (often in cooperation with municipalities). Interestingly, WijkConnect observed an increase in use during COVID-19. They suspect that this is partly due to care-professionals experiencing less resistance to communicate online with their target group. WijkConnect has implemented online platforms serving approximately 100 different neighbourhoods, communities, villages or cities.

The platforms as described above seem to have partially parried the barriers as identified in this dissertation. The implementation of MijnBuurtje and WijkConnect seems successful whereby it is noteworthy that they place a strong emphasis on supporting the implementation process and on actively involving and training community-dwellers to support their own community. Despite these successes in

terms of implementation strategies, the impact of these platforms on ageing-in-place remains to be seen.

## Future directions

Based on the results of this dissertation several recommendations for policy, practice and further research are presented below.

### Policy and practice

The Cubigo platform has since 2017 gradually shifted its focus. After several years of attempting to implement online platforms in communities according to the business-to-business-to-consumer model (i.e. B2B2C; a model in which business providers, operate, and maintain a platform to sell products and deliver services through intermediate business partners<sup>19</sup>), Cubigo concluded that the use and implementation of their platform appeared too slow to generate a solid return of investment. The Cubigo entrepreneurs experienced that investors but also providers of care and welfare services (such as municipalities, healthcare and welfare organisations or local entrepreneurs) were reluctant to invest or present themselves on Cubigo as too few people were actively using the platform. Simultaneously, potential users experienced that the information content or services offered on Cubigo were limited. The absence of interesting or relevant services or information (intended for users) due to the resistance of service providers to offer their products on the platform, which in turn was caused by the absence of active users on the platform, can be interpreted as the well-known (chicken or the egg) causality dilemma (that remained unsolved). After not succeeding to implement their platform in European communities (i.e. The Netherlands, Belgium and France), Cubigo found business in North America and Canada. In these regions, it is the 'normal' course of events for ageing adults to move into inpatient facilities such as senior living environments. These living environments are often populous, i.e. almost like small villages. Moreover, healthcare and welfare services are often already fully centralised. Cubigo developed an online platform for these environments so that their centrally organised services could be offered to older adults via an online platform. This new Cubigo platform offers functionalities such as a 'visitor management' system, which automates sign-in processes and monitors visitor regulations. Another example is a 'dining' functionality in which restaurant operations can be managed and via which senior residents can order food and make restaurant-reservations. Cubigo has implemented online platforms serving approximately 300

senior living environments. In line with Cubigo's experiences regarding slow adoption, implementation and a limited return on investment, the results of this dissertation indicate that online community care platforms which used the Cubigo software were indeed not effortlessly implemented, accepted or used. The initiators of other platforms shared similar implementation barriers (as illustrated in Chapter 6).

While Cubigo slowly made its way to North America and Canada, other online community care platforms in the Netherlands found a way to implement their platform on a broader scale, i.e. WijkConnect, MijnBuurtje but also the Grubbenvorst-Online (GO) platform. The latter switched from the Cubigo software to WijkConnect. The initiators of GO closely collaborate with their municipality 'Horst aan de Maas' which provides structural funding for GO. In the case of WijkConnect and MijnBuurtje too, municipal funding or funding from welfare organisations seems to be an important precondition. These findings suggest that there is a need for governments and welfare organisations to embrace these initiatives. We expect that such facilitation will also lead to potential users trusting these online community care platforms more.

Our recommendation for future implementation teams is that they pay overt attention to the personal, social, and physical context of older adults as their technology use is mainly determined by these contextual factors<sup>5</sup>. It is furthermore of importance to ensure that online communities represent their complex offline reality. This can be achieved by performing a comprehensive study on a community prior to implementation. Furthermore, community-dwellers should ultimately be in the lead, as we ourselves and as WijkConnect and MijnBuurtje likewise tried to accomplish and emphasize. After all, community-dwellers know their community best and benefit if fellow community-dwellers actively participate in their community and are willing to help each other. We expect that potential users will trust online community care platforms more if a fellow community-dweller involves them and invites them to use it. Developments vary; some platforms abandon the objective of supporting older community-dwellers in their civic participation while others continue to emphasize this approach. We simply do not know yet whether or not we should continue to implement online community care platforms for older adults. It is by now clear that potential users need to experience an actual support need. If older adults really want and need support to age-in-place by participating in their community, online platforms might just turn out to be a valuable means of support.

## Research

Based on the findings presented in this dissertation a key recommendation for future research is to adopt technology acceptance models that include social, psychological,



behavioural and contextual factors specifically related to ageing-in-place. The adoption of technology is mainly a social process, which is largely overlooked by classical technology acceptance models. Peek et al.<sup>5</sup> developed a conceptual technology acceptance model that has included influencing factors related to ageing-in-place. If researchers employ such models they will probably by design determine whether ageism, stigmatization, identification with the proclaimed target-group, perceived need, and the existence of non-technological alternatives, potentially threaten the acceptance and use of technology. It is of importance however that this model is further cross validated and refined to ensure that it is valid across different populations and contexts.

Moreover, as participatory action research (PAR) better fosters community mobilization for change and empowers and actively engages older adults<sup>7</sup>, further research should involve older adults via PAR, i.e. as co-researchers in all phases, including problem identification, selecting a research priority, conducting data collection and analysis, and disseminating results. Finally, further research needs to examine more closely the links between online community care platforms and civic participation. For studying these links it is important to develop validated instruments or questionnaires which measure the impact of technological interventions implemented in communities.

Further exploration and improved understanding of the issues above can support the implementation of online community care platforms and can help us better understand whether these platforms can actually contribute to ageing-in-place.

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# Addendum

Summary

Samenvatting

Impact paragraaf

Dankwoord

About the author

List of publications



## Summary

The main objective of this dissertation was to evaluate user-centred developed online platforms that can be used by community-dwelling older adults to participate in their community and to arrange mutual informal care and volunteering. In our studies we explored different platforms which all used the Cubigo software infrastructure. In our first study we developed an online platform together with potential users with the aim to establish important user requirements and to explore preliminary experiences of users (chapter 2). A few years later an online community care platform (called My Molenberg) was co-developed by us in Heerlen, a city in the south of the Netherlands (Molenberg neighbourhood, approximately 4400 inhabitants). During the development process older adults living in Molenberg and several other stakeholders were frequently asked to provide feedback on the platform's functionalities. This premeditated 'user-centred' development and improvement of the platform was an intensive process that took over a year. Besides these platforms in which we were involved in the development, implementation and evaluation process, we also studied an already existing platform: Grubbenvorst-Online (abbreviated as GO, Grubbenvorst refers to the town in which the platform was implemented, with approximately 4790 inhabitants). GO was the initiative of an active group of local older citizens.

In **chapter 1** the main topics of the dissertation are presented. It provides relevant background information and elaborates on the concepts of ageing-in-place, civic participation, and how they relate to one another. The importance of community social capital and social cohesion to achieve ageing-in-place is clarified. In addition, the possibilities of technology for community-dwelling older adults are briefly illustrated. The online community care platform Cubigo, which was at the heart of our studies, is described in more detail. This chapter ends with the objectives of the dissertation and explains how the action research approach was adopted to achieve the latter.

**Chapter 2** provides insight into the needs and requirements of older adults and reports on a 6 months test-study which aimed to test the usability of an online community care platform. The study used a user-centred design in which the development process involved three steps. Firstly, user requirements were identified via three direct observations and fourteen interviews. Secondly, an existing online platform was modified based on the resulting user requirements. Two companies collaborated in modifying that platform. Thirdly, a total of seventy-three older adults were invited to test a prototype of the online community care platform during 6 months, which comprised of two phases: a training phase and a testing phase. Regarding daily life and communication older adults indicated that they experienced limitations in their social

contacts and wished to have more face-to-face contact with their family, friends and community-members. They felt that telecommunication could improve their wellbeing and feelings of safety. The needs assessment resulted in requirements regarding 'functionalities' and 'technical requirements'. The distinguished needs and requirements led to the development of an accessible interactive online platform on a Standard PC, containing 11 functionalities. The platform functionalities 'contacts', 'services' and 'messaging' were by far the most frequently used. The use of the platform was at its highest during the first 2 weeks of the test phase and then steadily declined. Although the vast majority of the participants were positive about the usability of the platform, only a minority indicated that the platform had added value.

**Chapter 3** describes the results of a scoping review into the characteristics, goals and functionalities of available online care platforms in the Netherlands. Analysis of 765 potentially relevant documents led to a total of 21 different online care platforms being distinguished. Three main platform types could be identified: Community Care Platforms (9) which were all designed to support local communities by enhancing social cohesion and by encouraging informal care. Care Network Platforms (11) which were mainly designed to support (informal) caregivers who wished to coordinate assorted collaborations and (health) care issues for an older adult. And System Integrator Platforms (1) which had the capability of integrating existing services and functionalities into their own software. The majority of the platforms used a web-based format and were independent of any substantial hardware. The number of registered individuals varied per platform from between 1100 and 65000 persons. The costs for the purchase and the maintenance of the online platforms' software were mostly reimbursed by neighbourhood organisations, (health) care organisations, or by municipalities (17 out of the 21 platforms).

**Chapter 4** focuses on the online community care platform 'My Molenberg'. This platform met important prerequisites and user(-interface) requirements which were identified during a user centred development process with local residents and other stakeholders. Unexpectedly, the platform was barely used by older adults. The primary objective was therefore to study the experiences of older adults and their motives to reject or accept the platform. This study uses a qualitative design in which seventeen users and non-users of the online community care platform were interviewed in focus groups. The Consolidated Framework for Implementation Research (CFIR) was adopted for the interview guide development and directed content analysis. The results of the study show only one motive for accepting the platform, that is, the mere existence gave participants the feeling that something positive was happening in their community. However, all other results indicated motives for rejecting the platform. Major motives were: (1) the platform was regarded as an innovation that was



'externally developed' and feelings of ownership were virtually non-existent; (2) the platform was not seen as accessible or user friendly and its information content as either outdated or as not matching expectations; (3) there was a lack of identification with the proclaimed target group and there was no perceived need for the intended outcomes of the platform. Finally, no positive impact was experienced regarding civic participation, feelings of connectedness or social cohesion. Unfortunately, the online community care platform was largely rejected whilst it conformed to user(-interface) requirements. A general need assessment or simply involving end-users is insufficient to successfully implement online community care platforms.

**Chapter 5** describes a pretest-posttest observational study that was conducted to investigate the self-reported use, expectations and perceived impact among forty-seven older users of a Dutch online community care platform called Grubbenvorst-Online (GO). Two postal questionnaires (at the start of the study and 4 months later) were used to collect reports of older adults. The comparison of the expectations and perceived impact of GO was tested with the McNemar test. The results of this study revealed that the functionalities regarding communication (e.g. messaging) and information about the Grubbenvorst community (e.g. columns and interviews) were the most frequently used at both the pretest and the posttest. Only a minority of the participants indicated that they used the aforementioned functionalities on a regular or daily basis. In general, the use of the online community care platform decreased during the 4-month follow-up period. At the posttest, participants' perceived impact of GO was significantly lower than their initial expectations of the impact the platform would provide regarding "information provision about Grubbenvorst," "seeking help from fellow villagers," "giving help to fellow villagers," and "consulting care or welfare services." This study shows that based on the outcomes of this study, it can be concluded that GO did not provide enough "added value" in its current form and that older adults who are still healthy, self-reliant, and internet-skilled seem to be able to find their own means of solving problems and arranging informal care.

**Chapter 6** presents the findings of a conference in which the influencing opportunities and barriers regarding the implementation of online community care platforms were examined. In preparation for the conference semi-structured interviews were performed with three project leaders of teams that implemented online community care platforms; the results were used as discussing points for the conference. The project leaders had similar experiences regarding the obstructing and facilitating factors in the implementation of online community care platforms. It appeared to be challenging to gain commitment and cooperation from the collaborating partners. Recommendations were to adopt co-creation methods for identifying and adopting needs and wishes. Additionally, barriers were identified with regard to the embedding

of online platforms in the community, whereby 'connecting' to (the network of) the intended target group and connecting to 'real-life' activities, were seen as most important. Partly due to the complexity of implementation, the attention of the implementation teams was too strongly focused on the platform by and of itself, while it should actually be a tool for supporting (vulnerable) community-dwellers. The focus of platforms should therefore lie on offline services and support. Barriers were also experienced with regard to feelings of ownership and the revenue model; the responsibilities of each involved collaborative partner and the business case of the online community care platform were not delineated. Financial investors often ask for the revenue model. Only if the revenue model of online community care platforms is established organisations will invest. The problem is that revenue models have not yet been effectively proven or established. Finally, barriers were mentioned with regard to digital skills of older adults. A recommendation to overcome this barrier was that the digitally low-skilled user should be able to consult someone in 'real life'.

The general discussion in **chapter 7** provides a reflection on the main findings of the conducted studies. In addition, some methodological considerations concerning the action research approach, the involvement of older adults and measuring the impact of online platforms are addressed. Theoretical considerations in relation to the added value and impact of online community care platforms and their implementation are also discussed. The chapter concludes by providing implications for policy, practice and research.

The studies revealed that online community care platforms using the Cubigo software infrastructure were not effortlessly accepted or adopted by community-dwelling older adults and it seems that these platforms had a minimal, if any, impact on ageing-in-place and civic participation. It is unclear whether these outcomes would have been different for platforms using other software infrastructures as we did not investigate these. Developments vary; some platforms abandon the objective of supporting older community-dwellers in their civic participation while others continue to emphasize this approach. We do not know yet whether or not we should continue to implement online community care platforms for older adults. If older adults really want and need support to age-in-place by participating in their community, online platforms might be a valuable means of support. Future initiatives or organisations that do want to implement platforms are advised to support the implementation process intensively. Moreover, further research should adopt technology acceptance models which include social, psychological, behavioural and contextual factors specifically related to ageing-in-place.





## Samenvatting

In dit proefschrift worden de resultaten beschreven van een studie die online wijkplatformen voor thuiswonende ouderen evalueert die werden ontwikkeld op basis van wensen en behoeften van eindgebruikers. Middels deze online wijkplatformen worden ouderen gestimuleerd om maatschappelijk te participeren en wordt gepoogd om in wijken vraag en aanbod van inwoners bij elkaar te brengen. Via deze online platformen kunnen wijkbewoners, zo ook thuiswonende ouderen, verschillende applicaties raadplegen. Een aantal voorbeelden van deze applicaties zijn: een tool voor de uitwisseling van informele hulp, vaak ‘vraag en aanbod’ of ‘elkaar helpen’ genoemd en een lokale agenda waar informatie te vinden is over evenementen en activiteiten (zoals een koffie-uurtje of wandelgroep). In onze deelstudies onderzochten we verschillende online wijkplatformen die allemaal gebruik maakten van de Cubigo software-infrastructuur. Allereerst stelden we samen met potentiële gebruikers belangrijke gebruikerseisen voor online wijkplatformen vast en kregen we inzicht in de eerste ervaringen van eindgebruikers. Enkele jaren later werd een online wijkplatform (genaamd “Mijn Molenberg”) mede door ons ontwikkeld in Heerlen (buurt Molenberg, ongeveer 4400 inwoners). Naast deze platformen waarbij we betrokken waren in het ontwikkel-, implementatie- en evaluatieproces, hebben we ook een ander platform bestudeerd: Grubbenvorst-Online (Grubbenvorst is een dorp in Noord-Limburg met ongeveer 4800 inwoners). Grubbenvorst-Online is het initiatief van een actieve groep burgers uit Grubbenvorst.

In **hoofdstuk 1** worden de belangrijkste thema’s van het proefschrift gepresenteerd. Er wordt relevante achtergrondinformatie gegeven en er wordt nader ingegaan op oud worden in de eigen omgeving en maatschappelijke participatie en hoe deze onderwerpen zich tot elkaar verhouden. Het belang van sociaal kapitaal en sociale cohesie in buurten en wijken om oud worden in de eigen omgeving te realiseren wordt verduidelijkt. Daarnaast worden de mogelijkheden van technologie voor thuiswonende ouderen toegelicht. Het online wijkplatform Cubigo, dat centraal stond in onze studies, wordt meer in detail beschreven. Dit hoofdstuk eindigt met de doelstellingen van het proefschrift en legt uit hoe actie-onderzoek is ingezet om deze doelstellingen te bereiken.

**Hoofdstuk 2** geeft inzicht in de behoeften en wensen van thuiswonende ouderen en rapporteert over een zes maanden durende studie die als doel had de bruikbaarheid van een online wijkplatform te testen. Het onderzoek werd opgezet volgens een user-centred design waarbij het ontwikkelproces uit drie stappen bestond. Ten eerste werden gebruikersbehoeften geïdentificeerd via drie directe observaties en veertien

interviews. Ten tweede werd een bestaand online platform aangepast op basis van de resulterende gebruikersbehoeften. Twee bedrijven werkten samen bij het aanpassen van dit bestaande platform. Ten derde werden in totaal 73 thuiswonende ouderen uitgenodigd om gedurende zes maanden een prototype van het online platform te testen. De in kaart gebrachte gebruikersbehoeften resulteerde in functionele en technische eisen voor het platform. Deze 'eisen' vormden de basis voor de ontwikkeling van een toegankelijk interactief online wijkplatform op een standaard computer met 11 functionaliteiten. De functionaliteiten 'contacten', 'diensten' en 'berichten' werden veruit het meest gebruikt. Het gebruik van het platform was het hoogst tijdens de eerste twee weken van de testfase en nam daarna gestaag af. Hoewel de overgrote meerderheid van de deelnemende ouderen positief was over de bruikbaarheid van het platform, gaf slechts een minderheid aan dat het platform toegevoegde waarde voor hen had.

**Hoofdstuk 3** beschrijft de resultaten van een scoping review over de kenmerken, doelen en functionaliteiten van beschikbare online platformen voor zorg en welzijn in Nederland. Analyse van 765 mogelijk relevante documenten resulteerde in 21 verschillende online platformen. Er werden drie typen platformen vastgesteld: 1) Online buurt- of wijkplatformen (n=9) die allen waren ontworpen om buurten of wijken te ondersteunen door in te zetten op het vergroten van sociale cohesie en het stimuleren van onderlinge informele zorg, 2) Zorgnetwerk- en coördinatieplatformen (n=11) die voornamelijk waren ontworpen om (informele) zorg rondom een thuiswonende oudere te coördineren, en 3) System Integrator Platformen (n=1) die de mogelijkheid hadden om bestaande diensten en functionaliteiten te integreren in hun eigen software. De meeste platformen gebruikten een web-based format en waren onafhankelijk van enige substantiële hardware. Het aantal geregistreerde gebruikers op deze platformen varieerde van 1100 tot 65.000 personen. De kosten voor de aanschaf en het onderhoud van de software werd meestal vergoed door buurtorganisaties, zorg- of welzijnsorganisaties of door gemeenten (17 van de 21 platforms).

**Hoofdstuk 4** richt zich op het online buurtplatform 'Mijn Molenberg'. Dit platform voldeed aan belangrijke randvoorwaarden en gebruikers(-interface)eisen die tijdens een user-centred ontwikkelproces werden vastgesteld. Tijdens dit ontwikkelproces werden thuiswonende ouderen uit Molenberg en verschillende andere belanghebbenden regelmatig gevraagd om feedback te geven op de functionaliteiten van het platform. Dit was een intensief proces dat meer dan een jaar in beslag nam. Desondanks werd het platform nauwelijks gebruikt door thuiswonende ouderen uit Molenberg. Het primaire doel van deze studie was om de ervaringen van thuiswonende ouderen en hun motieven om het platform al dan niet te gebruiken in kaart te brengen. Deze studie werd opgezet volgens een kwalitatief design waarbij

zeventien gebruikers en niet-gebruikers van het online platform werden geïnterviewd in focusgroepen. Het Consolidated Framework for Implementation Research (CFIR) werd gebruikt voor de ontwikkeling van de interviewguide en voor de directed content-analysis. De resultaten van het onderzoek laten slechts één motief zien voor de acceptatie van het platform: het beschikbaar zijn van het platform gaf de deelnemers het gevoel dat er 'iets positiefs' gebeurde in hun buurt. Alle andere resultaten wezen echter op motieven om het platform af te wijzen. De belangrijkste motieven waren: (1) het platform werd beschouwd als een innovatie die "extern ontwikkeld" was en gevoelens van eigenaarschap waren vrijwel afwezig; (2) het platform werd niet gezien als toegankelijk of als gebruikersvriendelijk en de informatie op het platform ofwel als verouderd ofwel als niet in overeenstemming met verwachtingen; (3) er was een gebrek aan identificatie met de doelgroep en er bleek geen behoefte aan de beoogde uitkomsten van het platform. Ten slotte werd geen positief effect ervaren met betrekking tot maatschappelijke participatie, gevoelens van verbondenheid of sociale cohesie.

**Hoofdstuk 5** beschrijft een pretest-posttest observationele studie die werd uitgevoerd om het gebruik, de verwachtingen en de ervaren impact te onderzoeken onder zevenenveertig oudere gebruikers van het online dorpsplatform Grubbenvorst-Online (GO). Twee vragenlijsten werden bij oudere gebruikers afgenomen (aan het begin van het onderzoek en 4 maanden later). De vergelijking van de verwachtingen en de ervaren impact van GO werd getoetst met de McNemar test. Uit de resultaten van dit onderzoek bleek dat de functionaliteiten met betrekking tot communicatie (bijv. berichten) en informatie over het dorp Grubbenvorst (bijv. columns en interviews) het meest werden geraadpleegd bij zowel de pretest als de posttest. Slechts een minderheid van de deelnemers gaf aan regelmatig of dagelijks gebruik te maken van deze functionaliteiten. In het algemeen nam het gebruik van het online platform af tijdens de vier maanden na de pretest. Tijdens de posttest was de ervaren impact van GO bij de deelnemende ouderen significant lager dan hun aanvankelijke verwachtingen van de impact die het platform zou hebben met betrekking tot 'informatievoorziening over Grubbenvorst', 'hulp zoeken bij dorpsgenoten', 'hulp geven aan dorpsgenoten', en 'raadplegen van zorg- of welzijnsdiensten'. Op basis van de uitkomsten van dit onderzoek kan geconcludeerd worden dat GO in de huidige vorm onvoldoende "meerwaarde" heeft en dat oudere volwassenen die nog gezond, zelfredzaam en internetvaardig zijn, in staat lijken om zelfstandig problemen op te lossen en informele zorg te organiseren.

**Hoofdstuk 6** presenteert de resultaten van een conferentie waarin de kansen en uitdagingen inzake de implementatie van online wijkplatformen werden onderzocht. Ter voorbereiding op de conferentie werden semigestructureerde interviews

uitgevoerd met drie projectleiders van teams die online wijkplatformen implementeerden; deze resultaten werden gebruikt als basis en input voor de conferentie. De projectleiders hadden vergelijkbare ervaringen met betrekking tot de belemmerende en bevorderende factoren in de implementatie van online wijkplatformen. Het bleek een uitdaging om commitment en medewerking te krijgen van de samenwerkende partners. Aanbevolen werd om co-creatie methoden te hanteren voor het identificeren en integreren van behoeften en wensen. Daarnaast werden uitdagingen gesignaleerd met betrekking tot het inbedden van online platformen in buurten of wijken, waarbij 'aansluiten' bij (het netwerk van) de beoogde doelgroep en aansluiten bij 'real-life' activiteiten, als primair werden aangeduid. Mede door de complexiteit van de implementatie was de aandacht van de implementatieteams te sterk gericht op het platform 'an sich', terwijl het eigenlijk een middel zou moeten zijn om (kwetsbare) thuiswonende ouderen te ondersteunen. De focus van platformen zou daarom moeten liggen op het aanbieden van offline diensten en ondersteuning. Ook werden belemmeringen ervaren ten aanzien van het gevoel van eigenaarschap en het verdienmodel; de verantwoordelijkheden van iedere betrokken samenwerkingspartner en de businesscase van het online wijkplatform waren niet uitgekristalliseerd. Tot slot werden uitdagingen genoemd met betrekking tot de digitale vaardigheden van thuiswonende ouderen. Een aanbeveling om deze barrière te overwinnen was dat de minder digitaal vaardige gebruiker een aanspreekpunt in de directe omgeving zou moeten hebben.

De algemene discussie in **hoofdstuk 7** biedt een reflectie op de belangrijkste resultaten van de uitgevoerde studies. Daarnaast komen enkele methodologische overwegingen aan bod met betrekking tot het actie-onderzoek, de betrokkenheid van thuiswonende ouderen en het meten van de impact van online wijkplatformen. Theoretische overwegingen inzake de toegevoegde waarde en impact van online wijkplatformen en de implementatie ervan worden ook besproken. Het hoofdstuk sluit af met implicaties voor beleid, praktijk en onderzoek.

Uit onze studies blijkt dat online wijkplatformen die gebruik maakten van de Cubigo software-infrastructuur nauwelijks werden geaccepteerd of geadopteerd door thuiswonende ouderen en het lijkt erop dat deze platformen een minimale of vrijwel geen impact hebben gehad op oud worden in de eigen omgeving en maatschappelijke participatie. Het is onduidelijk of deze uitkomsten anders zouden zijn geweest voor platformen die gebruik maakten van andere software-infrastructuren aangezien we deze niet hebben onderzocht. De ontwikkelingen lopen uiteen; sommige platformen laten de doelstelling los om thuiswonende ouderen te ondersteunen in maatschappelijke participatie, terwijl andere platformen de nadruk blijven leggen op deze insteek. Het is nog onzeker of men door moet gaan met het implementeren van



online wijkplatformen voor thuiswonende ouderen. Als ouderen echt ondersteuning willen en nodig hebben door te participeren in hun buurt of wijk, dan kunnen online platformen een waardevol middel zijn om hen te ondersteunen. Toekomstige initiatieven of organisaties die platformen willen implementeren worden geadviseerd om het implementatieproces intensief te ondersteunen. Bovendien zou verder onderzoek moeten uitgaan van modellen voor technologie-acceptatie die rekening houden met sociale, psychologische, gedrags- en contextuele factoren die specifiek verband houden met oud worden in de eigen omgeving.



## Impact paragraaf

De overgang van een verzorgingsstaat naar een participatiesamenleving heeft een aanzienlijke sociale impact op ouderen; wanneer een thuiswonende oudere behoefte heeft aan ondersteuning wordt er eerst gekeken naar het eigen sociale netwerk waarbij hulp 'zo dichtbij' mogelijk wordt georganiseerd. Buurten en wijken bezitten verschillende hulpbronnen die ouderen kunnen inzetten om langer thuiswonen beter mogelijk te maken. Deze hulpbronnen kunnen onder andere toegankelijk worden gemaakt via online wijkplatformen. Deze platformen hebben meerdere doelen, zoals het ondersteunen van maatschappelijke participatie en het stimuleren van onderlinge informele zorg en dienstverlening. Via deze online platformen kunnen wijkbewoners, zo ook thuiswonende ouderen, verschillende applicaties raadplegen. Een aantal voorbeelden daarvan zijn: een tool voor de uitwisseling van informele hulp, vaak 'vraag en aanbod' of 'elkaar helpen' genoemd en een lokale agenda waar informatie te vinden is over evenementen en activiteiten (zoals een koffie-uurtje of wandelgroep). Deze platformen worden gezien als een veelbelovend hulpmiddel en met name in Nederland zijn de afgelopen jaren veel van deze platformen ingevoerd. De kenmerken en evaluatie van online wijkplatformen stond centraal in deze dissertatie. In dit hoofdstuk wordt een beschrijving gegeven van de impact en relevantie van de onderzoeksresultaten.

## Onderzoek

De onderliggende dissertatie had als hoofddoel om online wijkplatformen voor thuiswonende ouderen te evalueren die waren ontwikkeld op basis van wensen en behoeften van eindgebruikers. De door ons geëvalueerde platformen maakten allemaal gebruik van de Cubigo software en waren gericht op het ondersteunen van maatschappelijke participatie om zo langer thuiswonen voor ouderen te faciliteren. Het gebruik, de ervaringen en de ervaren meerwaarde van deze platformen werd onderzocht. Het gebruik van de platformen was over het algemeen laag en er werd een afname in het gebruik geconstateerd in de loop van de tijd. Als platformen *wel* werden gebruikt dan waren de meest geraadpleegde applicaties geënt op communicatie (bv. berichten, contacten) of op informatievoorziening over de buurt of wijk (bv. community, foto's en video's). Aangezien het gebruik van de online wijkplatformen regelmatig uitbleef, werden de motieven van ouderen om platformen *niet* te gebruiken onderzocht. Belangrijke motieven om een online wijkplatform af te wijzen waren dat:

het platform werd beschouwd als een hulpmiddel dat "van buitenaf werd ontwikkeld" en dat gevoelens van eigenaarschap daardoor afwezig waren. Het platform werd daarnaast niet gezien als toegankelijk of gebruiksvriendelijk en de inhoud als ofwel verouderd ofwel als niet goed passend bij verwachtingen of behoeften. Tot slot bleek er een gebrek aan identificatie met de doelgroep van het platform te zijn (namelijk thuiswonende ouderen met een ondersteuningsbehoefte) en was er geen behoefte aan de hulpbronnen die het platform aanbod; bijvoorbeeld mogelijkheden tot uitbreiding van het sociale netwerk of mogelijkheden om meer maatschappelijk te participeren. Slechts een kleine minderheid van de deelnemende thuiswonende ouderen gaf aan dat het platform een toegevoegde waarde voor hen had. Bovendien was de ervaren meerwaarde van het platform significant lager dan de initiële verwachtingen die thuiswonende ouderen hadden: zij hadden de verwachting dat het platform hen zou kunnen ondersteunen bij het inschakelen van zorg- en welzijnsdiensten, het inschakelen van buurt-of wijkgenoten (vragen om hulp) en het aanbieden van hulp aan buurt-of wijkgenoten. Deze verwachtingen kwamen niet uit. Daarnaast bleek gedurende onze studies dat ook andere implementatieteams in Nederland (die gebruik maakte van verschillende software) barrières ervoeren bij de implementatie van hun online wijkplatform en dat het een grote uitdaging was om thuiswonende ouderen te bereiken en te stimuleren om gebruik te (blijven) maken van hun platformen.

De hierboven beschreven onderzoeksresultaten laten zien dat online wijkplatformen in de vorm zoals door ons geëvalueerd (namelijk platformen die gebruik maakte van de Cubigo software) niet gemakkelijk werden geaccepteerd of gebruikt door thuiswonende ouderen. We kunnen echter nog niet bepalen of we al dan niet door moeten gaan met het invoeren van online wijkplatformen. Als thuiswonende ouderen daadwerkelijk ondersteuning willen en nodig hebben om thuis ouder te worden door middel van maatschappelijke participatie, dan zouden online wijkplatformen wel eens een waardevol hulpmiddel kunnen zijn. Toekomstige initiatieven of organisaties die platformen willen implementeren worden aangeraden om het implementatieproces intensief te ondersteunen. Bovendien wordt aanbevolen dat verder onderzoek naar online wijkplatformen gebruik maakt van modellen voor technologie-acceptatie die rekening houden met factoren die specifiek gerelateerd zijn aan thuiswonende ouderen.

## Relevantie

De resultaten van deze dissertatie dragen bij aan de wetenschappelijke kennis over de ervaren meerwaarde van online wijkplatformen en over het feitelijk gebruik ervan nadat deze zijn geïmplementeerd. Bovendien is ook diepgaand onderzocht welke motieven thuiswonende ouderen hebben om online wijkplatformen *niet* te gebruiken. Er is tot op heden weinig onderzoek gedaan naar de factoren die een rol spelen bij het (niet-)voortgezette gebruik van technologie nadat deze is geïmplementeerd; de meeste studies richten zich op de fase vóór de implementatie. Daarnaast is er weinig onderzoek gedaan naar het gebruik van technologie door ouderen die rekening houdt met sociale, psychologische, gedrags- en contextuele factoren specifiek gerelateerd aan het *thuis* ouder worden. In dit proefschrift is er daarentegen wel veel aandacht voor deze contexten en beïnvloedende factoren.

Naast de wetenschappelijke relevantie dragen de resultaten van deze dissertatie ook bij aan maatschappelijke vraagstukken die ontstaan door de transities in het zorg- en welzijnsdomein. De verantwoordelijkheid voor zorg en welzijn komt meer bij de burger te liggen. Alleen voor wie niet meer zelfredzaam kan zijn wordt er door gemeenten en zorg- en welzijnsorganisaties op participatie gerichte ondersteuning of passende zorg geboden door middel van algemene voorzieningen of maatwerk-voorzieningen. Een online wijkplatform is een voorbeeld van een maatschappelijke voorziening welke vrij toegankelijk en bedoeld is om de zelfredzaamheid en maatschappelijke participatie van thuiswonende ouderen te versterken door lokale hulpbronnen aan hen beschikbaar te stellen. De resultaten van deze dissertatie dragen bij aan de verkenning, ontwikkeling en bijsturing van online interventies die in wijken worden ingezet om ouderen te faciliteren in het langer thuiswonen. In het bijzonder ten tijde van een pandemie, waarin we allen meer genooddaakt zijn om met elkaar te interacteren via online hulpmiddelen, is een verkenning van dergelijke online interventies van grote meerwaarde. Bovendien wordt de wetenschappelijke onderbouwing en impact van online interventies steeds belangrijker gevonden: er wordt naar bewijs gezocht om aan te tonen of deze interventies wel de uitkomsten behalen die ze beogen. De resultaten van deze dissertatie bieden geleerde lessen over hoe ouderen al dan niet ondersteund kunnen worden om langer thuis te blijven wonen met behulp van technologie.

## Doelgroepen en activiteiten

De onderzoeksresultaten van deze dissertatie zijn relevant voor thuiswonende ouderen, burgerinitiatieven, zorg- en welzijnsorganisaties, gemeenten, platformontwikkelaars en teams die platformen implementeren. Al deze doelgroepen vervullen verschillende rollen inzake (de implementatie van) online wijkplatformen; zij zijn afwisselend gebruiker, aanbieder of aanjager. Laatstgenoemde rol omvat het implementeren van platformen en het daaraan gerelateerde 'kwartiermaken'. In deze dissertatie staat het perspectief van thuiswonende ouderen ten aanzien van online wijkplatformen centraal. Verschillende ervaringen met deze platformen zijn in kaart gebracht en de wijze waarop en onder welke randvoorwaarden thuiswonende ouderen al dan niet gebruik willen maken van online wijkplatformen zijn inzichtelijk gemaakt. Hierdoor levert deze dissertatie vanuit het perspectief van thuiswonende ouderen relevante inzichten op voor de genoemde doelgroepen als collectief: een reëler beeld is ontstaan van wat thuiswonende ouderen wenselijk vinden ten aanzien van online wijkplatformen. Zowel gebruikers, aanbieders als aanjagers hebben nu beter inzichtelijk wat wenselijk en mogelijk is voor thuiswonende ouderen.

De onderzoeksresultaten uit deze dissertatie hebben geleid tot belangrijke aanbevelingen en randvoorwaarden voor het ontwikkelen en implementeren van online wijkplatformen: deze zijn reeds van meet af aan op verschillende manieren gedeeld met de betrokken doelgroepen. Zo zijn thuiswonende ouderen via actieonderzoek actief betrokken bij onze studies en zijn geleerde lessen direct naar hen voortgevloeid. Tevens zijn er met verschillende gemeentes, zorg- en welzijnsorganisaties en burgerinitiatieven adviesgesprekken gevoerd en zijn zij via presentaties en een conferentie geïnformeerd over de geleerde lessen. Op die wijze konden laatgenoemden redelijk evidence based te werk gaan in hun implementatie. Ofwel, de onderzoeksresultaten uit deze dissertatie vonden direct een weg naar degenen die in de praktijk zich bezighielden met de ontwikkeling en implementatie van online platformen.







## Dankwoord

Gedurende mijn jaren als promovendus dacht ik regelmatig dat het schrijven van mijn dankwoord nog mijlenver van me verwijderd was. Toch is het nu zover. Voor mij is het een emotioneel en trots moment om als laatste hoofdstuk dit dankwoord te mogen schrijven.

Erik, gedurende het promotietraject was jij mijn primaire aanspreekpunt en mentor. De ‘functie’ van dagelijks begeleider heb je meer dan eervol vervuld. Ik heb ervaren dat ik bij vragen of besprekpunten jou altijd kon bellen, appen of e-mailen. Voor mij was jij een enorm toegankelijke copromotor die een omgeving creëerde waarin ik mijzelf vrij kon ontwikkelen en mocht leren. Jouw gedetailleerde feedback op de artikelen was daarnaast van enorme meerwaarde; door jou heb ik leren schrijven. Dankjewel!

Marieke, begonnen als mijn copromotor en nu voor de eerste keer promotor. Voor mij is het een eer dat ik jouw ‘eerste’ promovendi mag zijn! Onze ontmoetingen, vaak in de vorm van een korte wandeling, die zowel over de ‘inhoud’ gingen als van vriendschappelijke aard waren, heb ik als heel fijn ervaren. Jouw ongezouten mening en de wijze waarop je jouw leven leidt, voelt op de een of andere manier als thuis. Daarnaast gaf je mij veel erkenning over het feit dat een promotietraject ook op persoonlijk vlak een enorme uitdaging kan zijn. Voor deze bijzondere bijdrage ben ik jou dankbaar.

Luc, ik bedank jou voor het creëren van de kans om te promoveren. Ondanks dat ik niet de ‘standaard’ PhD-kandidaat was, vond jij dat het aangaan van een promotietraject binnen mijn mogelijkheden lag. En daarom creëerde *jij* die mogelijkheid. In mijn functie als jouw ‘personal assistant’ heb ik allerlei lagen van de academische wereld leren kennen alvorens ik aan een promotietraject startte, ook dit heb ik als enorm waardevol ervaren. Tijdens de promotie-overleggen was de door jou veelvuldig gegeven feedback: ‘gewoon doen’ en ‘gewoon nog even afmaken’. Hoewel soms lastig om te horen spoorde dit mij aan om het schrijf-tempo te verhogen. Naast deze promotor-skills ben ik jou vooral dankbaar voor de vele gesprekken die wij voerden over allerlei facetten van het leven. Je gaat en denkt buiten gebaande wegen en dat kan ik waarderen!

De leden van de beoordelingscommissie, Prof. dr. R.M.M. Crutzen, dr. J.C. Keinemans, Prof. dr. F.D. Mahr, Prof. dr. E. Wouters en Prof. dr. S.M.G. Zwakhalen, wil ik bedanken voor het lezen en beoordelen van mijn proefschrift.

Het actie-onderzoek zoals door mij uitgevoerd was nooit mogelijk geweest zonder de medewerking en inbreng van 'real-life settings' en de mensen die daartoe behoren. In het bijzonder gaat mijn dank uit naar de dames en heren van Stichting Buurtbeheer Molenberg, de buurtbewoners die frequent de Brede Maatschappelijke Voorziening in Molenberg bezochten, de leden van de 'Mijn-Molenberg' werkgroep en de professionals die in Molenberg actief waren. In het bijzonder wil ik bedanken: Frank Peters, Harry van der Heijden, Finy Kockelkorn, Ton Otten, Hub Eggen, Hub Siemers, Mia Dirks, Jos Benders, Patrick Jansen, Jan de Liège, Wouter Wijers, Alex Mans, Rob Heunen, Eri Dritty, Anita Eijer, Ingrid Neven en Ger Boeke.

De bewoners en professionals die actief waren in Welten-Benzenrade wil ik ook graag bedanken voor hun bereidheid om mee te denken over 'Mijn Welten-Benzenrade'. Veel dank aan Jacqueline Bosch, Jan Gielens, André Jacobs en Anton ten Westenend.

Peter Jacobs, John Rietman, Willemien van Gardingen, Ruud Meijers, Mieke Cruisberg en Kees Cligge. Het was altijd fijn om naar Grubbenvorst te mogen reizen (toentertijd nog lekker dicht bij huis) om deel te nemen aan de project-overleggen van 'Meedoen in Grubbenvorst'. Mooi om te zien hoe jullie allen vanuit eigen perspectief de inwoners van Grubbenvorst ondersteunen. Bedankt voor jullie facilitering en steun inzake het onderzoek naar Grubbenvorst-Online!

Ook de leden van de Senioren Vereniging Heerlen hebben op verschillende manieren meegedacht en toegang geboden tot hun netwerk. Dank daarvoor!

Cynthia Smeets, bedankt voor jouw werk als community-manager dat je met enthousiasme en gedrevenheid uitvoerde. De wijze waarop jij laagdrempelig met allerlei stakeholders interacteerden bracht de implementatie van online wijkplatformen in beweging.

Ook veel dank aan Gemeente Heerlen die heeft bijgedragen aan het onderzoek naar online wijkplatformen, onder andere in de vorm van een innovatiefonds. Hartelijk dank aan Peter van Zutphen, Adriane Keulen, Manon Souren, Gladys Tummers, Armand Vanhommerig, Eline Verstegen, Hans te Locke en Karin van Meelis.

Hartelijk dank aan de bestuursleden van Zorgtafel Heerlen en de projectleden van Proeftuin Heerlen. Graag spreek ik mijn dank uit aan Bert Hesdahl, Cindy Caanen, Marianne Potting en Nicole van den Ham.

De vele kwartiermakers die intensief hebben gewerkt aan de ontwikkeling en implementatie van online wijkplatformen in Nederland. Hartelijk dank aan Simone Poell, Annette van Raaij, Sylvia Vranken, Wil Philipsen, Eric Hendriks en Berny de Vries voor het delen van geleerde lessen!

Het was niet mogelijk geweest om de ervaringen met het online wijkplatform te onderzoeken zonder de steun en medewerking van Cubigo zelf. In het bijzonder wil ik de oprichters van Cubigo bedanken; Peter Willems en Geert Houben. Ook hartelijk dank aan Laura de Bock, Peter Vrancken en Edward Jenner die als directe aanspreekpunten meedachten over technische aanpassingen en mogelijkheden.

Mijn dank gaat ook uit naar de studenten die in verschillende rollen (als afstudeerder, werkstudent of stagiair) hebben meegewerkt in de projecten over online wijkplatformen, veel dank aan: Yasmine Bruinsma, Richelle Hoes, Sander Baltus, Tessa Janssens, Judith Hermans, Neeltje Prick, Charlotte Theunissen en Marijn van Dolderen.

Aan de collega's van de lectoraten Wijkgerichte Zorg, Sociale Integratie en de Academie voor Sociaal Werk. Bedankt voor de samenwerking in het verleden en alvast voor in de toekomst. Aan Olaf, Jhoy, Vivianne, Fabienne, Jérôme, Pieter, Babbe, Chretien, Peggy, Matthias, Leo en Tiets: bedankt voor het meedenken, omdenken, anders-denken en gelijk-denken!

Aan de (ex)ZAPPIES: Marja, Bea, Jacqueline, April, Ger, Yan-Ping, Charles, Lianne, Cynthia, Sandra, Uta, Claire, Edith, Jeanne, Esther, Monique, Renée V, René C, Paulette, Ramon, Karin en Nena. Bedankt, voor de leerzame tijd op ZAP, voor het gegeven dat ik altijd bij het 'team' mocht blijven ondanks dat ik er eigenlijk niet meer bij hoorde en uiteraard voornamelijk bedankt voor alle leuke lunch-wandelingen, team-uitjes en borrels. Op 'kantoor' werken is zowaar leuk door jullie aanwezigheid!

Renée van den Heuvel, Laura Hochstenbach en Loek van der Heide. In het bijzonder ben ik jullie dankbaar voor het feit dat ik me bij jullie vrij voelde om (wellicht hele groene) vragen te stellen over PhD-gerelateerde kwesties. Dank voor jullie hulp! PS. Ook bedankt voor het simpelweg fijne samenzijn.

Nadine Spierts. Die wandeling door Eys loop ik nog steeds. Dankjewel voor wie jij bent.

Joan Vermeulen. Mede doordat je mij hebt betrokken als junior onderzoeker bij jouw promotieonderzoek ben ik gaan promoveren. Dankjewel!

Evelien Jagtman en Tiny Wouters. Bedankt! Zonder jullie creatieve werk had dit proefschrift er nooit zo mooi uitgezien.

Lieve vrienden, lieve Daan, Wendy, Helen, Tonny, Sjan, Linda en Marloes. We zien elkaar niet vaak. Jullie zijn me echter heel dierbaar. Bedankt voor jullie voortdurende vriendschap en steun.

Jill en Miranda. Het leven kan raar lopen. Daar weten wij alles van. Oprecht dankbaar ben ik voor jullie in mijn leven, voor Senn en Mick, voor jullie steun, voor de gezellige lunches en diners, voor de play-dates tussen Sennie en Nore en voor het delen van ervaringen en herinneringen.

Anne. "Als ik jou zie dan.." word ik altijd vrolijk. Zo ook van het liedje van Clouseau (Anne), dat me op de een of andere manier altijd aan jou doet denken. Aaliyah, Lenny Kravitz, Bray-Dunes, muziek maken, woestijnratten en zolderkamers in Venlo-Zuid. Een vriendschap die allerlei 'fases' heeft doorlopen. Dankjewel dat je me meevroeg ongeveer 20 jaar geleden. En dankjewel dat jij 'ja' zei op mijn vraag of je mijn paranimf wilde zijn.

Eva, lieve Eef. Wat ben jij mij dierbaar. Mijn zusje. De enige die ook heeft ervaren hoe het was om als kind op te groeien op de Tegelseweg tussen de vitrinekasten propvol met antiek en te midden van ontelbare schilderijen. Het idee voor de kaft van dit proefschrift komt mede voort uit jouw creativiteit en ons leven. Hebben die schaaklessen toch nog wat opgeleverd! Dankjewel voor jouw vrolijkheid, kritische blik, onvoorwaardelijke liefde, warme omhelzing en oprechte interesse. Dankjewel voor jouw aanwezigheid in Nore's leven (Best Aunty Ever!). Dankjewel dat je ook bij dit life-event als paranimf aanwezig bent. PS. Dankjewel, Ami, dat jij ook ziet hoe bijzonder Eva is.

Pap. Bedankt voor jouw aandeel aan wie ik ben geworden als mens. Door jouw intense bezieling voor schrijven, kunst, antiek en cultuur is ook mijn leven mooier.

Mam. Bedankt voor alle momenten van steun en voor de vele 'yes-you-cans'. Zonder jouw vertrouwen en aansporen had dit proefschrift er waarschijnlijk niet gelegen. Het was niet altijd gemakkelijk voor jou. Dankjewel dat je doorzette, vocht, bleef en er was. Dat je een bepaalde toekomst en deze mijlpaal mogelijk maakte. En dankjewel dat je er altijd was voor Nore. PS. Dankjewel, Ab, dat jij ook ziet hoe bijzonder mam is. En dat je er ook was voor mij, Eva en Nore.

Lieve. Ayden. Jouw oprechte aandacht en steun waren onmisbaar. Dankjewel dat je er was. Dat je meerdere dagen en avonden zonder mij hebt doorgebracht omdat ik moest schrijven. Buiten dankbaarheid voor die steun ben ik je vooral dankbaar voor wie jij bent en dat je jouw leven met mij deelt (inclusief: ochtendhumeur, nachtelijk bakken, poëzie, rechtsvaardigheids-gevoel en beren-gadgets). Dankjewel voor jouw non-conformisme, jouw warmte en ons gezamenlijke anders-denken. Zo heb ik je ontmoet en wil ik je blijven ontmoeten.

Lief. Lieke. *"I still ended up exactly where I was trying to go"*... Jij structureerde mijn gedachten en bleef naast me staan als ik het even niet meer zag zitten. Dankjewel voor jouw enthousiasme en bemoediging telkens als ik weer een stap verder zette richting de afronding van mijn proefschrift. Boven alles, ben ik dankbaar voor jouw liefde en kwetsbaarheid. Voor alles dat bij jou hoort. Je verrijkt mijn leven. Ik denk meestal aan jou en daarmee onder andere aan: wandelen om 6 uur in de ochtend (why?!), haverhout, buitenbioscoop, zoete aardappel, struikelen over lucht en boeken zonder kleur.

Allerliefste Nore. Jij bent het beste wat mij ooit is overkomen. Jouw 'zijn' leert mij om stil te staan en het leven simpelweg te ervaren zoals het is. Mijn dag begint volmaakt als ik je 's ochtends vroeg ontmoet met je warrige rode haartjes en slaperige blauwe ogen. Ik ben trots op *alles* van jou, trots om jouw mama te zijn, trots op jouw onbevangenheid naar iedereen die je ontmoet, trots op jouw veerkracht en moed. Jouw nieuwsgierigheid en vreugde inspireren mij. Lieve Nore, er is geen tijd om te haasten. Dat leer jij mij. Hopelijk mag ik jou hetzelfde leren.



## About the author

Sarah Willard was born in Venlo, the Netherlands (1987). After completing her secondary education in 2004 she started her professional education in social work at Zuyd University of Applied Sciences (Zuyd Hogeschool). After graduation in 2009 she started with the premaster and master program of Sociology at the University of Amsterdam (graduation in 2012). Within this master's programme Sarah focused in particular on the themes citizenship, healthcare policy, social work and education sciences.



Sarah started working as a junior researcher via the traineeship Jump Start at Zuyd University of Applied Sciences, research Centre for Technology in Care in 2013. After working in various projects for almost 2 years, she got the opportunity to start as a PhD student. Her project focused on the evaluation of online community care platforms for older adults to support civic participation and ageing-in-place. During her PhD, Sarah was involved in educational activities at various Zuyd academies, i.e.: Social Work, Nursing, Occupational Therapy and Physiotherapy. From 2020 onwards, Sarah works as a researcher for 2 days a week for the Research Centre for Community Care, with a particular focus on the development and evaluation of community-based living labs. Sarah will continue to work within various projects for Zuyd University at the interface of the health and social domain.





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