



D5.4 Impact testing and validation report

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Document Information

Purpose of document

This deliverable (D5.4) describes the testing of the Palette platform and the Alpha and Beta validation and evaluation of the system and the services developed. It describes the iterative development process of the platform, in which end-users have used the platform for one month during the Alpha and two to three months during the Beta. The Alpha and Beta evaluations were held in Switzerland, Romania, Poland and The Netherlands with in total 101 end-users. In this document we will describe – among others – the user acceptance, accessibility, technology acceptance, desirability, self-efficacy, social connectedness from the contents point of view, user-friendly aspects, flexibility, and the capability of Palette to be transferred to other environments and cultures.

Organisation Responsible

Vilans is the organization responsible for this deliverable. KempenLife and Smart Homes are contributors and reviewers of the document.

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Project Summary

Background

Project PaletteV2 focuses on advancing the quality of life of seniors in our society. One of the main goals is to provide them the opportunity to actively participate in a range of social processes and developments. PaletteV2 wants to achieve this by providing them a user-friendly online platform that - through digital contact - gives them access to likeminded people and activities that are aligned with their interests.

Purpose of PaletteV2

Palette helps older adults around their pension age to find activities and likeminded people in their local environment, to enable them to lead a fulfilling life and decrease the chance of loneliness. Reaching retirement age is one of the biggest changes in life, in which questions rise about having a meaningful day, making sense, and preventing loneliness. Today, 6 per cent of Europeans admit they have no one to talk to about their problems. There are about 44 million lonely people across Europe. Loneliness is bound to occur more often amongst persons who are single, widowed, have a migration background, have a lower economic status, and who are disabled. According to the Dutch National Institute for Public Health and the Environment (2019) around 10% of the 75-84 year olds and about 15% of the people older than 85 years old experience severe loneliness. There are various reasons that might explain why this number increases as people grow older. In the Netherlands, 33% of 75-79 years old live alone, compared to 73% of the people older than 90. In addition, in Dutch rural areas the average distance of 80+ older adults to their children (who are potential informal caregivers and social contacts) exceeds 30 kilometres. To avoid loneliness, close supportive relationships are required¹. Research commissioned by the Dutch Ministry of Health showed that older people who receive care value - among others - a meaningful day as of the most important aspects of their life². A meaningful day is a day in which an activity is planned, a day in which you can have a social connection to someone, a day with play, a laugh or joyful moment. In the lives of most people their active contribution to society has been a satisfying and motivating experience until retirement. For many years, their work was simply nice to do and a social meeting place at the same time. There is no difference between men or women at this point. Whether one is involved in production and services for far away customers and clients or in housekeeping and catering for the family, the reward is more or less the same: we are valued for what we do, no matter if our contribution to the community is large or small.

The idea for Palette gradually developed during focus groups (see WP3) that focused on understanding daily life of people that are around their retirement age and how technology already shapes their lives; which services are already used, what problems they encounter, which services or aspects are missed, etc.

¹ Dahlberg, L., Andersson, L., & Lennartsson, C. (2018). Long-term predictors of loneliness in old age: Results of a 20-year national study. *Aging & Mental Health*, 22(2): 190-196. DOI: 10.1080/13607863.2016.1247425.

² Gijzel, H., Nap, H.H., Herps, M., Mulder, S., Van Klink, M., Schrijers-Snoeijs, S., Kuperus, K., & Minkman, M. (2017). *De Wet langdurige zorg in de verzorging, verpleging en gehandicapenzorg. Ervaringen uit de praktijk*. Amstelveen: KPMG/Vilans.



The Palette motto: "Enjoy life together"

Palette helps users to have an easier and more joyful life. Retirement is no longer a barrier to have a good time with people in their neighbourhood. Research has shown again and again that taking part in community life helps people to stay healthy and happy. After 65, we may live 20-25 years or more. There are so many things to do in all those years. Palette provides a platform to find these things and enjoy time with others.

Within the PaletteV2 project, we built an online service environment, an easy to use platform that assists older adults in staying active participants in society. Based on dedicated, specified profiles, the Palette platform brings people and activities together. Many facets of society are digitizing and are taking place in the online world; many daily interactions are increasingly mediated by technologies. However, seniors' confidence in interacting with computers has a role in stress during computer interaction, advocating the need for a user-friendly system that gives older adults access to digitalized services. Unique is its adaptiveness to the ICT skills of the end-user, in order to reduce discomfort with the digital services. This was ensured amongst others through the continuous involvement of the target group during the co-design, testing and validation.

The iterative Alpha and Beta process

The development of Palette was an iterative process, in which the target group was involved in every phase. In the image below, the cycli of the user centered design process are depicted. The cycli are depicted sequentially as: focus groups, co-creation sessions, mock-up testing, pre-Alpha, Alpha and Beta testing.

With each new cycle, feedback received from the end-users was translated into a new set of requirements which are then integrated and built into the platform by the technical development partners (WP4).

A working platform was developed based on the iterations up until the pre-Alpha test and the heuristic evaluation. This version of Palette is evaluated during Alpha and Beta testing. During the Alpha and Beta test phase, researchers also continually collected feedback from the participants on – among others - usability, technology acceptance, social connectedness and desirability, so improvements and new deployments were made by the technical partners.

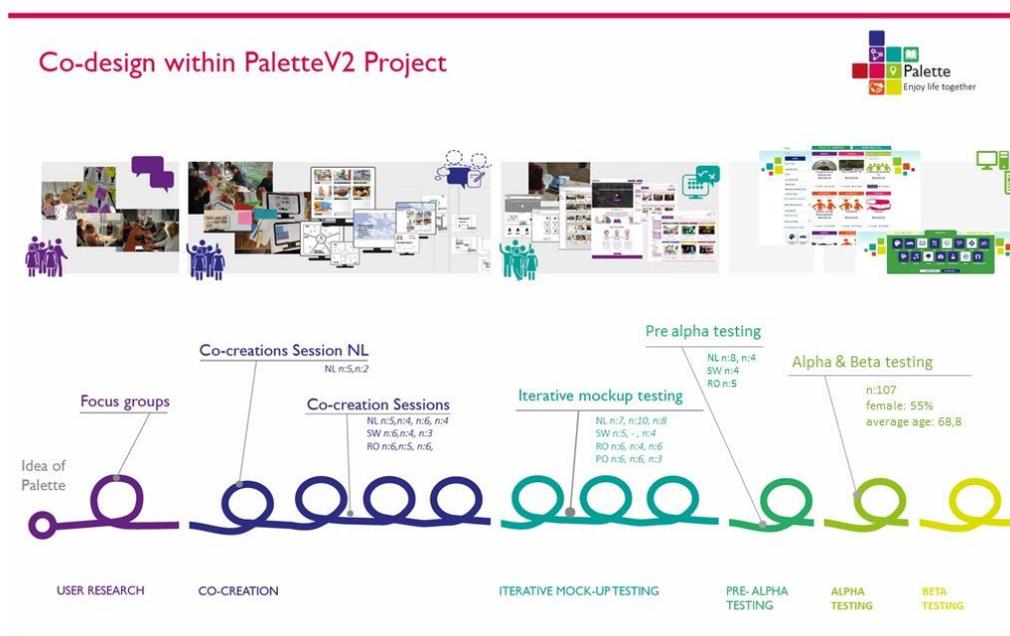


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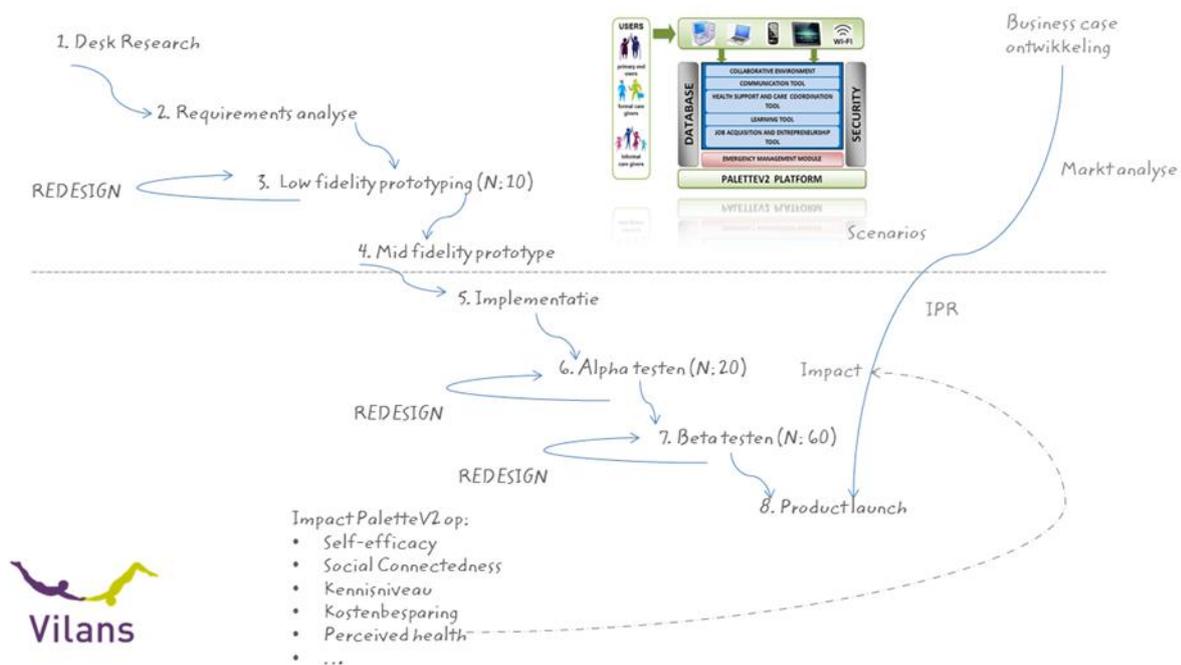


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1. Introduction

Work package 5 focused on testing, validation and evaluation of the Palette system and services developed, from Alpha to Beta in situ in four countries (Switzerland, Romania, Poland and The Netherlands) with a total of 101 end-users in Alpha and Beta and 197 end-users in total throughout the iterative design phases (while we planned a total of 60 for Beta, see below). After the phase of co-design, mock-up testing and a final heuristic evaluation, the Palette platform could be evaluated in Alpha and Beta testing. All specifications and functions were evaluated, refined and improved in a realistic user environment (see figure below for the co-creation and evaluation phases within Palette with a schematic overview of the planning for the Alpha and Beta testing).



The preliminary User Interface (UI) of Palette was designed first by using existing requirements for accessibility of – among others – Echt³ and Nap⁴, see also Deliverable 5.3. Furthermore, it is known that the effects of aging have an influence on how well people use existing technologies as well how they learn to use new technologies (see Charness & Holley⁵; Morrell et al.⁶; Xie⁷). To assure the success of any product, it is vital to evaluate the product with a range of potential end-users before it is released to market. Usability tests provide a rich and

³ Echt, K. V. (2002). Designing webbased health information of older adults: Visual considerations and design directives. *Older adults, health information, and the world wide web*. Mahwah, NJ: Lawrence Erlbaum Associates, 61, 87.

⁴ Nap, H. H. (2008). *Stress in senior computer interaction*. Eindhoven University of Technology.

⁵ Charness, N., Holley, P. (2004). The new media and older adults: Usable and useful. *American Behavioral Scientist*, 48, 416-433.

⁶ Morrell, R.W. (Ed.). (2002). *Older Adults, Health Information and the World Wide Web*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

⁷ Xie, B. (2002). Older adults, computers and the Internet: Future directions. *Gerontechnology*, 2, 289-305



large amount of input for improvements of the design of the system's UI and input modalities. In Palette, agile iterative user-centered design took place in which the interface was iteratively developed from low-fidelity paper prototypes to a high-fidelity prototype.

A main focus in Palette from low-fidelity to Beta testing, was on the usability and accessibility of the platform, which we also tested by means of expert heuristic evaluations⁸ that were planned in the first phases of the project and observational research during the sprints. Formal usability tests are an excellent tool to evaluate whether users can complete tasks and to detect where usability problems are situated in respect to e.g. provided feedback, efficiency, satisfaction, consistency, and memory overload. However, usability analyses are not as effective for measuring intangible aspects of the user experience such as fun and enjoyment or whether the product is desirable enough to purchase and the willingness to pay for the product. Therefore, the Palette global research design had an additional focus on outcomes as 'desirability' and 'willingness to pay'.

Goals

Purpose of this study was to evaluate the Palette platform by testing it in situ. This means that participants were invited to use the platform at home and to evaluate it in focus groups (Alpha) and by filling in questionnaires (Alpha and Beta). To evaluate the impact of Palette, we collected information about: the background of participants; the system data, the user acceptance, willingness to use, perceived usability, preferences and errors; the accessibility of the user interface (UI); desirability; technology acceptance; self-efficacy; social connectedness and willingness to pay.

Research Questions

The following research questions were central in the iterative user-centered design trials, Alpha testing and Beta testing to gather an insight in the usability, desirability, and willingness to pay.

- How useful is the product for the users so that it can support their social network, efficiently and effectively organize events and serve as a learning tool? (System Usefulness)
- To which extent is the information (content) provided by the product understandable as such that it supports performing tasks? (Information Quality)
- To which extent is the interface satisfactory for the end-users to perform tasks? (Interface Quality)
- To which extent is the product perceived as desirable by end-users? (Desirability)
- To which extent are end-users able to learn to use the product within a certain/reasonable time period? (Learnability)
- What are the financial boundaries – from a minimum to a maximum amount – that end-users are willing to pay for the product within a certain time period (Willingness To Pay - WTP).

End-users have participated in the Alpha by joining two focus groups, testing the platform at home for one month and filling in two questionnaires. During Beta testing end-users were asked to use the platform at home for four months, without having meetings. At three points during the Beta test participants were asked to fill in questionnaires.

In what follows, we first explain in the method section what the design and procedure of the Alpha and Beta test was. In that section we also give some more insights in the participants and the measurements and materials used.

⁸ Nielsen, J. (1995). How to conduct a heuristic evaluation. *Nielsen Norman Group*, 1, 1-8.



2. Method

2.1 Participants

In total, 197 end-users were involved in the various sprints and iterative design cycles. The usability, desirability, and willingness to pay of the high-fidelity Palette was tested in the Alpha with 33 and in the Beta with the 74 end-users ($N = 101$).

The Palette platform was tested by seniors in four different countries: The Netherlands, Switzerland, Romania and Poland. In the table below is shown how many seniors participated in Alpha and Beta in each of the countries. These numbers are based on the amount of people that were present at focus groups and/or filled in questionnaires.

Table 2.1 Number of participants in the Alpha and Beta studies by country and evaluation phase (T1-T3).

	Alpha						Beta								
	T1			T2			T1			T2			T3		
	N	Gender (Female)	Age (M)	N	Gender (Female)	Age (M)	N	Gender (Female)	Age (M)	N	Gender (Female)	Age (M)	N	Gender (Female)	Age (M)
Switzerland	5	5	65,8	5	5	65,8	7	4	70,7	4	3	67,3	3	2	69
Romania	7	?	?	7	?	?	20	13	66,7				4	2	67,8
Poland	8	5	66,6	6	3	65,5	6	3	67,2						
Netherlands	13	5	68,3	5	2	66,1	41	20	70,4				10	5	69,44
Total	33	?	?	23	?	?	74	40	69,2	4	3	67,3	17	9	69

The technology experience of the participants in Alpha and Beta varied from low (score 1) to high (score 5), with a mean score of 3.5. In particular, the seniors that participated in Romania (2,4) and Poland (2,8) had relatively lower scores on technology experience compared to Switzerland (3,8) and The Netherlands (3,3).

Most of the end-users were retired and almost one third of the participants were working voluntarily, some of them combined with paid work and some of them combined with the search for a job. A small part was still working in a paid job. The figure below shows the education level of a group of participants during Beta, which shows us that most of the end-users that participated in these tests were highly educated people. In every country the education system is slightly different, but the values between the two extremes (Elementary school/PHD) are not explicated for now.





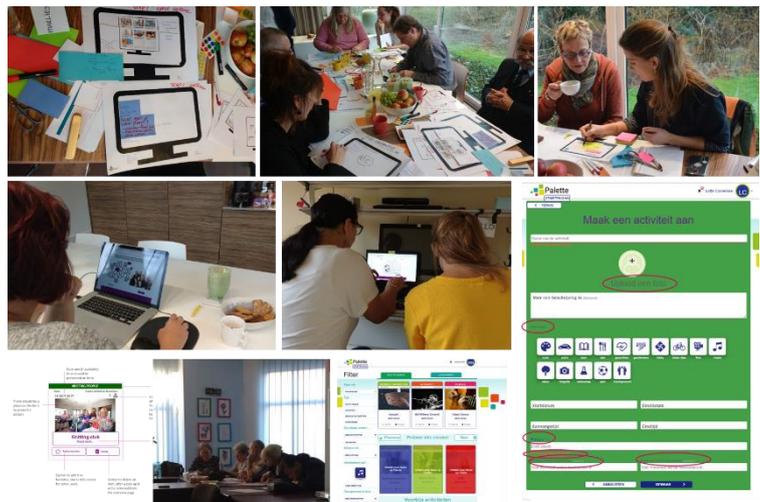
Figure 2.1 Education of end-users

2.2 Researchers

A group of four researchers set up the questionnaires and guidelines. Two researchers analysed and reported the data of the questionnaires. In each country, two researchers were always present during the Alpha and Beta sessions. One was introducing and supporting the participants, while the other was making notes and ensuring the data collection.

2.3 Design and procedure

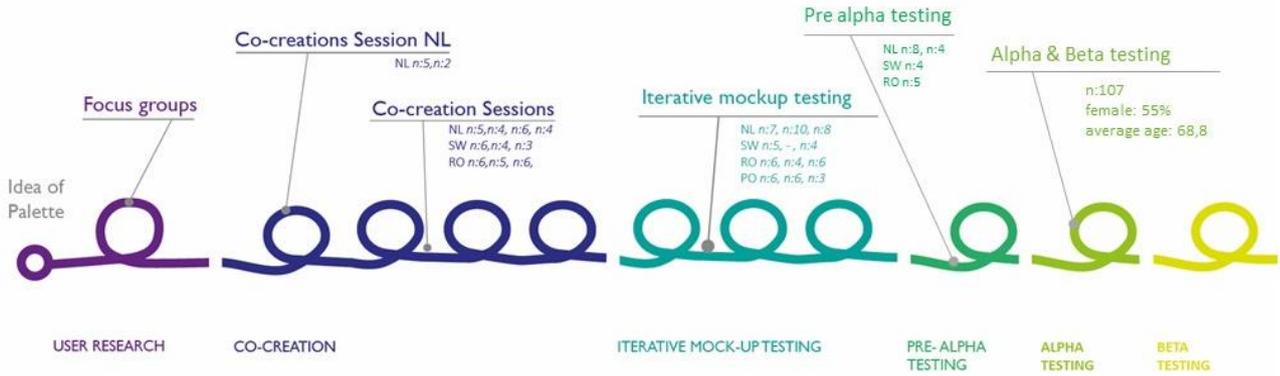
In this paragraph we describe the design and procedure of the user evaluation through Alpha and Beta testing. The co-design phases in Palette were iterative in which end-users were involved continuously throughout the whole process. In focus groups the first ideas for the Palette platform grew (see WP3). In co-creation sessions end-users actively participated in the design process of the platform. During the phase of iterative mock-up testing multiple iterations were made, so that at the beginning of the pre-Alpha, a partially working prototype could be tested.



Based on the findings in that phase several iterations were made in which the Palette platform became increasingly more compatible with the end-users' needs, abilities and ontology (i.e., the concepts used in the platform). Functionalities were added to the platform in the pre-alpha testing, such as: Try palette, View participants of an event, How others see your profile, Delete your profile, Contact moderator/palette team and other functionalities also removed in consensus with the end-users. After the iterative mock-up testing, a fully functioning platform was developed that could be tested in Alpha and later on in Beta.

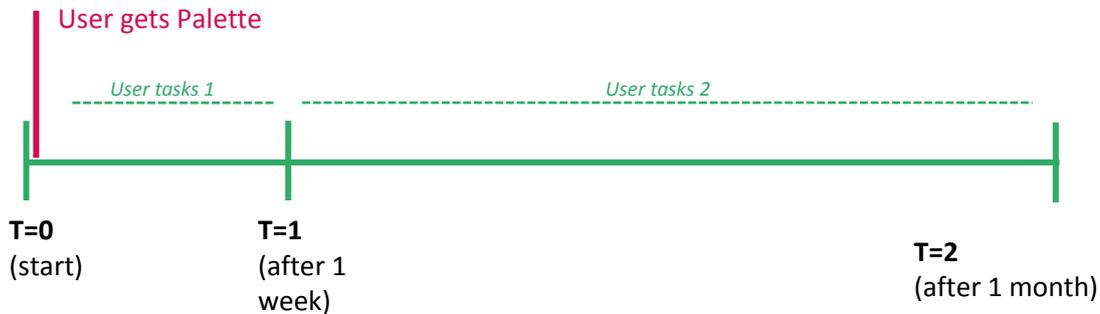


Co-design within PaletteV2 Project



5.2.1 Alpha

A guideline for Alpha testing was developed and spread among all partners (for all details of the procedure and the guideline, see appendix A or Deliverable 5.2). The design of the Alpha test was as follows:



	Method	Measurements	When
T=0	Focus group	General Questionnaire Topic: Expectations about the platform	Week 34: 20 -24 Aug
T=1	Online questionnaire	IBM UTAUT2 Desirability	T=0 + 1 week (week 35: 27-31 Aug)
T=2	Online questionnaire	IBM UTAUT2 Desirability	T=0 + 4 weeks (week 38: 17-21 Sept)
	Focus group	Topic: experiences with the platform	

Procedure

First, we describe the procedure from the Netherlands, because the guideline was developed there, and then we will highlight the differences in the various countries.

T=0 Focus group 1

A focus group was organized for all participants. In the Netherlands, that meant that the end-users participated in one the three focus groups organized. The goal of this particular focus group was to give an introduction to the platform and collect information about the expectations. 5-8 people participated in a focus group. Participants were welcomed and offered something to drink and have a sweet snack. The project and the platform was introduced in a short presentation. Then participants were asked to sign the informed consent form to give permission to use data for research. They were informed that the results are pseudonymized, that participation is not compensatory and that they can decide to stop anytime without providing reasons why. Then the general questionnaire was given to them to collect the participants' characteristics (such as age, gender, retirement, level of education and computer experience) and some first expectations of the platform. Next, a focus group discussion took place around the following topics: expectations from the platform; the kind of items that would be nice to attend, how many times they expected to use the platform and for what situations; at which moments they would use palette. Flip charts and post-its were used to collect the data.



Then the researchers let participants create their account for palette. They observed if participants were able to create an account themselves and if necessary, the researchers helped the participants. The researchers wrote down any problems that occurred and answered the questions asked by participants. At the end of the meeting, participants were thanked and the next steps were presented. They were explained that the questionnaire would be sent by e-mail. Each focus group took about two hours. Afterwards, all results were aggregated and added to a results template.

T=1 Online questionnaire

After one week, participants received an email with a link to the user experience questionnaires that consisted of three questionnaires: IBM⁹; UTAUT2¹⁰ and Desirability cards via questionnaire. After one week, a reminder was sent to the participants that did not respond yet (for all questionnaires used in Alpha, see appendix B or Deliverable 5.2).

T=2 Questionnaire and focus group

Another focus group was organized. The goal of this session was to collect information about the experiences. The focus group discussion was held with five participants. Participants were welcomed and offered something to drink and a sweet snack. A focus group discussion was held around the following topics: what were positive and negative experiences with the platform; suggestions for improvement; what kind of items are nice to attend; how many times the platform was used and at what moments; in which situations the platform can help and lastly if participants would advise others to use the platform and why. Flip charts and post-its were used to collect the data. Participants were asked if they were able to fill in the online questionnaire. One participant filled in the questionnaire on paper. The participants were thanked and were given a gift card of ten euros (bol.com). Also, they were invited to participate in the Beta test.

Switzerland

The procedure in Switzerland was similar to The Netherlands.

Romania

In Romania, the procedure was similar to The Netherlands, except that the participants were tested individually by the researcher. Researchers explained that the test meant that the researcher would not help the user except when the user got stuck and gave up. Participants used Samsung 10 android tablets, no laptops or computers. Also, user comments regarding the usability of the Alpha version were not only noted but also recorded.

Poland

In Poland, the procedure was similar to The Netherlands, except that people were tested individually by the researcher. During the tests researcher noted users' comments and feedback regarding the usability of the Alpha version of Palette. A desktop computer with mouse and keyboard were used.

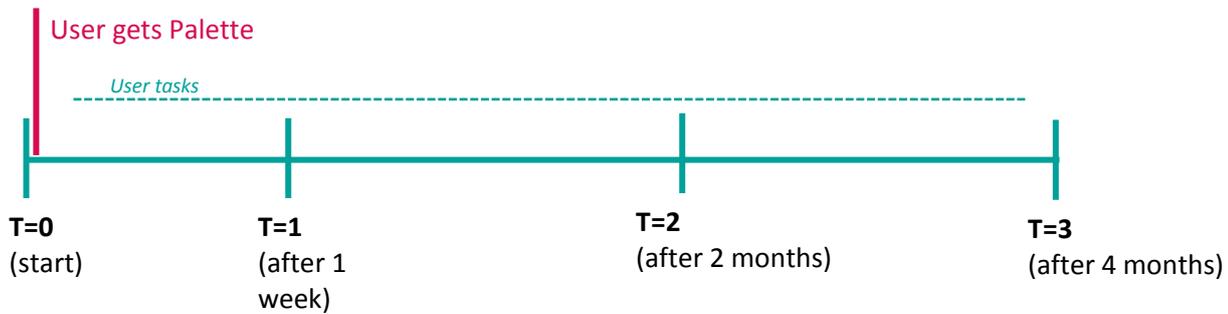
⁹ Lewis, J.R.: IBM computer usability satisfaction questionnaires: psychometric evaluation and instructions for use. *Int. J. Hum. Comput. Interact.* 7(1), 57–78 (1995).<https://doi.org/10.1080/1044731950952611016>.

¹⁰ V. Venkatesh, J.Y.L. Thong, and X. Xu, "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology", *MIS Quarterly*, 36(1), 2012, pp. 157-178.



5.2.2 Beta

The purpose of Beta testing was to let end-users try the platform in situ for four months in The Netherlands, Switzerland, Romania and Poland. The goal was to evaluate the use of palette and the impact the platform has on the daily life of the end-users involved with a main focus on usability, willingness to pay, user acceptance, desirability, self-efficacy and social connectedness (see Table below for the various measurements over time and see appendix C or Deliverable 5.2 for all details of the procedure and the guideline).



	Method	Measurements	When
T=0	Online questionnaire	General questionnaire Questionnaire about expectations Willingness to pay – pre-measurement	T=0
T=1	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 1 week
T=2	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 6 weeks
T=3	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness Willingness to pay - post measurement	T=0 + 2,5 months (Week 5: 28 Jan – 1 Feb)

Procedure

First, we will describe the procedure from the Netherlands, because the guideline was developed there. Then we will highlight the differences in the various countries.

In the Netherlands, the Beta test was done in two municipalities and in each municipality a different procedure was followed. Because of that, we describe both separately below.

City of Sint-Oedenrode



After a care organization in Sint-Oedenrode wanted to participate, we organized three meetings to get participants involved with the platform. We shortly explained the project and showed them an explanatory movie and the platform itself. Then we let them sign the informed consent forms and the general questionnaire. Step by step we let them create an account and gave them a couple of introductory tasks like: try to create an event. After one week, the first questionnaire was sent through e-mail.

After a number of recurrent questions from the participants, we decided to add some tips and tricks to the weekly user tasks, so that people were invited to use the platform and to make it easier for them to try new tasks (for user tasks, see Deliverable 5.2). We noticed that some people were having problems or did not understand some of the features, like selecting interests (with a small group of users, it is better to select more interests to be able to see more events and test the platform) or receiving notifications (“How do I know when something new is happening?”). Some emails with tips and tricks were send out to help participants. Also, these emails contained the user tasks and were used to remind participants about filling in the questionnaires. We decided not to send out the second questionnaire (T2), because most of the participants did not fill in their first questionnaire (T1). Throughout the whole process, we kept in contact with the participants by email and sometimes by phone. We organized a final meeting, so that people could tell about their experiences. Also, we sent all participants a gift voucher after the T3 measurement, to thank them for participating.

If you would like to stay informed about all the new activities on the platform, you can change the settings so you receive notifications. [Explanation about the settings.]

When you create an event, it will appear in the tab “My Palette”. When you see your event in “My Palette” you successfully uploaded an event.

Figure 2.1: Examples of tips by email

City of Oisterwijk

Because some important stakeholders in the municipality of Oisterwijk reported that the platform was not ready yet to be used by their citizens in situ (i.e. their home environment), a controlled test was organized. During a meeting, participants were asked to test the platform and fill in the questionnaires. First, we explained the project and the platform to them. Then we asked them to fill in the informed consent, the general questionnaire (online) and the willingness to pay pre-measurement. Then we gave them some tasks: create an account, create an event, react to an event. Lastly, they were asked to fill in the user experience questionnaire (online, developed by &Happy, see example in paragraph 2.6) and the willingness to pay post-measurement (on paper). At the end of the meeting all participants received a gift card of ten euros (bol.com).

Switzerland

In Switzerland, the procedure was similar to the procedure in The Netherlands (in Sint-Oedenrode), but they sent the participants a list of things they needed to do in order to connect to the platform and start using it (a tutorial and to-do list). Participants were recruited by contacting different type of care organizations (public & private organizations) addressing senior citizens in order to promote the platform. The project was presented, and flyers and/or posters were distributed with an email address and a telephone number so that people interested in the project could contact the researchers. Afterward the participants provided consent, the questionnaires were sent. Only in Switzerland, the T2 was solely executed. During the process, the researchers decided to stop measuring the willingness to pay because participants started to distrust the platform. The researchers ensured that they were available through email or phone to answer questions. By having telephone conversations and meeting some of the users, researchers could reassure and encourage users to continue.



Romania

The procedure in Romania was also similar to the procedure in The Netherlands (Sint-Oedenrode), except that some participants were tested individually by the researcher, depending on the will and skill level of each participant. Also, they used Samsung 10 android tablets for the tests with users. Before collecting feedback, participants were helped using the technology. Users were shortly instructed before the tests. Also, in Romania, the researchers decided not to measure willingness to pay, because in Romania a lot of seniors have money issues. Researchers talked to users on the phone every time they had an issue regarding the platform (or the tablet of desktop they were using) during the whole Beta testing period.

Poland

In Poland, the procedure was executed in the same way as in Romania. They also were in phone and email contact with the users during the whole Beta test. One difference is that they used desktop computers with mouse and keyboard instead of tablets.

2.4 Measurements

To evaluate and validate the platform, a variety of measurements was needed. In this section a description of the measurements that have been used is given. During Alpha testing a general questionnaire, the usability cards and the IBM questionnaire were used (see appendix B). In Beta testing we used a general questionnaire, usability cards, IBM questionnaire, UTAUT2 questionnaire, self-efficacy scale, social connectedness scale and a willingness to pay (pre and post) questionnaire. For the complete questionnaire that was used during Beta, see appendix D.

	Method	Measurements	When
T=0	Online questionnaire	General questionnaire Questionnaire about expectations Willingness to pay – pre-measurement	T=0
T=1	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 1 week
T=2	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 6 weeks
T=3	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness Willingness to pay - post measurement	T=0 + 2,5 months (Week 5: 28 Jan – 1 Feb)



5.5.1. General questionnaires

General questionnaire

The general questionnaire was used to get some demographic information like age, gender, education, work situation, perceived technology skill and experience with technology. This informs us about the end-users. In addition, the experimenters will gather knowledge about the subject-pool (e.g., what experiences do they share, are they family/friends, i.e. anything unique about the group that participates).

Questionnaire about expectations

Attached to the general questionnaire, some questions about expectations were asked, like expectations around usability and if the participants were expecting to attend an event or make new contacts.

Willingness to pay – pre-measurement and post measurement

Willingness to pay was measured by a questionnaire based on Breidert, Hahsler & Reutterer¹¹. First, participants were asked to rank three different options in which the platform could be offered. Next, the participants were asked how much they would pay for the different modes. Then some questions followed in which participants could indicate how different options would affect the amount they would want to pay. The approach can proceed as follows: a regular conjoint analysis using non-price attributes only is performed to estimate the respondent's individual utility structure; WTP for product profiles is estimated in a choice-based interview scene (including a non-purchase option). The respondent is presented a sequence of dynamically selected product profiles with associated prices based on a utility structure.

For the complete questionnaire, see appendix D.

Option 1 – Standard membership:

Items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items.

Option 2 – Premium membership:

The standard membership, but with the additional option to highlight your items so they are brought to the attention.

Option 3 – Moderator for supervision:

Items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items. There is a moderator actively involved in the platform.

5.5.2. User experiences questionnaires

Desirability: Product desirability reaction cards

Product desirability reaction cards (Benedek & Minder, 2002)¹² were used by the end-users during the high-fidelity tests from which they had to select a subset in respect to the desirability of the Palette service. Participants were asked to choose three words from the subset of 55 words (see figure below for the subset of desirability reaction concepts). Subsequently they were asked to explicate why they choose these words.

¹¹ Breidert, C., Hahsler, M., & Reutterer, T. (2006). A review of methods for measuring willingness-to-pay. *Innovative Marketing*, 2(4), 8-32.

¹² Benedek, J., & Miner, T. (2002). Product reaction cards. *Microsoft*, July, 29.



Accessible	Desirable	Gets in the way	Patronizing	Stressful
Appealing	Easy to use	Hard to use	Personal	Time-consuming
Attractive	Efficient	High quality	Predictable	Time-saving
Busy	Empowering	Inconsistent	Relevant	Too technical
Collaborative	Exciting	Intimidating	Reliable	Trustworthy
Complex	Familiar	Inviting	Rigid	Uncontrollable
Comprehensive	Fast	Motivating	Simplistic	Unconventional
Confusing	Flexible	Not valuable	Slow	Unpredictable
Connected	Fresh	Organized	Sophisticated	Usable
Consistent	Frustrating	Overbearing	Stimulating	Useful
Customizable	Fun	Overwhelming	Straight Forward	Valuable

Figure 2.2. Subset of 55 words from the set of 118 product desirability reaction cards

Usability: IBM (Computer System Usability Questionnaire)

Usability of the Palette platform was measured by the IBM computer system usability questionnaire (Lewis, 1995)¹³. This questionnaire measures the users' satisfaction with the usability of systems. The questionnaire is composed of 19 questions. Each question is a statement and a rating on a seven-point scale of 'strongly disagree' to 'strongly agree'. You can calculate four scores from the responses to the items: the overall satisfaction score (OVERALL), system usefulness (SYSUSE), information quality (INFOQUAL) and interface quality (INTERQUAL). The 19 items are supplemented by two questions in which users list their three most negative aspects and three most positive aspects of the platform. The term "system" that was used in the questions, was replaced by "the Palette platform". For the full questionnaire, see appendix D.

Technology acceptance: UTAUT2

Technology acceptance was measured by using the UTAUT2 questionnaire (Venkatesh et al., 2003)¹⁴. The questionnaire has seven key constructs that influence behavioural intention to technology use (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, behavioural intention). Each question is a statement and a rating on a seven-point scale of 'strongly disagree' to 'strongly agree'. For the full questionnaire, see appendix D.

Self-efficacy: General Self-Efficacy Scale (GSE)

To assess how users cope with stressful events or difficult situations in life, the General Self-Efficacy Scale¹⁵ was used. The scale measures users' confidence that their actions are responsible for the results i.e. the belief that they can perform a novel or difficult task or cope with adversity. In the context of this evaluation, the GSE can tell us something about the ability to learn new tasks like using this platform. The scale is composed of ten items that refer to successful coping in which participants can give a rating on a four-point scale from 'not at all true' to 'exactly true'. For the full questionnaire, see appendix D.

¹³ Lewis, J. R. (1995). IBM computer usability satisfaction questionnaires: psychometric evaluation and instructions for use. *International Journal of Human-Computer Interaction*, 7(1), 57-78.

¹⁴ Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

¹⁵ Teeuw, B., Schwarzer, R., & Jerusalem, M. (1994). Dutch adaptation of the general perceived self-efficacy scale.



Social connectedness: Social connectedness scale (SCS)

This scale assesses the degree to which youth feel connected to others in their social environment. Social connectedness, i.e. the experience of belonging and relatedness between people, is a central concept in understanding and evaluating communication media, in particular awareness systems. A generic measure based on this construct can support the design of such systems.¹⁶ The Social Connectedness Scale properly reflects the inverse relationship between the item content (i.e., in a negative direction) and the direction of the rating system (from 1 = agree to 6 = disagree). Thus, higher scores reflect a more reported sense of social connectedness and belongingness. For the full questionnaire, see appendix D.

2.5 Tasks Alpha testing

Participants had to perform a total of 25 tasks during the Alpha testing to measure the effectiveness of the Palette platform, consisting of: Click become a member of palette (One on top, One on movie, One in area “how palette”); Create profile (types in name, types in last name, types in Email, types in confirm Email, types in password, types in phone number, selects a country (selecting, typing, both typing and selecting), types in city (selecting, typing, both typing and selecting); Check-box agree with privacy policy; Click on next Select date of birth; Select gender; Click next; Selects interest (only one, multiple interests); click next & Start using palette.

¹⁶Lee, R. M., & Robbins, S. B. (1995). Measuring belongingness: The social connectedness and the social assurance scales. *Journal of counseling psychology*, 42(2), 232.



2.6 Materials

2.5.1 The Palette platform

Since the start of the Alpha test, Palette is a fully functioning platform, on which people can log in, create a profile, see other profiles, select interests, use filters, create items, see events, select events as favourite and react on events by placing comments and evaluate them after they took place. During Alpha and Beta testing, the platform was continuously improved by the Technical partners. For the current platform, see <https://try.palettev2.eu/>. Below, some screenshots of the platform are displayed.

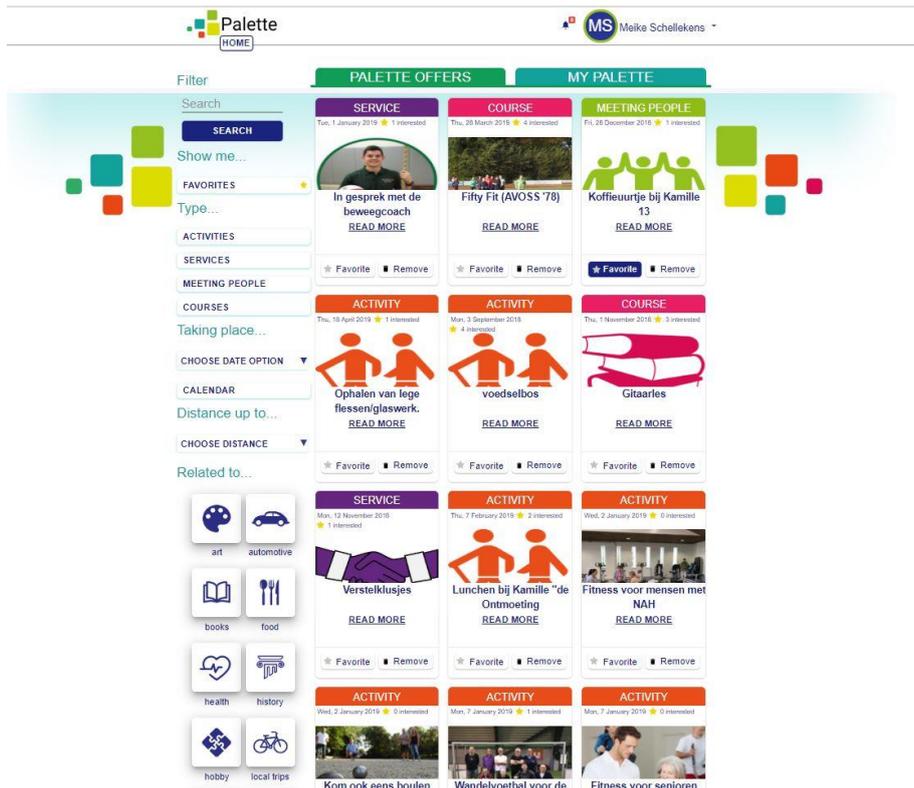


Figure 2.3 Palette offer page

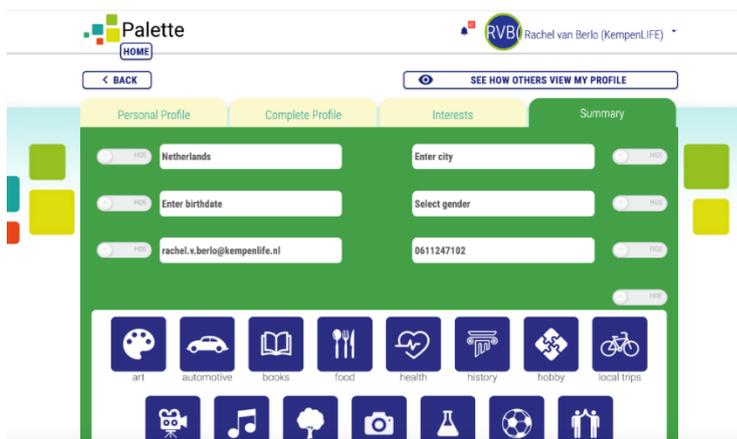


Figure 2.4 Create profile



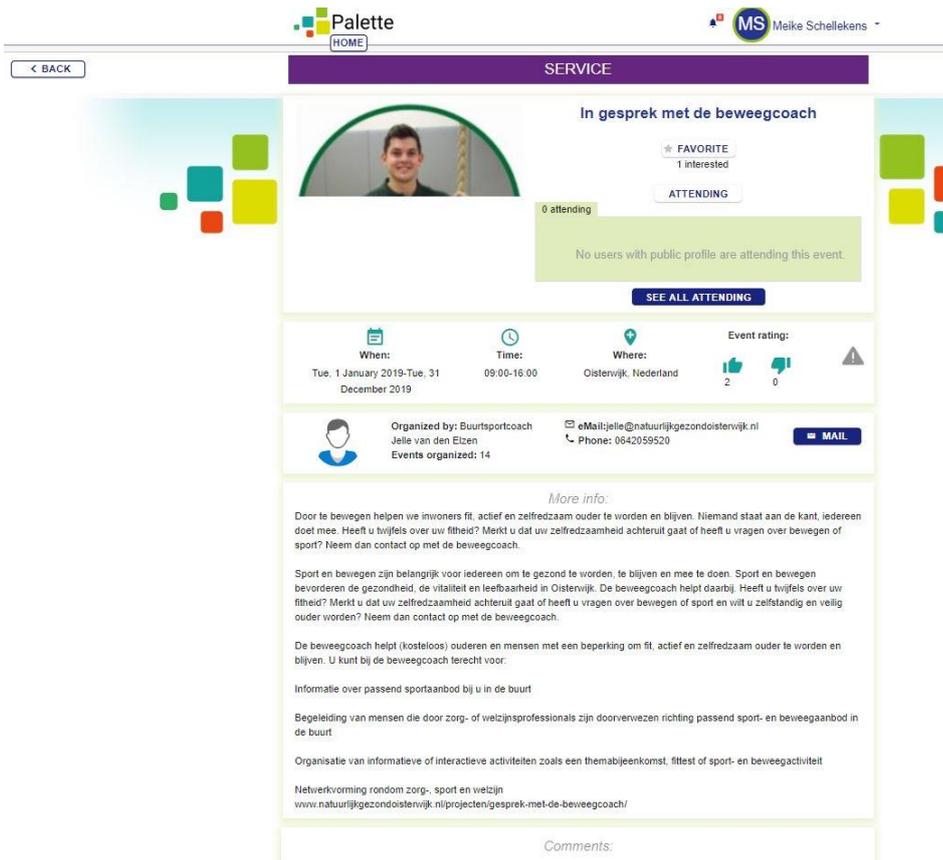


Figure 2.5 Offered service

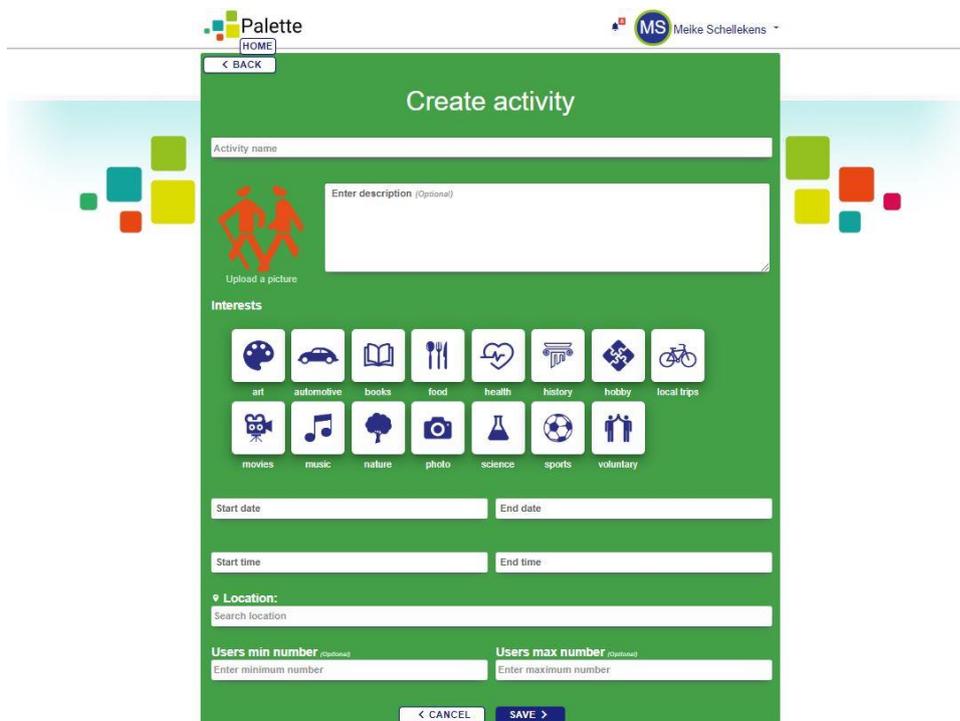


Figure 2.6 Create activity



2.5.2 Online questionnaires

To make the questionnaires more interactive and attractive to fill in, in the Netherlands we worked together with a company called &Happy. Together with them, we adapted their 'QuestionR' to fit with the purpose of our questionnaires. The 'QuestionR' is a chatbot in which you can program your own questions and answers. It can be used on multiple devices. Below are some images of the QuestionR. See <https://vilans.questionr.nl/single> for the full questionnaire (in Dutch).

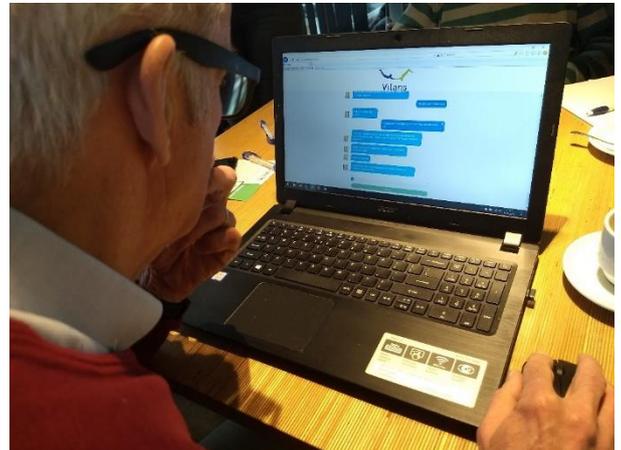
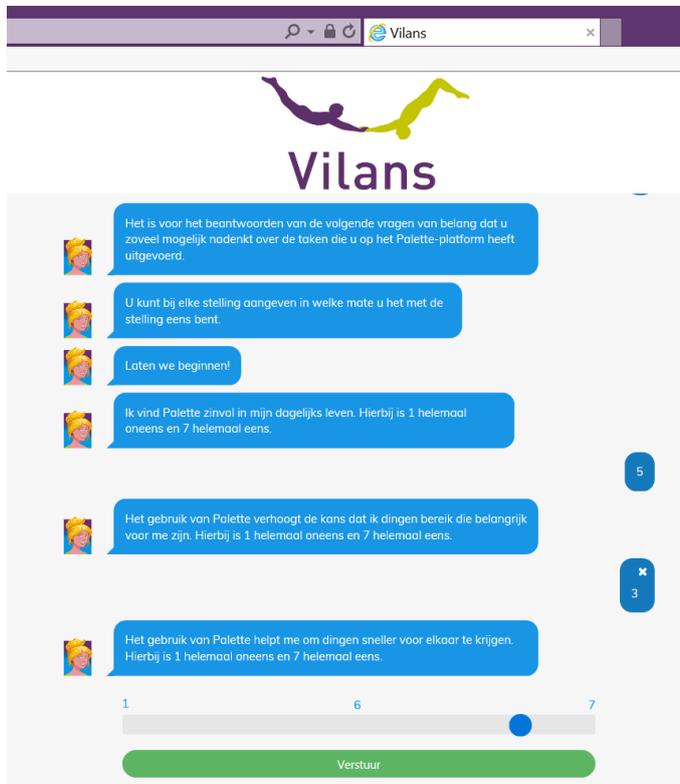


Figure 2.7 Screen capture of the QuestionR



2.5.3 Informative animation video

A short 2-minute informative animation video was made for potential end-users with some basic instructions what type of tasks you can perform on the platform (e.g., make a profile, search for events and join an event). The animation video can be clicked on whenever a user enters the Palette platform (see to the right 'Video afspelen', translated to English 'Play video'). Screen captures of the animation video are presented below.

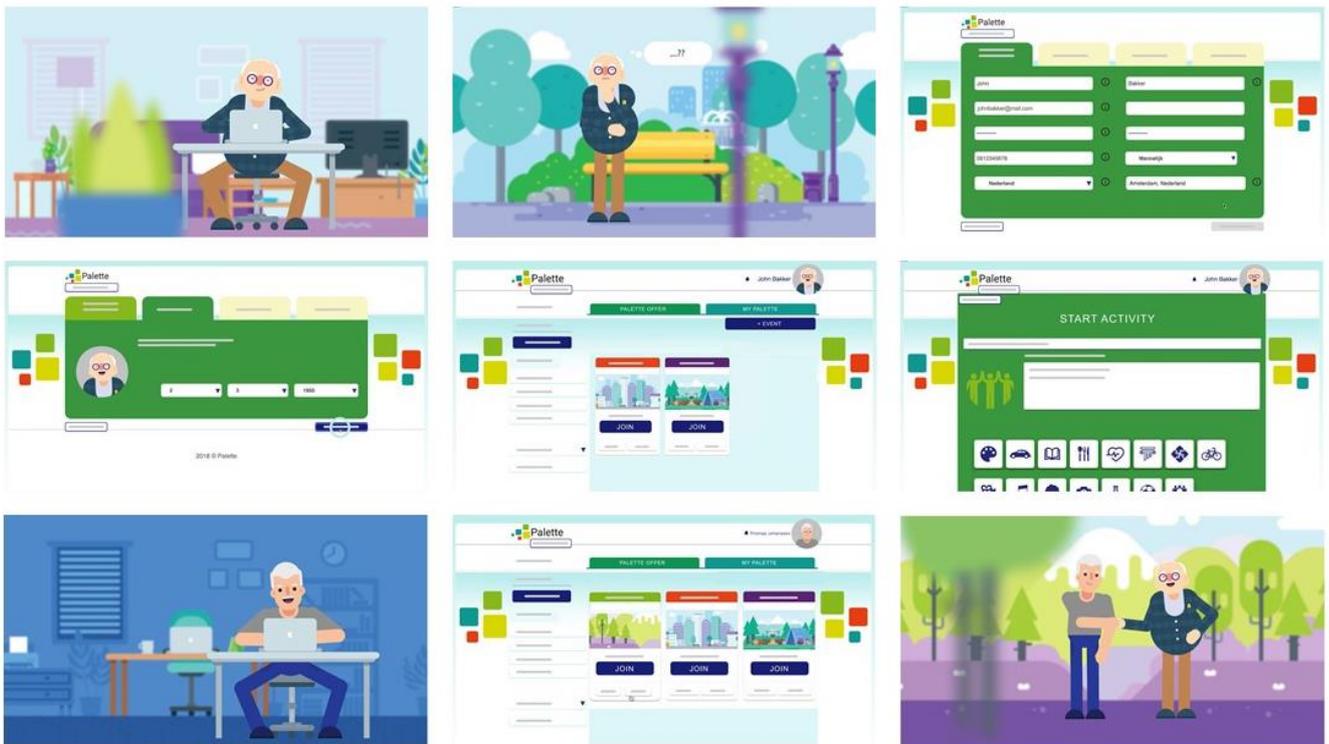


Figure 2.8 Stills from the explanatory movie

3. Results

In this chapter, we will describe the results from the Alpha and Beta test. We do so by answering the previously posed research questions according to seven themes: system data, usability, desirability, technology acceptance, self-efficacy, social connectedness and willingness to pay. The quantitative results from the questionnaires are shown and complemented by qualitative results that were articulated by participants in the questionnaires, in emails and in meetings.

3.1 Data received

Participants

In total, 33 end-users participated during the Alpha test and during Beta testing there were 74 participants in the first phase of the test. During the Alpha test, especially in The Netherlands some participants stopped using the platform and filling in the questionnaire. 5 out of participants were present in the second focus group. In Switzerland and Romania, there were no drop outs during the Alpha test, in Poland 2 seniors did not participate in T2 of the Alpha test.

During the Beta test we see that from the total of 16 participants in Switzerland, seven people were actively involved during the beginning and in the end 3 participants were still involved. In The Netherlands, from the 41 participants in T1, 33 participants filled in the user experience questionnaire and 18 participants filled it in completely. In T2 only one of 10 participants didn't fill in the questionnaire completely. Three participants actively signed out of the test because they were too busy with other activities. In Poland and Romania all participants that were still active in the Beta test, filled in the questionnaires completely. Most mentioned reasons that participants stopped using the platform were that they were too busy, that there was not enough happening on the platform and that the research load was too big.

System data

In the table the activities of the Beta test participants are illustrated. In the Netherlands worthy of noting is that we saw a distinct increase of activities on the platform after sending newsletters during the Beta test. The table only displays users that participated in the longitudinal Beta test (St. Oedenrode test sight).

Table. 3.1 Beta study user activities on the platform

	Users	Items Created	Comments written	In-mail service
Switzerland	7	50	6	0
Romania	7	7	5	0
Poland	6	4	3	1 and 1 phone
Netherlands	7	13	16	4

3.1 Usability

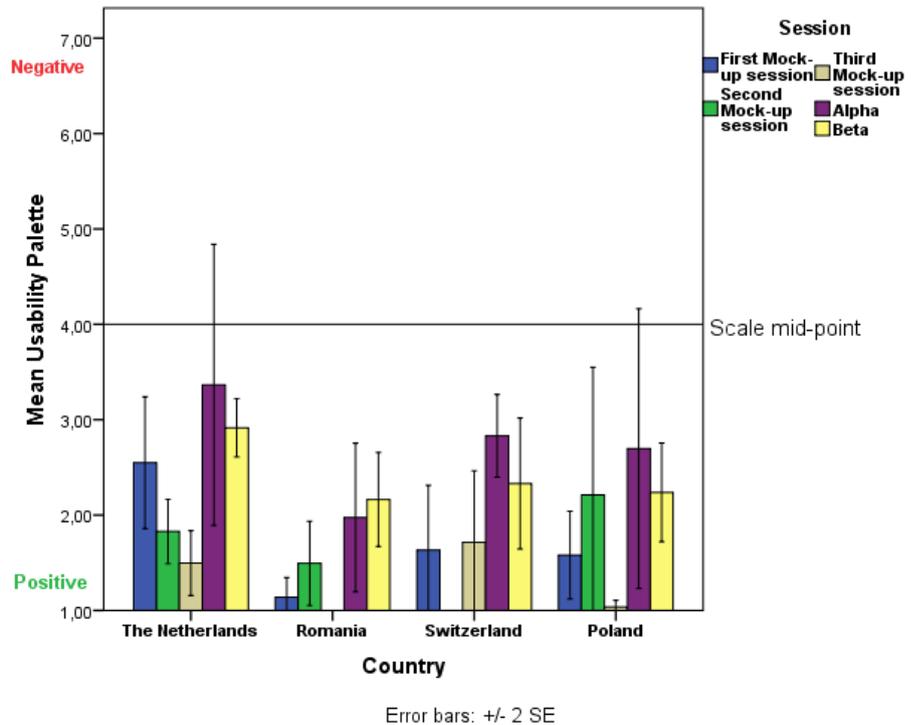
As mentioned, the usability was measured by using the IBM usability questionnaire. The overall satisfaction score (Mean Usability), System Usefulness, Information Quality, and Interface Quality was calculated for the



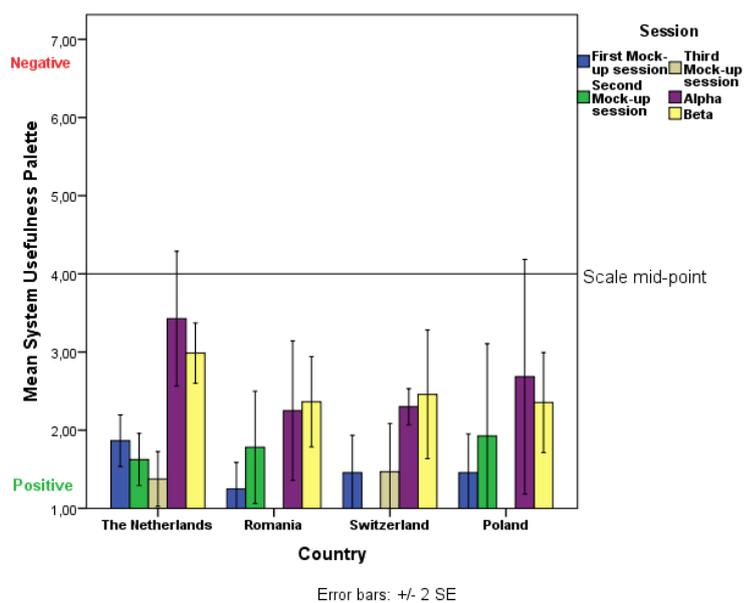
four countries (The Netherlands; Romania, Switzerland, Poland) per design phase. The design phases varied from the first mock-up session to the second and third, and from Alpha to Beta.

A Linear Mixed Models Analysis (LMMA) was performed on Overall Usability with Design Phase / session (First Mock-up, Second Mock-up, and Third Mock-up session, and Beta & Alpha phase) and Country (The Netherlands, Romania, Switzerland & Poland) as fixed factors and participant number as random factor. A significant effect was found of Design Phase on Overall Usability [$F(4,126) = 8.364, p = 0.000$] and of Country on Overall Usability [$F(3,128) = 5.624, p = 0.01$]. The participants from The Netherlands rated the Overall usability significantly lower than the participants from Romania [$p = 0.00$]. In addition, the Overall usability was significantly lower in the Alpha phase than in the; First mock-up phase [$p = 0.002$]; Second mock-up phase [$p = 0.003$]; and third mock-up phase [$p = 0.000$]. Similar results hold for the Beta phase compared to the mock-up phases, although less extreme.

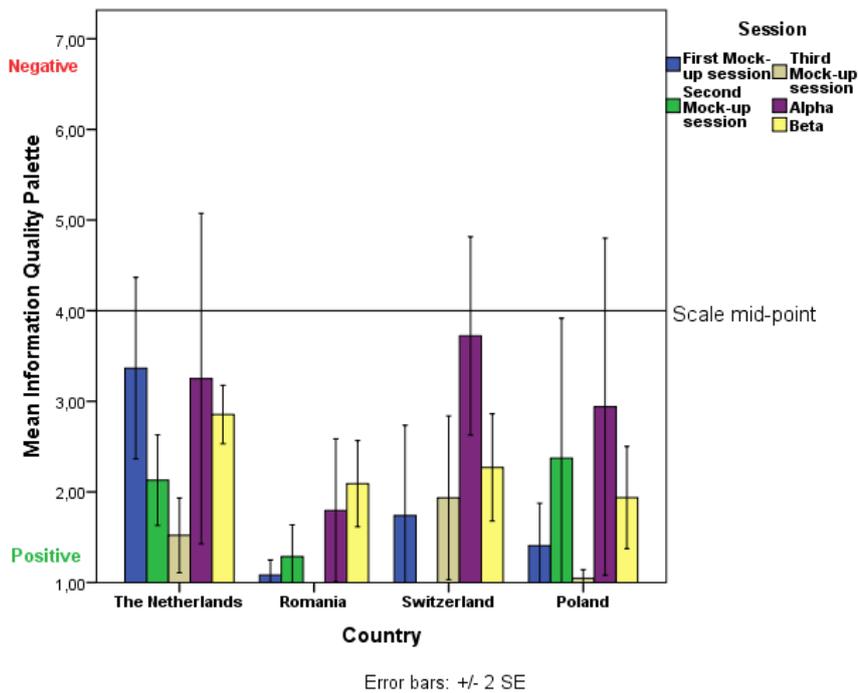
The mean usability scores show that the means per country and design phase are all on the positive side of the scale (below the mid-point of 4). The mean usability is more negative of the Alpha prototype than of the Beta prototype. So, from Alpha to Beta, the usability of Palette is increasing positively.



No significant effect was found of country on System Usefulness. However, a significant effect was found of Design Phase on System Usefulness [$F(4,124) = 10.815, p = 0.00$]. For all comparisons, the Alpha and Beta System Usefulness was significantly lower than for the First, Second, and Third mock-up testing phases [$p = 0.000 - 0.001$]. From the means it appears that the system usefulness scores are overall much lower in the mock-up sessions, then in the Alpha and Beta study. The system usefulness during the mock-up testing was 'simulated', while in Alpha and Beta Palette was (semi) functionable and working online. Overall, the system usefulness was lowest for the participants in The Netherlands. Nevertheless, the means per country and design



phase are again all on the positive side of the scale (below the mid-point of 4).

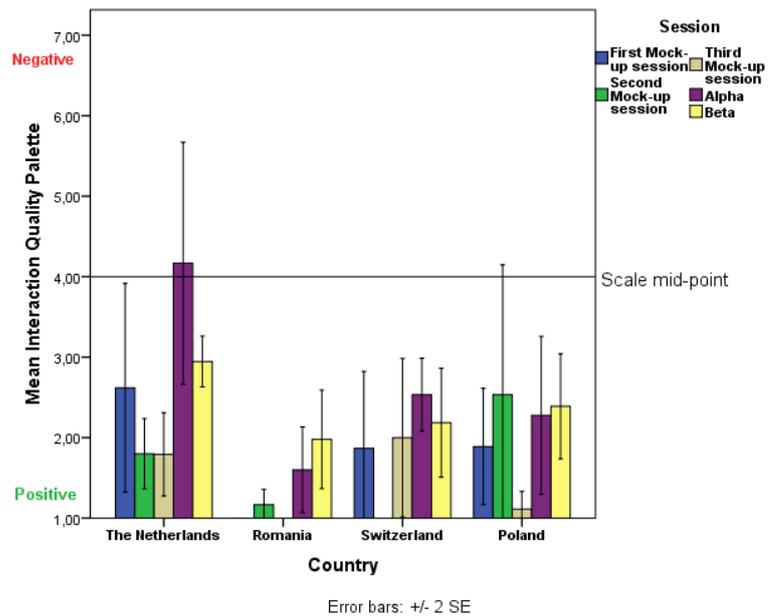


A significant effect was found of Country on Information Quality [$F(3,127) = 7.045, p = 0.000$] and of design phase / session on Information Quality [$F(4,125) = 5.516, p = 0.000$]. The Information Quality was rated significantly lower in The Netherlands compared to Romania and Poland, and lower in Switzerland than Romania [$p = 0.000 - 0.014$]. Again, Information Quality was significantly lower in the Alpha and Beta phases than in the Mock-up phases. Interestingly, Information Quality was highest during the Third Mock-up phase.

A significant effect was found of Country on Interaction Quality [$F(3,128) = 7.685, p = 0.000$] and of design phase / session on Interaction Quality [$F(4,112) = 3.610, p = 0.008$]. Again, Interaction Quality was significantly lower in the Alpha and Beta phases than in the Mock-up sessions, except between the Beta and the First mock-up. Mean Interaction Quality was also on the positive side of the scale for all four countries and design sessions (below the mid-point of 4). It should be noted that the Interaction Quality was lowest for the Alpha prototype, which is reflected in the quality results and feedback received in respect to translation errors and instructions that were missing.



Finally, the interaction quality of Palette was relatively high for most of the design phases, except for the Alpha prototype in The Netherlands, and also somewhat for the Beta prototype. Again, this was also observed during the sessions in which participants were in need of quite some support in performing the tasks.



3.2.1 Qualitative results usability

Participants were divided about the usability of the platform. Some were really positive and thought the use was easy to understand and was quite intuitive. But others were less positive and thought Palette was difficult to understand and use. Some remarks were made about the filters and especially the log in process was difficult for a lot of participants. In multiple sessions, researchers observed that the process of logging in took a lot of time and was unclear to end users.

Some usability issues can be difficult for senior end users and negatively influenced their experience of usability:

“Got a notification of a reaction from someone on my service/question. Could not find this. Was complicated search process” (Participant from The Netherlands, Beta)

“Setting hour is difficult - 2 clocks for hour and for minutes are confusing” (Participant from Romania, Beta and also observed several times by researchers in different countries)

“It’s unclear to me how the column to the left (filter) works” (Participant from Romania, Beta)

But, to illustrate how opinions can differ among users, another participant reported opposite remarks:

“Any interest can be easily accessed in the Palette platform” (Participant from Romania, Beta)

About the design of the interface, most participants were positive, but then again, some others thought the interface was unclear:

“I like how everything is arranged and the colours” (Participant from Romania, Beta)

“Sometimes there is too much information in one screen.” (Participant from The Netherlands, Beta)



3.2.2 Three Most Negative Aspects of Palette

Poland	Romania	Switzerland	The Netherlands
<p>The name "past activities" sounds strange, maybe "old" or "completed"? (this might be just the case in Polish translation)</p> <p>no possibility to click on the event picture to see more</p> <p>Despite the changes, the platform seems a bit dead - only a few people show that they want to attend an event.</p> <p>It's unavailable for people who don't have computers</p> <p>Old events are "up" for a long time, there's not enough current events or events in the future.</p>	<p>It's unclear to me how the column to the left (filter) works</p> <p>Little to do here during winter</p> <p>It was difficult to understand how the left column (filter) works</p> <p>The map doesn't work - I can't use an exact location, only Bucharest</p> <p>Not many events yes</p> <p>The hour is hard to set on a tablet</p> <p>I can't notice any negative effects, but I can see a great lack in users for all activity types presented in the platform</p> <p>It's hard to find something to do on this platform</p> <p>When inserting the password, it wasn't clear what types of characters I may use (information button not intuitive enough)</p> <p>I cannot actually know information about the people I meet</p> <p>There is little activity</p> <p>setting hour is difficult - 2 clocks for hour and for minutes are confusing</p> <p>it's too bad we don't get to select the event picture from a database; it's difficult for me to find nice pictures</p> <p>after I search for something using one criterium I have to uncheck it, otherwise it stays checked - very confusing for further research</p>	<p>Which I miss not knowing other users in order to create events together. I'm missing a voicemail.</p> <p>What I find unfortunate is that I don't have a list of Users at my disposal.</p> <p>At first it was disconcerting, the design was unfamiliar.</p> <p>At first too many icons and then it's fine</p> <p>Icons a little big</p> <p>I cannot answer, because objectively no answer can be designated "no". There are missing icon choices. This is not clear.</p> <p>I still have to look for information. For me, there are some stickers missing.</p> <p>Right now, I'm bored on this platform.</p> <p>Difficult to choose from the themes and</p> <p>Creation of virtual or real events</p>	<p>Log in repeatedly, no overview in date of activities</p> <p>About the system as it is, none</p> <p>I worked with these kinds of programmes before, in practice it is quite difficult to let people be a part of it for the long-term. Without a strong network you already have, people don't respond (anymore)</p> <p>It is time-consuming, and I don't reach the people I want to reach. That is part of the development of Palette</p> <p>The number of users has to increase</p> <p>Couldn't log in, that wasn't solved. Couldn't use Palette because of that.</p> <p>Got a notification of a reaction from someone on my service/question. Could not find this. Was complicated search process</p> <p>Absence of possibility to have direct email contact and chat with participants.</p> <p>Not enough experience. To me this questionnaire obviously came too soon.</p> <p>Slowness, lack of variety in offer, not easy enough</p> <p>I think the care cooperative wants to be(come) intermediate with matching the supply and demand in the field of 'white services'. I hope that with Palette they can fulfil that role of the manager.</p> <p>Haven't been active enough to say something</p> <p>Would like to have more explanation individually</p> <p>Too cluttered, confusing</p> <p>Too complicated</p> <p>Difficult to log in for Apple user</p>



Introduce the platform for all citizens. The ones who are not computer-literate or don't have a computer should be helped or mentored. My statement is that at most 1 in 5 citizens will make use of this platform. That is what I call the role models, assertive, active, healthy. This platform should be made accessible for everyone by policy of the municipality and by offering conditions and support. Everyone is equal and is treated in the same manner.

I couldn't prepare myself well. More information beforehand would have been nice for me. The use will show us, this was just a demo.

Impression is a bit busy.

Sometimes there is too much information in one screen.

3.2.3 Three Most Positive Aspects of Palette

Poland	Romania	Switzerland	The Netherlands
Very nice, appealing interface.	It's colourful	The idea is great because it's easy to use	Icons of activities
Clear content	Aesthetically pleasing	A great communication tool for people who want to learn about digital	Good medium against loneliness
Clear Colourful	It's looking good It's got potential	Great to use Easy to use	It is an opportunity If more people use it, you can connect people and activities
Clear	I like the first page pictures	Beautiful colours. Clear menus. Interactivity.	Very useful and user-friendly
Accessible	I could find out about new meetings	Clear colours	Many possibilities to get to connection and exchange
It makes it easier to contact your peers in the nearest neighbourhood. Needed for retired people	Any interest can be easily accessed in the Palette platform, and the interface is nice Clear structure of information	Graphism	Fresh layout, easy to use and is not only about elderly and care.
Appealing	I can connect with people with same interests as me	Joyful and playful	Clear and fresh appearance. Easy to use.
Easy to use	I like how everything is arranged and the colours	Happy	Too little experience
	Easy to navigate, efficient	Gives ideas.	Thanks to palette i did a nice activity and i offered an activity that will be carried out soon. So thanks to palette a couple of communicative activities and a couple of contacts.
	Easy to use		Discovering an accessible network of people, wishes, needs... On to a caring community. Very good goal
			The explanation was good but too short! Opens possibilities fitting your profile



Moves people to look, search and get new ideas.
Clearly visible and readable
Easy to use
User friendly/inviting
Could become fun
Accessibility and user friendliness
Improve contacts between seniors, give help where it's needed. I wonder how much there should be payed for given services. If it's free, it is strange that you have to pay as a member to offer free services.

3.2.4 Effectiveness tasks Alpha testing

The mean effectiveness of the tasks for the countries was 0,74, indicating that the participants performed more than 70% of the tasks correctly during the Alpha testing.



3.2 Desirability

The results in respect to the frequency of the desirability words chosen are presented in the following section for the Alpha phase and Beta phase.

3.3.1 Alpha



Figure 3.1: Word Cloud of desirability words chosen in the Alpha phase at T1 for all 4 countries (left) and for T2 (right).

Table 3.2: Frequency of the desirability words chosen during Alpha testing at T1 & T2

Alpha testing	T1		T2	
	Frequency		Frequency	
	N		N	
	7	Easy to use	8	Easy to use
	6	Useful	5	Simplistic
	5	Inviting	4	Empowering
	4	Accessible		

Qualitative results

We can see that during the Alpha test, users thought the platform was easy to use. Participants reported both about the ease of use and usefulness / desirability of Palette.

“The interface is simple, with the necessary information” (Participant from Switzerland, T1)

“It's easy to use, without unpleasant surprises, and useful for collaborating. I would like to continue using it and make more elaborate evaluations.” (Participants from Romania, T1)



“It bonds the senior society. It’s easy to use and explore. Every user should be capable of managing this application.” (Participant from Poland, T2)

During the first phase of the Alpha test, participants reported that the platform was inviting:

“The colours are pleasant, and the events are well organized” (Participant from Switzerland, T1)

And also, during the first phase, participants reported that Palette is useful because of the possibility of meeting other people and finding activities to perform:

“Palette can be a good tool for people looking for activities or contacts” (Participant from The Netherlands, T1)

We see a small shift in the words chosen during T1 and T2 of the Alpha test. Although participants reported almost as often that the platform is easy to use, they also thought of the platform as simplistic and empowering:

“It gives the opportunity to find out about upcoming cultural life events, it motivates to continue working with a computer with the Palette project, usable for developing my interests.” (Participant from Poland, T2)

But participants also had some remarks about bugs and usability:

“The use is simple, but the operation, possibilities, and integration into the real community is not usable now. Furthermore, there are many bugs and gaps.” (Participant from the Netherlands, T2)



3.3.2 Beta

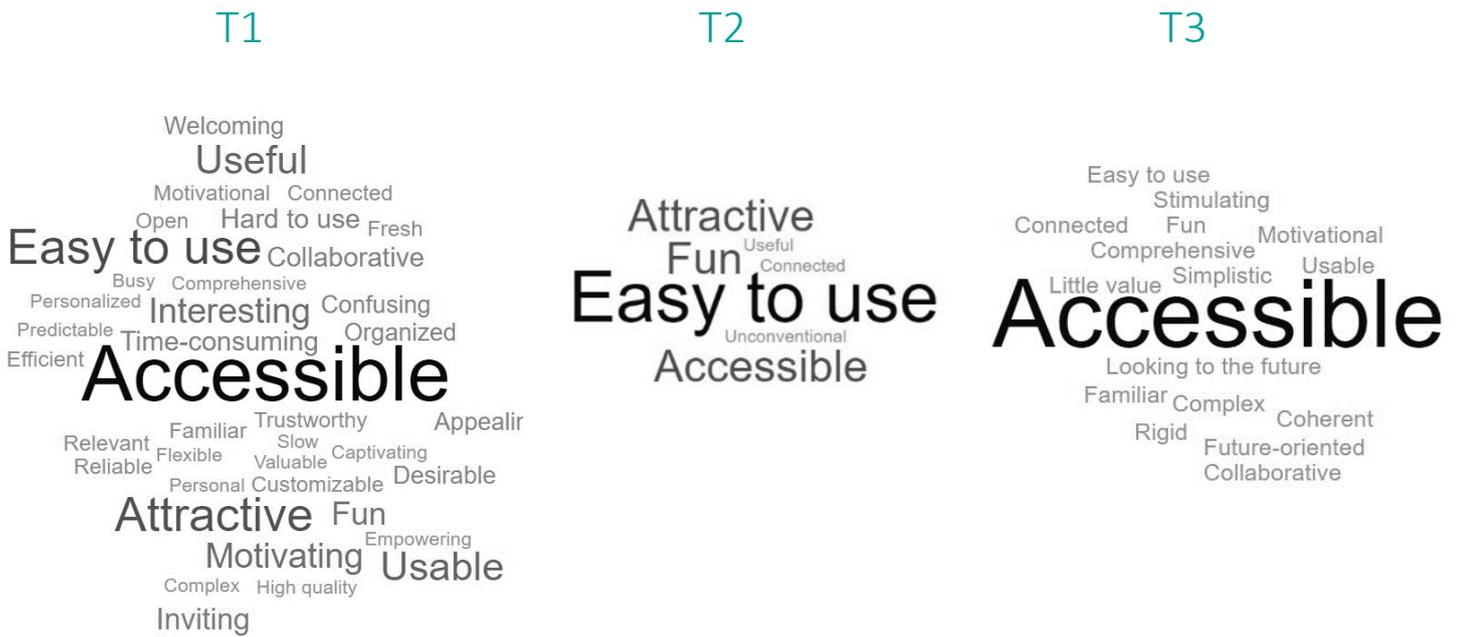


Figure 3.2: Word Cloud of desirability words chosen in the Alpha phase at T1 for all 4 countries (left), for T2 (middle) and for T3 (right).

Table 3.3: Frequency of the desirability words chosen during Beta testing at T1, T2 & T3

Beta testing	T1		T2		T3	
	Frequency		Frequency		Frequency	
	N		N		N	
24		Accessible	3		6	Accessible
13		Easy to use	2			
12		Attractive	2			
9		Useful				
9		Usable				

Qualitative results

We can see that a lot of the participants thought Palette is accessible, throughout the whole Beta test users reported the following:

“The Palette interface was easy, even for those who do not have many ICT experience and skills”
(Participant from Romania, T1)

“Accessible through its ease of use and welcoming through its interface” (Participant from Switzerland, T1)

Mostly in the first phase of the Beta test, participants reported that they found Palette attractive and appealing, because of the colours and it is easy to notice it. Also, participants reported that Palette was easy to use, because of its simple design, easy interface and the well-structured information. But users also reported about the things it is easy to use and useful for:



"It is a simple way to make new contacts with people that you don't know or barely know" (Participant from The Netherlands, T3)

"It has interesting offers, interesting trips, it gives opportunities to see new things and things that interest you" (Participant from Poland, T1)

"It's presented clearly, it's definitely useful for developing seniors' activities, it's motivating for developing interests." (Participant from Poland, T1)

On participant thought of Palette as attractive and easy to use, but also had some remarks about similarities to other platforms:

"It is fun, attractive and easy to use: A program made for the "non-computer" generation (my case year of birth 1952). This program allows you to be creative without too many digital complications. However, as I am very active on FB, Instagram and Twitter it will be more interesting to have an opinion of people without these activities. Because indeed I found a lot of similarities. But I'm sure Palette allows communicative people to get started in a smaller radius." (Participant from Switzerland, T2)

Some other remarks participants made were that for some of them it was a bit hard to use, and that they missed some features, like a chat function or a database for pictures to create events. Also, some people reported they got a bit discouraged to use it because of different reasons:

"I think it sometimes is a bit slow. And there were too many offers that were too far away from home. I think such a platform works better within a smaller community" (Participant from The Netherlands, T3)

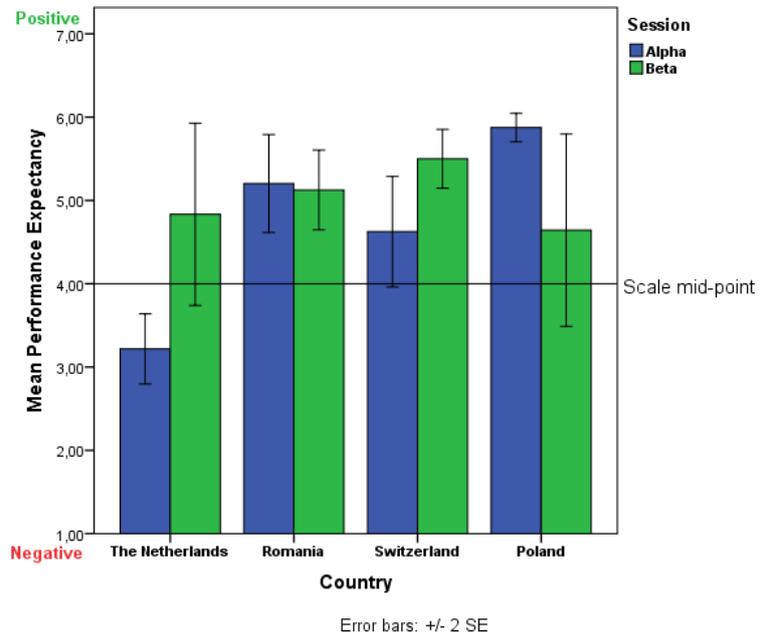
"Despite the changes, the platform seems a bit dead - only a few people show that they want to attend an event." (Participant from Poland, T1)

Interesting to note, is that during the last phase of the Beta test (T3), accessible was reported six times, but all other words were chosen once or twice by the participants. It seems that participants who used the platform for a longer time, had more diverse opinions about the platform.



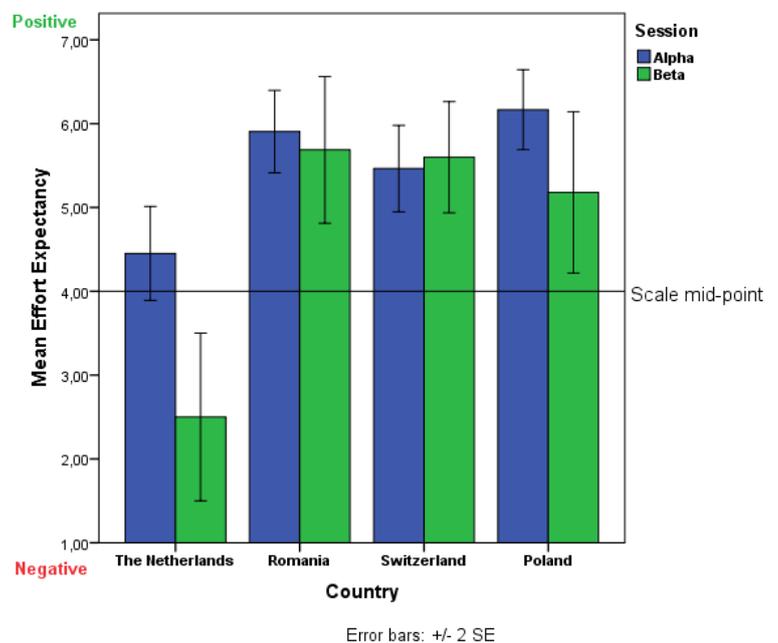
3.3 Technology acceptance

The technology acceptance was measured by using UTAUT2 questionnaire in the Alpha and Beta testing phase in the four different countries. A Linear Mixed Models Analysis (LMMA) was performed on 'Performance Expectancy' with Design Phase / session (First Mock-up, Second Mock-up, and Third Mock-up session, and Beta & Alpha phase) and Country (The Netherlands, Romania, Switzerland & Poland) as fixed factors and participant number as random factor. A significant effect was found of Country on Performance Expectancy [$F(3,72) = 13.120, p = 0.000$] and no significant effect was found of design phase / session on Performance Expectancy, i.e. no difference between both phases. The participants from The Netherlands rated their Performance Expectancy significantly lower than the participants from Romania, Switzerland and Poland [$p = 0.00$].

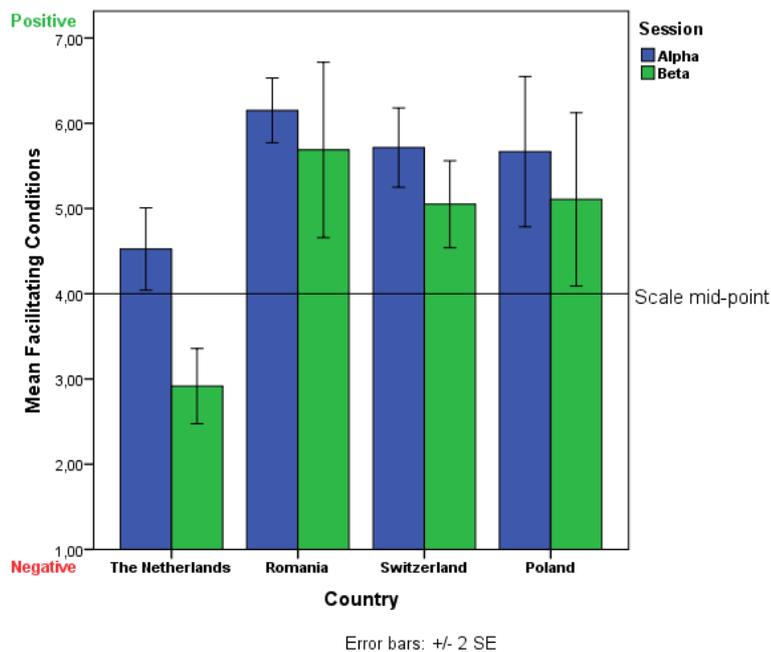
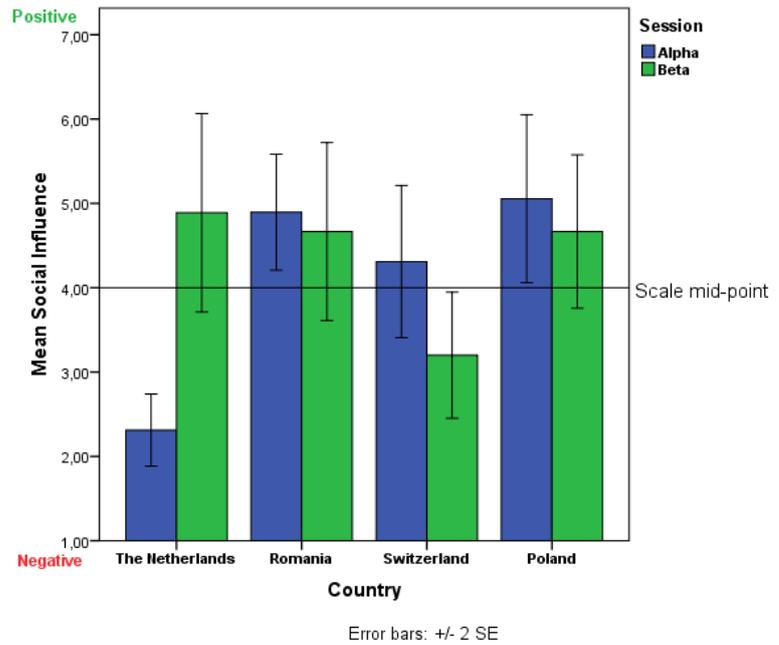


From the figure it becomes clear that the 'Performance Expectancy' was relatively low during the Alpha phase for the Dutch participants. Yet, overall, the other scores are above the scale mid-point of 4, i.e. on the positive side of the scale.

A significant effect was found of Country on Effort Expectancy [$F(3,67) = 10.484, p = 0.000$] and of Design Phase on Effort Expectancy [$F(1,45) = 4.859, p = 0.033$]. Again, Effort Expectancy was significantly lower for The Netherlands, then for the other 3 countries [$p = 0.000$]. From the figure it becomes clear that the Effort Expectancy was relatively low for the participants from The Netherlands during the Beta testing phase. It is likely caused by the complicated registration phase with multiple steps and email confirmation that did not work or arrived in the mailboxes of the participants. In addition, the Dutch participants brought their own device, with iPads that did not work that well in combination with Palette. Nevertheless, Effort Expectancy was for the other sessions and countries above the scale mid-point of 4.

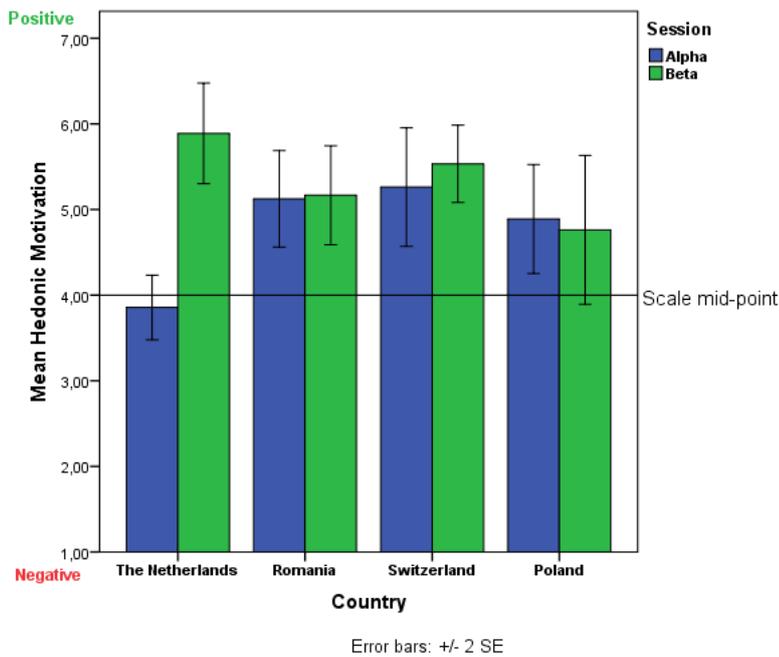


A significant effect was found of Country on Social Influence [$F(3,73) = 16.129, p = 0.000$] and no significant effect was found of design phase / session on Social Influence, i.e. no difference between both phases. Again, Social Influence was significantly lower for The Netherlands, then for the other 3 countries [$p = 0.000$]. In addition, Social Influence was rated significantly lower during the Beta phase in Switzerland than in Romania [$p = 0.26$].



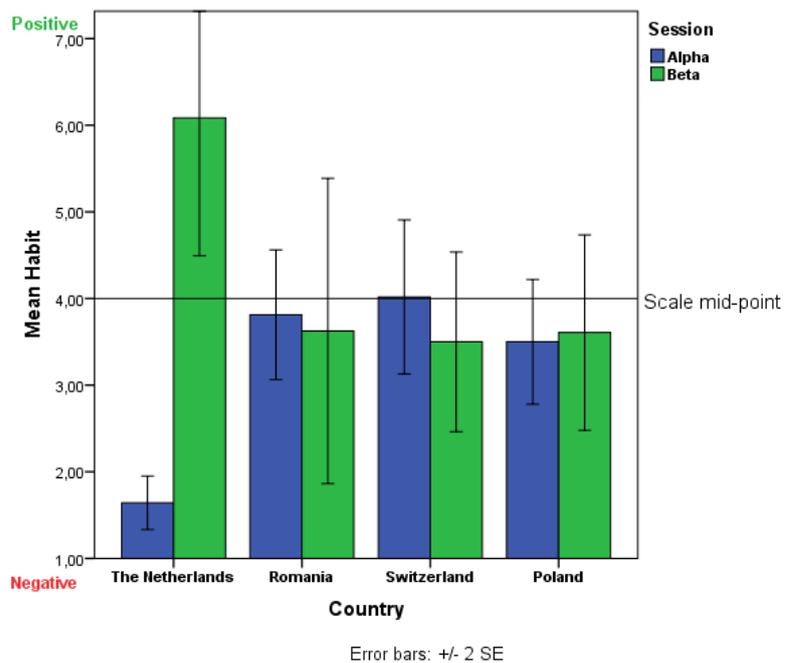
A significant effect was found of Country on Facilitating Condition [$F(3,69) = 12.555, p = 0.000$] and of Design Phase on Effort Expectancy [$F(1,50) = 9.067, p = 0.004$]. Facilitating Conditions was rated significantly lower by the participants in The Netherlands than in the other 3 countries [$p = 0.000-0.001$]. In addition, Facilitating Conditions were rated significantly lower during the Beta phase than during the Alpha phase [$p = 0.004$]. It is likely that this was related due to the additional functionalities and registration phase. Nevertheless, for 3 out of 4 countries, Facilitating Conditions were rated higher than the scale mid-point of 4 (i.e., on the positive side of the scale).

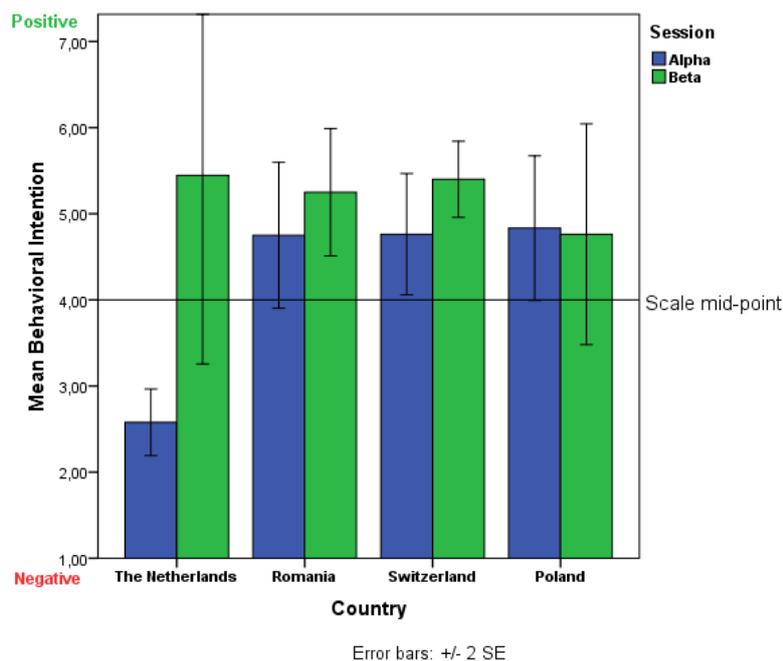




A significant effect was found of Country on Hedonic Motivation [$F(3,71) = 7.197, p = 0.000$] and not for Design Phase / Session on Hedonic Motivation [$p = 0.086$]. Hedonic Motivation was rated significantly lower for the participants in The Netherlands during the Alpha phase than in Romania and Switzerland [$p = 0.000$]. However, Hedonic Motivation was rated significantly higher for the participants in The Netherlands during Beta than during Alpha, and overall, Hedonic Motivation was on average rated around and higher than the scale mid-point of 4 (positive).

A significant effect was found of Country on Hedonic Motivation [$F(3,72) = 8.044, p = 0.000$] and not for Design Phase / Session on Hedonic Motivation [$p = 0.056$]. There was a huge difference between the Habit ratings for The Netherlands between Alpha and Beta, and significantly between The Netherlands and the other 3 countries. Participants during Alpha testing in The Netherlands used Palette in a controlled setting (not at home), which reflects in these Habit ratings, i.e. Palette will not become a habit or natural whenever you use it in a 2-hour timeframe.





A significant effect was found of Country on Behavioural Intention [$F(3,71) = 13.334, p = 0.000$] and Design Phase / Session on Behavioural Intention [$F(1,54) = 7.328, p = 0.000$]. Again, these results are reflected by the Alpha phase in The Netherlands, which was controlled and did not result in a plan or intention to continue using Palette. Nevertheless, for the other 3 countries the Behavioural Intention was for both phases higher than the scale mid-point, and slightly higher from Alpha to Beta in Romania and Switzerland (not significant).

Qualitative results technology acceptance

While some participants reported that the Palette does not necessarily connect them to the people they actually want to reach (because not enough was happening on the platform yet), reducing the technology acceptance, others reported that they actually liked the possibility to meet new people:

“It offers the possibility to meet surprising contacts and join activities with others” (Participant from The Netherlands, Beta T1)”

Also, some participants reported that Palette helped them with learning to use technology, while others report that they think Palette may be too difficult from them, for example this participant from the Netherlands (Beta, T3) reported:

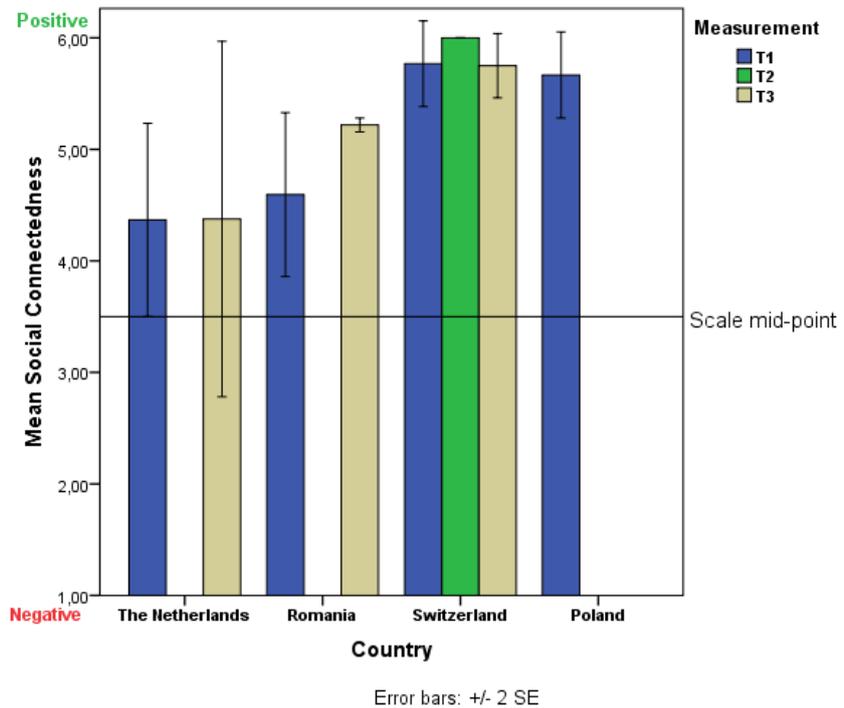
“My initial enthusiasm sank quite soon and I’m sure it had to do with the not platform being not so easy. My inclination to actively participate disappeared than as well.” (Participant from The Netherlands, Beta)

These examples illustrate how strongly it can differ for different senior people to what extent Palette can really be (perceived to be) beneficial.



3.4 Social connectedness

Social connectedness was measured by using the Social Connectedness Scale (Lee & Robins, 1995) and we gathered qualitative data from the physical meetings and emails from participants. Social connectedness was only measured during the Beta test. The intention was to measure self-efficacy over time (T1, T2, T3) in the four different countries. In practice, this was difficult, since the groups that participated in The Netherlands varied with the group in Oisterwijk participating in one 'controlled' Beta session, T2 measurements did not take place in The Netherlands, Romania and Poland. In addition, the T3 measurement did not take place in Poland. Statistical tests were not appropriate on the dataset. From the figure it appears that social connectedness was overall highest in Poland and Switzerland (among the participants) and that there is a positive trend from T1 to T3, i.e. social connectedness among the participants in Romania increased over time.



Qualitative results social connectedness

Although we did not measure social connectedness in a qualitative way, we did receive some qualitative results about it. Mostly, people expect the platform to help them to meet people in the future, when the platform is more mature. Also, some people think Palette can be a good medium against loneliness, and provides a way to connect and bring people together:

“It makes it easier to contact your peers in the nearest neighbourhood” (Participant from Poland)

But one participant made a remark about loneliness in a different manner, in the context of creating events:

“I think it is difficult to articulate my thoughts and feelings of why I’m looking for someone to share an activity with. I don’t want to come across as being lonely or alone.” (Participant from the Netherlands, Beta)

One significant result is that a group of participants from the Beta test in the Netherlands (Sint-Oedenrode) reported that they actually managed to organize a (social) event through Palette and they really enjoyed it:



“Thanks to Palette I experienced a fun activity and offered a pleasant activity that will soon take place. So, thanks to Palette a couple of communicative activities and a couple of contacts” (Participant from The Netherlands, through the questionnaire)

“What I think is special to mention is that I succeeded to organise an activity through Palette. Eight people are going to participate in it. We are going to the Noord Brabants Museum together on January 24th.” (Same participant from The Netherlands, Beta, through e-mail)

The screenshot shows a social media event page titled "bezoek Noord Brabants museum". It features a header with the event name, a "FAVORIEET" button with "2 geïnteresseerd", and a "DEELNEMEN" button. Below this, it states "0 deelnemen" and a message: "Geen gebruiker met een openbaar profiel zal deelnemen". A "BEKIJK ALLE DEELNEMERS" button is also present. The event details section includes: "Wanneer: do, 24 januari 2019-do, 24 januari 2019", "Tijd: 13:30-16:30", "Waar: 's-Hertogenbosch, Nederland", and "Beoordeling evenement: 3 thumbs up, 0 thumbs down". The organizer's information is shown as "Georganiseerd door: [redacted]", "Evenementen georganiseerd: 1", "e-mail: [redacted]", and "Telefoon: [redacted]". A "Meer weten" section contains a link to a post from 09:40 on 10 January 2019, stating "Op 24 januari a.s. gaan wij er met 8 personen naar toe!". Another post from 15:28 on 17 January 2019 asks "Dag Annemiek, Laat je weten welke datum het gaat worden?". A third post from 18:51 on 24 January 2019 reports "Vandaag de activiteit gerealiseerd. Wat mij betreft zeer geslaagd. Het was gezellig met z'n achten en wat te zien was in het Noord Brabants museum was mooi, boeiend en de moeite waard." At the bottom, there is a "Schrijf uw opmerking" field and a "Voeg een opmerking toe" button.

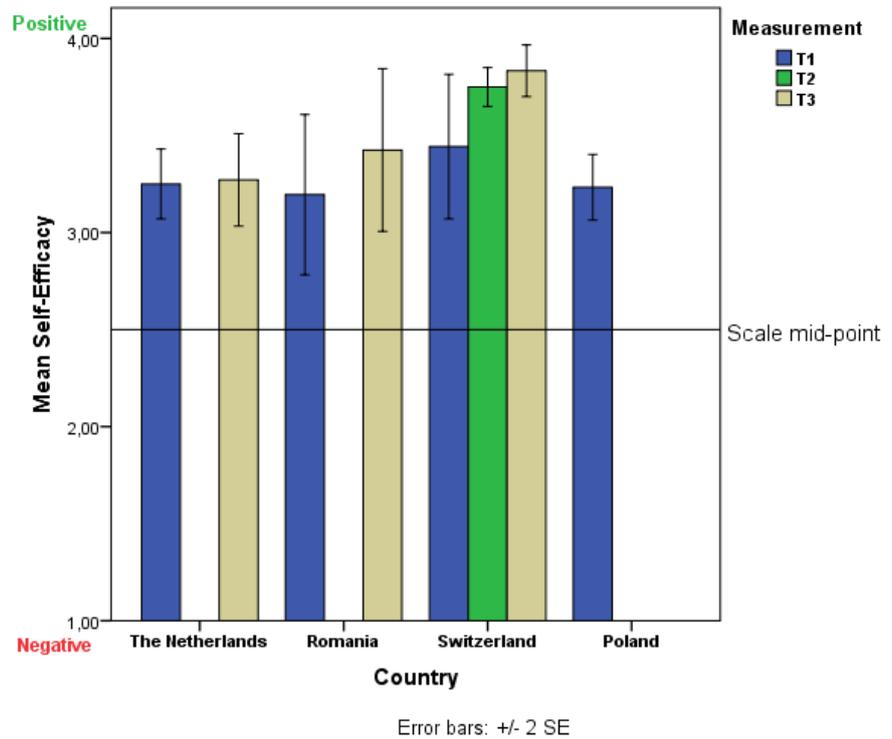
24-01-2018

“Realized the activity today. In my opinion very successful. The eight of us had fun and what was exhibited in the museum was beautiful, interesting and worth it.”



3.5 Self-efficacy

Self-efficacy was measured during the Beta evaluation phase and the intention was to measure self-efficacy over time (T1, T2, T3) in the four different countries. In practice, this was difficult, since the groups that participated in The Netherlands varied with the group in Oisterwijk participating in one 'controlled' Beta session, T2 measurements did not take place in The Netherlands, Romania and Poland. In addition, the T3 measurement did not take place in Poland. Statistical tests were not appropriate on the dataset. However, what can be seen from the figure is that the self-efficacy of the participants is increasing (i.e., a trend) in Switzerland over time from T1 to T3.



Qualitative results

No qualitative results can be reported based on the questionnaire, meetings and emails/phone calls.



3.6 Willingness to pay

The willingness to pay was mostly measured in the Netherlands, because in Switzerland and Romania the questionnaire evoked distrust and scepticism. In Poland only the first measurement was done. Below you can see the different options that participants could choose from.

Option 1 – Standard membership:

Items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items.

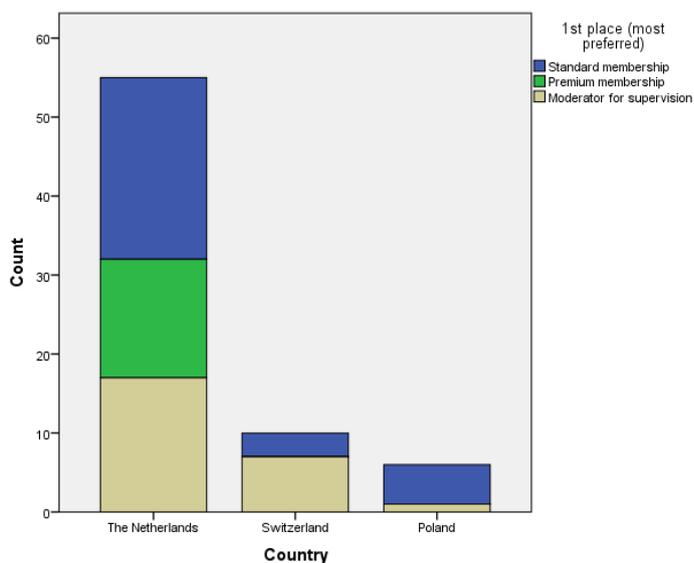
Option 2 – Premium membership:

The standard membership, but with the additional option to highlight your items so they are brought to the attention.

Option 3 – Moderator for supervision:

Items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items. There is a moderator actively involved in the

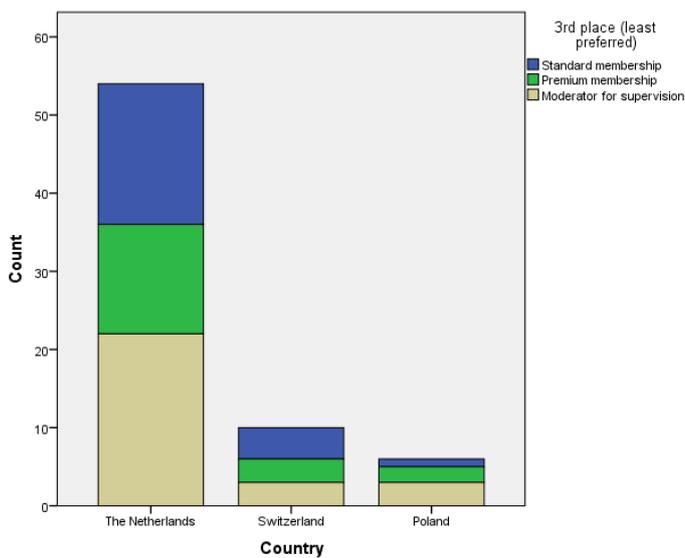
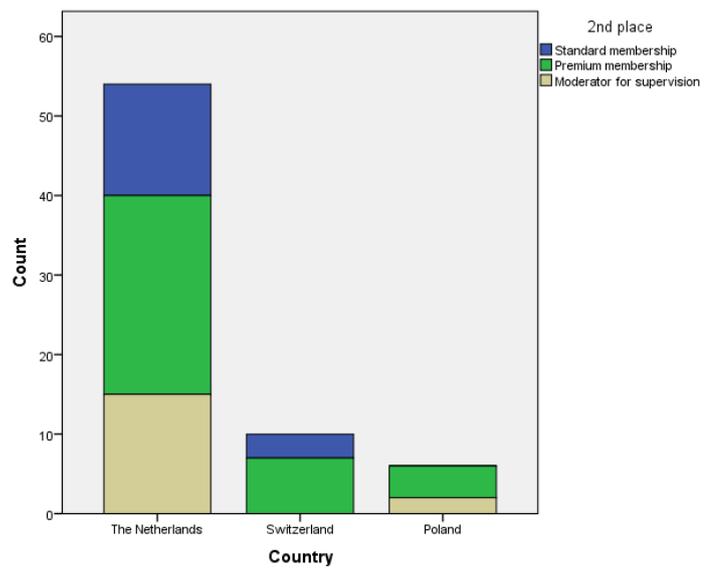
Question 1 | Place the three options in the order of your preference.



In The Netherlands, most participants preferred the Standard membership (option 1) on the first place, although the differences are small. In Switzerland option 3 was most preferred and in Poland also option 1.



Most participants in The Netherlands placed the Premium membership (option 2) on the second place, just as the participants from Switzerland and Poland.



The Moderator for supervision was placed on the 3rd place by most of the participants in The Netherlands, although the difference between the Standard membership is small. In Switzerland and Poland, the differences were also relatively small.



In respect to the amounts that participants were willing to pay for the different memberships one single time or monthly are presented in the tables below. Prices in Bold are highest for the specific country.

Question 2 | What are you prepared to pay (one single time) for using the platform? Pick an amount between €0,- en €100,-

Means (<i>M</i>) with Standard Deviations (<i>SD</i>)	The Netherlands (<i>n</i> = 44)	Switzerland (<i>n</i> = 10)	Poland (<i>n</i> = 6)
Option 1 – Standard membership	<i>M</i> = € 11,30 (<i>SD</i> = 2,10)	<i>M</i> = € 18,10 (<i>SD</i> = 6,30)	<i>M</i> = € 5,83 (<i>SD</i> = 5,83)
Option 2 – Premium membership	<i>M</i> = € 15,89 (<i>SD</i> = 2,10)	<i>M</i> = € 29,50 (<i>SD</i> = 8,96)	<i>M</i> = € 14,33 (<i>SD</i> = 6,74)
Option 3 – Moderator for supervision	<i>M</i> = € 17,43 (<i>SD</i> = 3,28)	<i>M</i> = € 42,00 (<i>SD</i> = 11,91)	<i>M</i> = € 10,67 (<i>SD</i> = 5,27)

Question 3 | What are you prepared to pay monthly for using the platform? Pick an amount between €0,- en €100,-

Means (<i>M</i>) with Standard Deviations (<i>SD</i>)	The Netherlands (<i>n</i> = 44)	Switzerland (<i>n</i> = 10)	Poland (<i>n</i> = 6)
Option 1 – Standard membership	<i>M</i> = € 3,32 (<i>SD</i> = ,48)	<i>M</i> = € 3,50 (<i>SD</i> = 1,50)	<i>M</i> = € 1,83 (<i>SD</i> = 1,83)
Option 2 – Premium membership	<i>M</i> = € 3,34 (<i>SD</i> = 0,57)	<i>M</i> = € 8,10 (<i>SD</i> = 2,57)	<i>M</i> = € 4,08 (<i>SD</i> = 2,11)
Option 3 – Moderator for supervision	<i>M</i> = € 4,36 (<i>SD</i> = ,67)	<i>M</i> = € 14,70 (<i>SD</i> = 5,24)	<i>M</i> = € 3,75 (<i>SD</i> = 2,15)

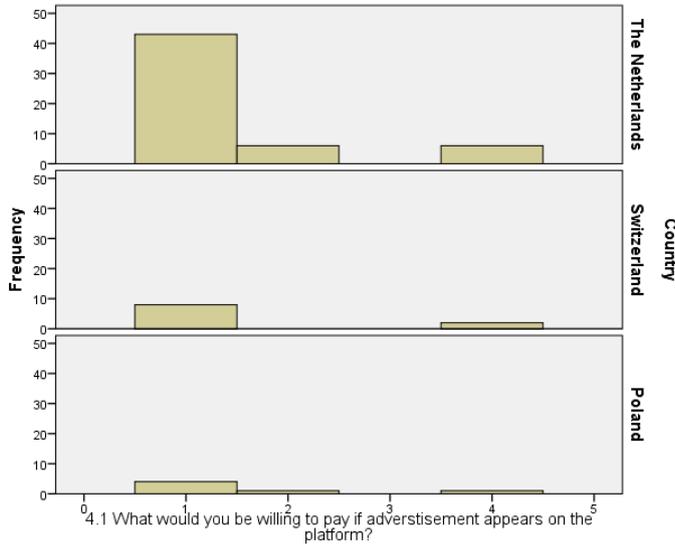


Question 4 | Several situations that can influence your willingness to pay for the Palette platform are described below.

Participants had the following answer categories:

1 = I would want to pay less | 2 = I would want to pay the same | 3 = I would want to pay more | 4 = I don't know

4.1 What would you be willing to pay if advertisement appears on the platform?

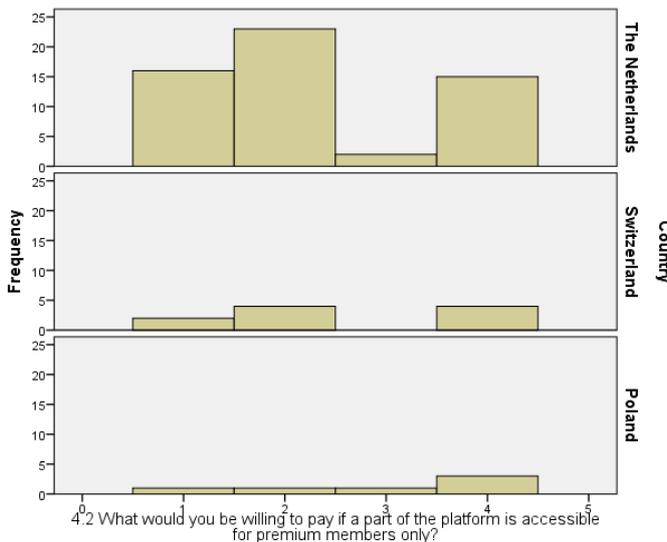


From the figure it appears that in The Netherlands, Switzerland and Poland, most participants want to pay less whenever there is advertisement on the platform.

Participants had the following answer categories:

1 = I would want to pay less | 2 = I would want to pay the same | 3 = I would want to pay more | 4 = I don't know

4.2 What would you be willing to pay if a part of the platform is accessible for premium members only?



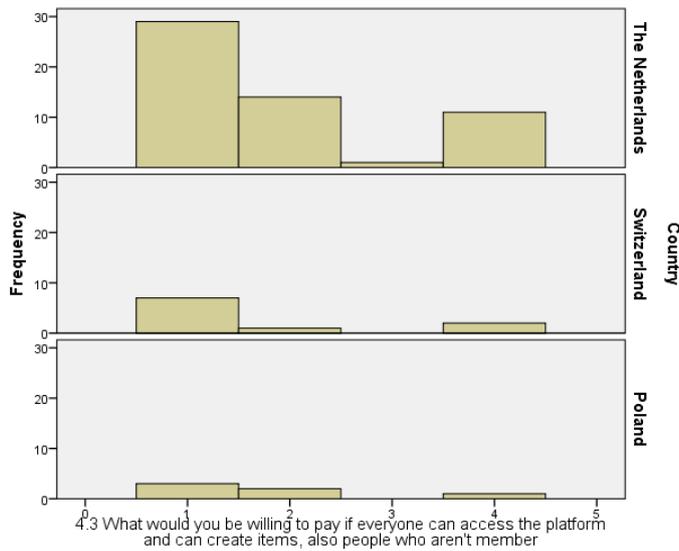
The figure shows that most participants want to pay the same or more whenever the platform is accessible for premium members only.



Participants had the following answer categories:

1 = I would want to pay less | 2 = I would want to pay the same | 3 = I would want to pay more | 4 = I don't know

4.3 What would you be willing to pay if everyone can access the platform and can create items, also people who aren't member.

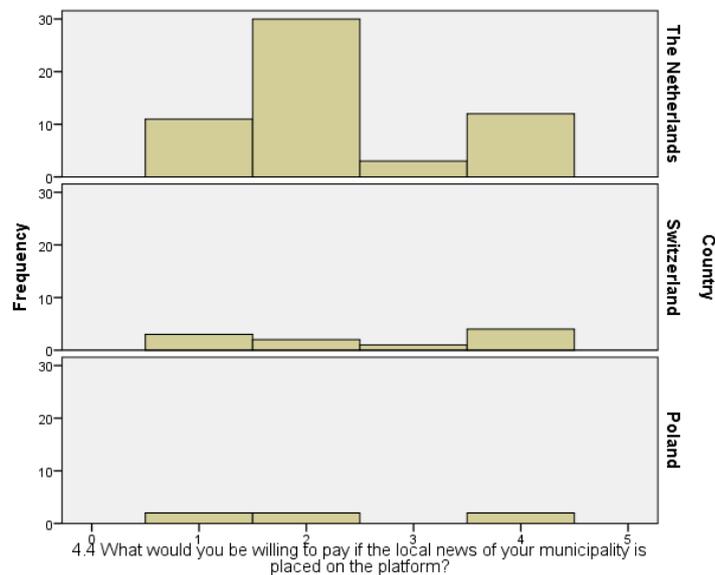


The results show that participants want to pay less or the same, whenever other people who are no members can create items and have access to the platform.

Participants had the following answer categories:

1 = I would want to pay less | 2 = I would want to pay the same | 3 = I would want to pay more | 4 = I don't know

4.4 What would you be willing to pay if the local news of your municipality is placed on the platform?



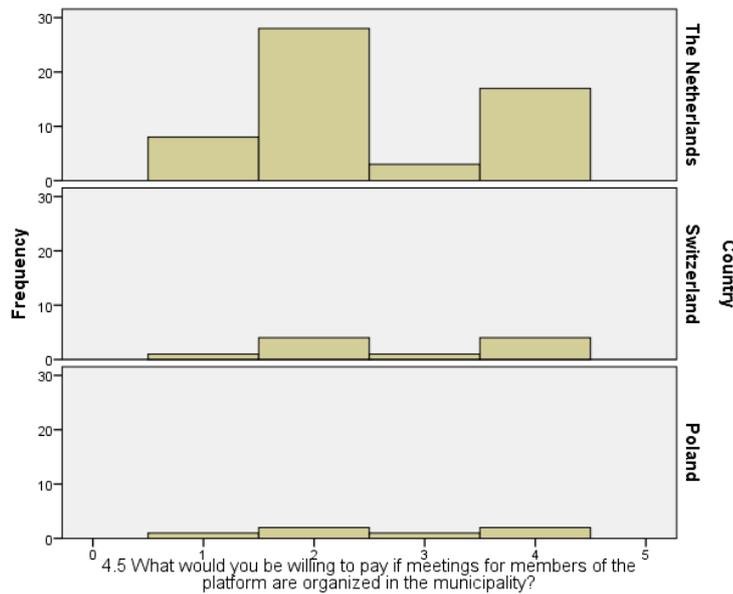
The figure shows that most participants want to pay the same amount whenever local news from the municipality is placed on the platform.



Participants had the following answer categories:

1 = I would want to pay less | 2 = I would want to pay the same | 3 = I would want to pay more | 4 = I don't know

4.5 What would you be willing to pay if meetings for members of the platform are organized in the municipality?



Again, most participants would pay the same amount if meetings for members of the platform are organized in the Municipality.

Qualitative results

Multiple participants remarked that it was a bit soon to judge about the value of Palette, because they only used it for a while and it wasn't in full use yet and that the value depends on the broadness of the offer. But a lot of participants were clear about the fact that seniors shouldn't be the ones paying for the platform:

"Such a platform should not be paid, seniors do not have money for such things." (Participant from Poland)

"I'm against paid membership. It should be accessible for everyone. A single payment is no problem, unless it's affordable." (Participant from the Netherlands)

"I think it should become a modern facility of the municipality and then using it should be free, especially in the beginning." (Participant from the Netherlands)

Although the questionnaire wasn't applied in Romania, the researchers did talk to the leader of a senior organization. He told the researchers that most seniors in Romania have financial issues and wouldn't pay for any technology or service.

A lot of participants in the Netherlands think Palette should be paid by senior organizations or the municipality and that the municipality also has a task in making the platform accessible to all citizens by offering the right conditions and support.



4. Discussion

In this section, we will elaborate the most important findings. First, we distinguish different types of users and stakeholders. Secondly, we discuss the results on the various outcome measures (i.e., the main results). Third, we say something about the limitations of the study. Then we share our most important lessons learned and lastly, we sum up the points for further technical improvement.

4.1 Types of users/stakeholders

During Alpha and Beta, we started to distinguish different types of users, who have different needs and demands and therefore should be serviced differently by the platform. This of course is not a complete picture, but it illustrates that there are certain conditions that need to be met to make a platform succeed. Moreover, people's lives and their needs and preferences regarding Palette can change over time.

Table 4.1 Types of users and stakeholders

Type of user	Description/Use of the platform	Requirements/needs
Seniors that are computer illiterate/ computer novice	<p>This group is not digitally skilled. Some of them have no email address, they have difficulty to use a QWERTY keyboard and mouse.</p> <p>Logging in to the platform is difficult, as well as understanding the routing/ infrastructure of an online platform like Palette.</p> <p><i>"I am 73 and cannot work with it independently"</i> (Participant from the Netherlands, Alpha test)</p>	<p>This group would benefit from offline meetings to help them to get to know their way around the platform.</p> <p>Some of them see using Palette as a way to improve their digital skills. Offline meetings could be beneficial to learn to use computer and the Internet.</p>
Seniors that (just) want to participate in activities	<p>This group is somewhat digitally skilled. They sometimes have some doubts about safety on the Internet. Some of them feel reserved to try things on the internet, in fear of making mistakes. They are interested in the concept and want use the platform to meet people and find activities. They don't want to organize events themselves.</p> <p><i>"There should be more events and users, maybe there should be a one person from each senior club to share events they are organizing"</i> (Participant from Poland, Alpha test)</p>	<p>The platform has to be a lively place with a wide variety of offers. These seniors want a clear overview and feedback from the system that they see the entirety of offers. For them, the platform could be a place where all activities in the municipality or area are gathered. Also, this group would like to see more possibilities to offer and ask for services and help (for example a ride to the hospital).</p> <p>They need to feel that the platform is trustworthy. One way of guaranteeing that Palette is a safe place, is the active role of a moderator. In this case, the moderator could be someone in the municipality that is also available for questions (by phone or by e-mail).</p>



Seniors that are active and want to offer events	This is a group of seniors that is active and want to help others, invite others to join activities they already participate in or offer services that they organize. They are often a bit more digitally skilled than previous seniors. A lot of them proved to be helpful in explaining the platform to fellow seniors.	The platform should be easy to use with an open infrastructure. They need feedback from the system that they successfully placed their items and want to be sure that users get to see their offer. For people that want to offer multiple activities, it is important that they can quickly and easily publish and review items. Also, it should be possible to create events without a clear beginning and end date or specific time.
Seniors that have an active (social) life and are too busy	This group of seniors is so active and have such a busy schedule that they don't feel the need to use a platform like Palette. They don't really have to offer something, and they don't need to use it to have social contacts and participate in activities. <i>"I think the idea and execution are fine, and still I don't use it. I have internet messages enough and I'm busy with all kinds of things. Because of that, Palette doesn't add anything for me (yet?)"</i> (Respondent from The Netherlands, Beta test)	If the platform would be a place where every activity in the municipality is placed, they would use the platform as an online agenda (which replaces the activities displayed in the local newspaper).
People who want to offer services or activities that are part of organizations.	This can be people from volunteer organizations, sports clubs or the municipality itself. They are not necessarily seniors.	Efficiency is key for this group. It should be easy to place series of activities. Also, the comments and registrations must be visible in a clear overview or list. It should be possible to compare the quality of own items to others. It is important that they can easily reach the seniors that participate in their events.
Moderator	Someone who monitors the use of the platform and makes sure the platform is a safe and friendly environment. The moderator receives messages if anything is marked as inappropriate content and has to take action. The moderator could also have a more active role to help people, send messages to users if they should improve their events (for example to clarify the information given), connect people or help them find activities that would match their needs. Also, the moderator could have a more offline function in organizing meetings, helping people with the internet in general and Palette specifically. They could function as a help desk.	For a moderator it is important that he or she has a good overview of the whole platform. They should be able to act if someone places inappropriate content, for example by inactivating their account. The system must support this by facilitating the moderator to easily get in contact with the reporter of the inappropriate content.
Municipality	For the municipality Palette is a service they would like to offer to their citizens. They could use it as a platform to collect all	



activities that take place. Also, they could use it to strengthen the social cohesion.

Senior club / care cooperation	These organizations want to facilitate their members to help each other, to get in touch with each other easily and to strengthen the social cohesion in their organization.	Palette needs to be a closed environment, possibly secured with a password, so only members can log in and use the platform.
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This overview illustrates that you need different kinds of users to make a platform like Palette work. Without active users, there is not enough offer on the platform, but without seniors who only want to look around and participate you wouldn't have many participants of the events that are organized. In the development of the platform the focus was more on the active seniors than on for example organizers, moderators or municipalities. They have different requirements like overview and efficiency. A large group of seniors that participated in the Alpha and Beta were part of the group that wants to participate but do not want to offer activities themselves. As a result, some of them thought there was not much happening on the platform.

4.2 Discussion on main results

Usability

Overall, the results show that Palette is highly useable and liked and desired by the intended end-user group (seniors around their pension age) because of the colours, the beauty of the design, accessibility, and the easy of use. The quantitative usability results showed that the usability is high and positive, and that the usability positively increased from Alpha to Beta, indicating that Palette was successfully enhanced in respect to usability. It should be noted that seniors faced many difficulties in the registration phase, which is too complicated and should be reduced in complexity in a market version of Palette, e.g., with a predefined token or registration via a telephone. Apple users and seniors that were using a tablet also faced difficulties with Palette, which should be fixed by more responsive designs and compatibility with the iOS platform. It should also be noted that some seniors felt bored after using Palette, mostly due to limited users and events, which can be solved by scaling up. Finally, seniors were quite effective in performing the tasks, with an effectiveness score above 70%.

Technology Acceptance

Similar to the results on usability, most seniors accepted Palette and the results were positive. It should be noted that the acceptance of Palette was relatively low during the Alpha phase for the Dutch seniors. Yet, overall, the scores were all very positive. Effort Expectancy was relatively low for the seniors from The Netherlands during the Beta testing phase, which was (again) likely caused by the complicated registration phase with multiple steps and email confirmation that did not work or arrived in the mailboxes of the seniors (see also the results on usability). Facilitating Conditions were also rated significantly lower during the Beta phase than during the Alpha phase, again possibly caused by the additional functionalities and complicated registration phase. It is interesting to note that there was a huge difference between the Habit ratings for The Netherlands between Alpha and Beta, and significantly between The Netherlands and the other 3 countries. Seniors during Alpha testing in The Netherlands used Palette in a controlled setting (not at home), which reflects in these Habit ratings, i.e. Palette will not become a habit or natural whenever you use it in a 2-hour timeframe.



Social connectedness

The dataset was too scattered and incomplete to perform statistical tests on social connectedness. Also, because the datapoints differed between groups and countries that participated in the Beta tests. Nevertheless, some seniors were highly positive about the possibilities that Palette offered to them in meeting peers in their neighbourhood. As noted before, one significant result is that a group of seniors from the Beta test in the Netherlands (Sint-Oedenrode) reported that they managed to organize a (social) event through Palette and they really enjoyed it.

Willingness to pay

The willingness to pay was mostly measured in the Netherlands, because in Switzerland and Romania the questionnaire evoked distrust and scepticism. Standard membership was most preferred by the seniors, which implies that items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items. Seniors from The Netherlands and Switzerland were willing to pay the highest amount for Palette one single time (€ 17,43 NL; € 42,00 CH) and monthly (€ 4,36 NL; € 14,70 CH) for the option with a moderator for supervision. The seniors from Poland were willing to pay most for the premium membership. Advertisement was not preferred, since most seniors want to pay less whenever there is advertisement on the platform. Seniors want to pay the same or more whenever the platform is accessible for premium members only and want to pay less or the same, whenever other people who are no members can create items and have access to the platform. Interestingly, seniors want to pay the same amount whenever local news from the municipality is placed on the platform and if meetings for members of the platform are organized in the municipality. This is likely related to the Dutch situation in which municipalities are responsible via the Social Care Act (WMO 2015) to finance services and technologies that support the well-being of the inhabitants of the municipality.

4.3 Limitations of the study

In the Netherlands, the Beta study took place during the months of December and January. We expect that this timing had a negative effect on the involvement of the participants. The holiday season brings many obligations and often is a very busy time which left participants with less time for the user study. A direct result might be the low amount of T1 measurement results that we received.

For the Beta study we asked participants to fill in a questionnaire consisting of 6 different questionnaires, which each were of considerable length. We expect that the amount of time required per participants to fill out all questionnaires might have reduced the amount of fully completed questionnaires.

In the Beta study in the Netherlands, users were given a set of tasks, which were explained on a step-by-step basis. We were able to assess whether people were able to fulfil these tasks such as 'create profile' 'create event' within a set time. However, we were not able to distinguish if users were able to do this autonomously, or if they could only fulfil these tasks due to the direct instructions of the workshop hosts. 'Did our participants have a conception of the actions they were performing?'



4.4 Lessons learned regarding the process

During the iterative end user testing, we learned some important lessons regarding the process. Sharing these lessons learned and corresponding recommendations can help other projects or further research.

1. *Bring a clear message*

A lot of seniors are not that familiar with internet platforms, so it is important to give a clear explanation, but in particular be transparent and explicit about the use of personal data. Seniors are otherwise concerned about privacy issues.

2. *See the importance of having a variety of stakeholders*

To kick off a platform like Palette, you will need different types of stakeholders and users. There are for example the need for a municipality or big senior club that cooperates, the need for different kinds of senior end users and one needs to think about online and offline roles of key figures like moderators. It is recommended to involve more large-scale parties that are willing to create events for the senior users. This can also forestall that nothing is happening on the platform, if these parties are willing to produce events for the senior users. Palette was mostly targeting senior and users, but other stakeholders have different requirements. Taking this into account might mean that different kind of mock-ups should be made, with a diversity in the types of offer.

3. *Involve those stakeholders in all stages of the process*

We involved the senior end user in every step of the co creation process and the evaluation in the Alpha and Beta study. In The Netherlands, some important stakeholders within the municipalities were only involved in a later stage of the process. As a result, we encountered some problems in the municipality of Oisterwijk and had to do a controlled test instead of an in-situ Beta test.

4. *Seniors might need offline meetings*

We encountered some seniors who really needed help to find their way on the platform. During the Alpha study, some seniors reported that they would like to use Palette to develop their computer skills and learn to use the internet. Offline meetings helped them to get started. These meetings might be important for seniors who are not that accustomed to using computers and social platforms like Palette.

5. *Think about offline roles*

In addition to the meetings mentioned above, we noticed that the importance of a moderator should not be underestimated. They can function as a helpdesk and mostly give a sense of safety on the platform.

6. *Take in account that it takes effort to learn*

During the Alpha and Beta study, we heard multiple times that it takes effort (and for some seniors a lot of effort) to learn to use a platform like Palette. Some participants questioned if it was worth the effort of learning to use it, especially when it has not yet proved to be helpful. Clear information about the added value might help.

7. *Don't overestimate the digital skills of the target group*

Despite the fact that end users were involved in most of the iterative user testing, we might have overestimated the skills of the seniors in some aspects. For example, some of them did not know how



to get to their e-mail or forgot their password, which resulted in a long and difficult process of logging into the platform. Also, some seniors have difficulties using a mouse and a keyboard, which complicates using Palette, especially when a series of actions is needed (like when creating an event). Another observation was that seniors had difficulties with understanding the concept of the platform and especially the routing through the website. Some seniors did not seem to understand the causes and effects when clicking through Palette.

8. *Be culture sensitive*

In some countries, the willingness to pay questionnaire was too intrusive or it evoked distrust against the platform as they felt something was being sold to them. For example, in Romania, a lot of seniors have financial issues. Because of that, some countries decided to stop sending out this questionnaire. Also, for example in the Netherlands, most people have their own tablet or computer and an email address, while in Romania this isn't the case. The same applies to understanding the concept of the platform: in the Netherlands some seniors could relate to other websites like Facebook or websites in their municipality. This doesn't apply for all countries. Another difference in culture is that seniors in Romania are used to interacting mostly with family and neighbours. The ones participating in the Alpha and Beta testing were part of senior organizations and were outgoing. However, meeting strangers through an online platform seemed a bit far-fetched for them. It is an activity that doesn't seem natural to them. They would need to see or hear about more people their age doing it in order for them to try it. For example, in The Netherlands, it proved to be less of an issue when eight people got together to visit a museum.

9. *Paying to use a platform like Palette might be one bridge too far*

As said in the paragraph above, paying for a platform like Palette is not an option for senior with money issues. But also, seniors that do not have those issues with money, feel that they should not individually pay for a platform like this. The municipality or (care/seniors) organizations should be responsible for the costs as it should be a service that they offer to seniors.

10. *Consider giving more substance to the platform*

Some seniors expected the platform to contain all the events that are happening in their city or municipality. For them it was not entirely clear that they should create the content themselves. We also observed that it can be discouraging to use the platform when there is not enough offer and not much is happening. Some participants even asked if the test was still going on. At some point several experimenters decided to create events themselves or asked key figures to create content. It's recommended that stakeholders are involved in an early stage, so that the platform is already an attractive and lively place when people start to use it.

4.5 Points for further technical improvement

During impact testing in Alpha and Beta, we encountered some issues in Palette. Small bugs were immediately solved by the technical partners, but some issues were more complex and needed to be discussed. During the last face to face meeting in January 2019 we listed the remaining points for improvements and prioritized them. Some of them are implemented in the meantime (for example show four relevant items in the first page). To see what has been improved, see D.4.3.



Table 4.2 – Listed requirements for improvement

Requirement	Priority	Effort	Hours
Create profile: give users the option to view their password	High	1	4
Recurring events	High	5	40
Publish items in both My Palette and Palette offer	High	4	8
Add html layout for notifications	High	3	24
Palette offer - add 4 relevant items in the first page	High	5	8
Profile - add field for code	High	5	24
- links for actions in email	High	3	8
- new actions for moderator	High	3	40
Replace "Become member" button from home page with "Try Palette" button	Low	1	2
Change the layout of that page	Low	3	8
Update Activity section from profile: add a new line "User X is organizing Y items"	Low	2	4
Add a button for scrolling in profile pages	Low	4	16
FAQ improvements	Low	2	16
- remove some options (It is pornography)	Low	1	1
Enlarge/clarify pagination buttons	Medium	1	1
Add more options to distance filter: 1 and 2 km	Medium	1	1
Add "Optional" label for create profile optional fields	Medium	1	1
Change color for type filters	Medium	1	2
Clock has a difficult interface - it should be replaced with something else?	Medium	5	24
Create profile: remove second tab (Complete profile)	Medium	2	2
Update profile	Medium		
- first tab: add picture at the top	Medium	2	4
- remove second tab(Complete profile)	Medium	2	2
- rename Summary tab to "Privacy settings"	Medium	1	1
-"Do you want the others to see the items you are attending?" - enabled by default	Medium	2	1
Content moderation	Medium		
- send email and notification for each action	Medium	3	4

Below we will highlight some of these requirements:

Some of the requirements have to do with making it easier for seniors to log into the platform. During testing we noticed that a lot of seniors struggled with the process of creating an account and that it took most of them at least ten minutes to go through that process: they had to make a profile, create a password, receive an email and then get back to the platform to log in. Requirements that should help seniors with this process are to give them an option to view their password, to remove some tabs from the 'create profile' page and add optional labels for the optional fields on the 'create profile' page. Also, some things should be more transparent and easier, like enable others to see the items you are attending and have a tab 'privacy settings'. Ideally, creating an account and logging in should be even easier and without an extra step of receiving an email.

An important requirement is to make the homepage overview clearer. Because it is difficult to create recurrent events or create events without a specific start date, the 'offer page' is populated with events that have start dates that are in the past (see figure 4.1). One way to solve that is to add four relevant items in the first page. This would make the offer page look more attractive, instead of cluttered with items that seem to have already



taken place. Ideally, it is easier to create events that have no particular start date, or to create recurrent events of which the past editions disappear automatically from the 'offer page'.

For end users it was difficult to understand that the events they created were displayed in the 'my palette' page, and not in the overview on the 'offer page' (see figure 4.2). We tried to help end users with that by sending tips, but it seems a bit counter intuitive to not see your own event on the 'offer page'. For usability it would be important to improve this point and make sure that the event created is showed in both 'Palette offers' and 'My palette'.



Figure 4.1 Events in the past





Figure 4.2 Palette offers and My Palette

Because end users reported that a moderator is important to make sure the platform is a safe place, there should be some specific functionalities for a moderator. They have to receive a clear message when something has been reported as inappropriate content, they should be able to see the reporter and the reported content easily and they have to be able to take actions, like inactivate an account. To give feedback to the person reporting as well as the person that has been reported, notifications or emails should be sent to them.

Lastly, we noticed that it is important to keep end users involved in using Palette. One way of doing that is to send them notifications by email. To do that effectively, it is important that the layout of the notifications is clear, inviting and trustworthy. The emails sent by Palette should contain for example the logo and some sort of signature so it is clear the message came from Palette.

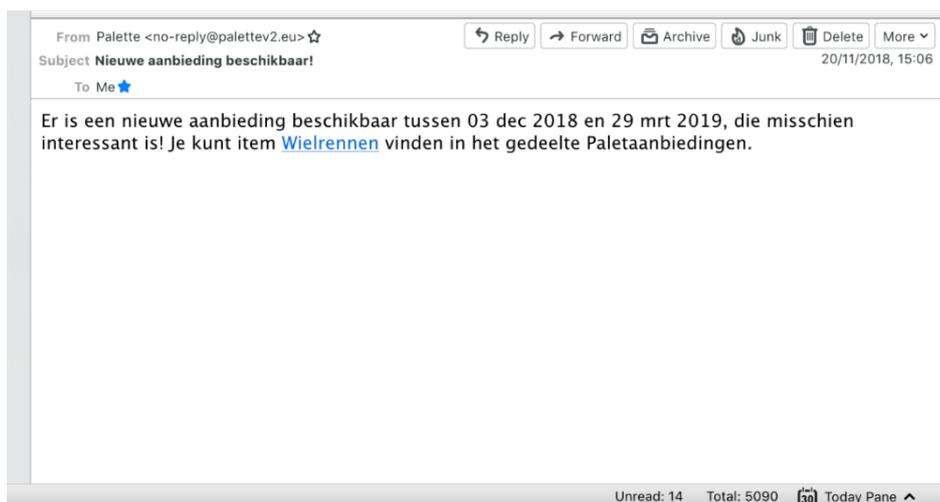


Figure 4.3 Example of email notification from Palette



5 Acknowledgements

We want to thank the participants in the four countries (Poland, Romania, Switzerland, and The Netherlands) for participating in the studies. In addition, we gratefully acknowledge the support from the European Commission AAL Joint Programme, in particular the support for the Palette project. Finally, we want to thank Lotte Cornelisse from Vilans for her lead in the co-creation phase, making Palette possible and wish her all the best.



6 Appendices

Appendix A: Guideline Alpha

The palette platform will be evaluated in alpha (1 month) and beta (4 months) testing in four countries; The Netherlands, Poland, Switzerland and Romania. This document gives an overview of the procedure of studies and a concept of the guidelines for alpha testing.

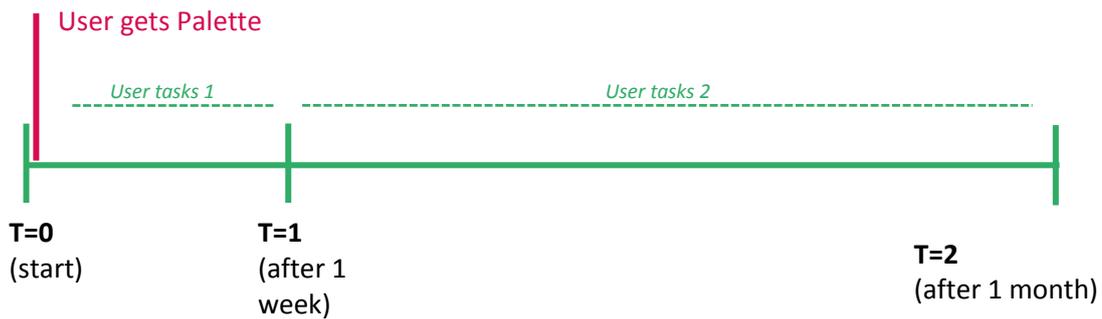
ALPHA

Participants

The participants of this evaluation do not have experiences with palette.

- NL: 20 participants
- PO: 10 participants
- Sw: 5 participants
- RO: 5 participants

Procedure



	Method	Measurements	When
T=0	Focusgroup	General Questionnaire Topic: Expectations about the platform	Week 34: 20 -24 aug
T=1	Online questionnaire	IBM UTAUT2 Desirability	T=0 + 1 week (week 35: 27-31 aug)
T=2	Online questionnaire	IBM UTAUT2 Desirability	T=0 + 4 weeks (week 38: 17-21 sept)
	Focusgroup	Topic: experiences with the platform	

System data

Per participant

- Number of logins in platform



- Number of items created
- Type of items created on palette
- Number of items viewed
- Number of items selected with attending

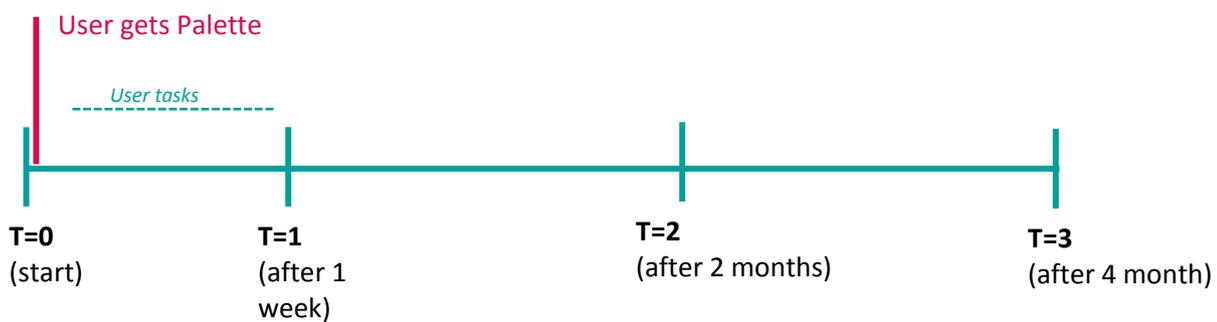
BETA

Participants

In beta both the participants from alpha testing and participants without experience will be included

- NL: 60 participants + 20 from alpha
- PO: 30 participants + 10 from alpha
- Sw: 20 participants + 5 from alpha
- RO: 20 participants + 5 from alpha

Procedure



	Method	Measurements	When
T=0	Online questionnaire	General questionnaire Questionnaire about expectations Willingness to pay – pre measurement	Week 40: 1-5 oct
T=1	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 1 week (week 41: 8-12 oct.)
T=2	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 2 Months (week 49: 3-7 dec)
T=3	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness Willingness to pay - post measurement	T=0 + 4 Months (week 5: 28 jan- 1 feb)

System data:



Per participant

- Number of logins in platform
 - Number of items created
 - Type of items created on palette
 - Number of items viewed
 - Number of items selected with attending
-

Guideline for Alpha testing

The alpha test is a one month test in which users will use the platform at home. In these guidelines you can find the information needed to prepare the test, including information about recruitment, the focus groups sessions (t=0 an t=2) and the questionnaires that should be filled in by the participants.

1| Recruitment.

In all countries participants (NL:20, PO:10, SW5, RO,5) must be recruited who do not have experiences with the platform palette and do live in the same neighbourhood or city.

2| T=0 Focus group

In each country, a focus group will be organized in week 34 (20-24 aug) for all participants. The goal of this meeting is to collect information about the expectations and to introduce the platform. The focus discussion can be done with 5-8 participants which means that in Poland and The Netherlands the group should be split and multiple researchers are needed.

Program of the session (2 hours)

- Introduction
- Focus group discussion about the expectations of Palette
- Create accounts for testing at home
- End of the meeting

Introduction

Start with an introduction about palette and the research to users' needs and wishes by using the presentation ([appendix C](#)). Ask participants and use the informed consent ([appendix A](#)) for permission to use data for research. Ask users to fill in the general questionnaire ([appendix B](#)). Let them know that the results of the user research will be used anonymous and that participation is not compensatory. Every participant can decide to stop anytime, also after signing the informed consent.

The focus group discussion:

In groups of 5-8 participants the following topics:

- what do you expect from this platform?
- What kind of items would be nice to attend by using this platform?



- How many times do you expect to use this platforms?
- For which situations you think that palette can and cannot help?
- At which moments do you think you will use palette?

Make use of flipovers and posters to collect the data and add the results in the format of results (appendix G).

Create accounts for testing at home

Let users create their account for palette. First observe if they are able to create an account themselves, and – only if necessary – help them with this, in order to ensure that they can start using palette at home.

- ___ Click become a member of palette
 - o One on top
 - o In the middle
 - o One at the bottom
- ___ Create profile
- ___ types in name
- ___ types in last name
- ___ types in email
- ___ types in email
- ___ types in password
- ___ types in phone number
- ___ Fill in country
 - o Select a country
 - o Types in country
 - o Combination of typing and selecting
- ___ Fill in city
 - o Select a city
 - o Types in city
 - o Combination of typing and selecting
- ___ Check-box agree with privacy policy
- ___ Click on next
- ___ Select year of birth
- ___ Select gender
- ___ Click next
- ___ Selects interest
 - o only one
 - o multiple interests
- ___ click next
- ___ Start using palette

Write down any problems that occur and questions you got from the users. Collect from each user the email address they use for the account.

End of the meeting

Thank the users for participating and present the next steps (appendix C). explain that they will get a questionnaire by mail after one week and after one month. In case users do not want to receive online questionnaires give them a printed versions and envelope with the address of the research institute to send



it to after one week. The second questionnaire (t=2) can then be filled in after the second focus group session at the end of the alpha test. Finally give the users the user tasks card with they can use during testing ([appendix E](#)) and thanks them for participating.

3| T=1 Questionnaire

In week 35 (27-31 aug) an online questionnaire will be sent to all participants. After 4 days a reminder will be sent to users who did not respond. In the questionnaire IBM, UTAUT2 and Desirability are used. ([appendix D](#))

4| T=2 Questionnaire & focusgroup

In week 38 (17-21 sep) an online questionnaire will be sent to all participants. After 4 days a reminder will be sent to users who did not respond. In the questionnaire IBM, UTAUT2 and Desirability are used. ([appendix D](#))

A focus group will be organized in week 38 (17-21 sep) for all participants. The goal of this meeting is to collect information about the experiences. The focus discussion can be done with 5-8 participants which means that in Poland and The Netherlands the group should be split and multiple researchers are needed.

Program of the session (2 hours)

- Focus group discussion about the experiences of Palette
- End of the meeting

Focus group discussion

In groups of 5-8 participants the following topics:

- what are the experiences with the platform both positive and negative and why?
- Do you have any suggestions for improvements?
- What kind of items are nice to attend by using this platform and why?
- How many times did they use the platform and why?
- For which situations you think that palette can and cannot help and why?
- At which moments did you use palette and why?
- would you advise to use the platform to others? Why or why not?

Make use of flipovers and posters to collect the data and add the results in the format of results ([appendix F](#)).

End of the meeting

Thank the users for participating, give them a gift card. Also invite them for the beta test. (information about this test will follow after the consortium meeting.

Ask users that did not make use of the online questionnaire to fill in the t=2 question air on paper.

Appendices¹⁷

¹⁷ For all appendices belonging to the Alpha guideline, see Deliverable 5.2.



A informed consent
B General Questionnaire
C presentation for the focus group session 1
D online questionnaire
E user tasks
F Format for results
G instruction how to install google chrome



Appendix B: Questionnaires Alpha

General questionnaire

1 GENERAL

1.1 Date of birth: _____

1.2 Place of residence: _____

1.3 Gender

- Male
- Female

1.4 What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

- ...
- ...

2 WERK

2.1 Are you already retired?

- Yes
- No

2.2 Which of the following work situations applies to you? (Multiple answers possible)

- Working (payed job)
- working (voluntary work)
- looking for a job
- none of the above situations

3 COMPUTER USE

3.1 Frequency of use

- Every day
- Once in a week
- Once a month
- I have tried a Computer one or two times, don't regularly use it
- No experience (skip 3.2 and 3.3)

3.2 Perceived skill level

- Not very skilled
- Not skilled
- Neutral
- Skilled
- Very skilled

2.9 Which PC programs do you use?

3.4 Experiences with other technology

- I do have a cell phone/ smartphone and use it never/sometimes/ regularly/ often
- I do have a cell tablet/ipad and use it never/sometimes/ regularly/ often



Questionnaire user experience

Welcome

You performed a number of tasks with the palette platform. This questionnaire gives you an opportunity to tell us your reactions to the Palette platform you used. Your responses will help us understand what aspects of the Palette platform you are particularly concerned about and the aspects that satisfy you.

Your answers will be used anonymously for the Palette project. If there is a question feel free to contact the one of the researchers

Question 1 | Choose three words that fit your experience with palette

Accessible	Desirable	Gets in the way	Patronizing	Stressful
Appealing	Easy to use	Hard to use	Personal	Time-consuming
Attractive	Efficient	High quality	Predictable	Time-saving
Busy	Empowering	Inconsistent	Relevant	Too technical
Collaborative	Exciting	Intimidating	Reliable	Trustworthy
Complex	Familiar	Inviting	Rigid	Uncontrollable
Comprehensive	Fast	Motivating	Simplistic	Unconventional
Confusing	Flexible	Not valuable	Slow	Unpredictable
Connected	Fresh	Organized	Sophisticated	Usable
Consistent	Frustrating	Overbearing	Stimulating	Useful
Customizable	Fun	Overwhelming	Straight Forward	Valuable

Question 2 | explain why you choose these words.

Question 3 | To as great a degree as possible, think about all the tasks that you have done with the Palette platform while you answer the following questions. Please read each statement and indicate how strongly you agree or disagree with the statement by circling a number on the scale. If a statement does not apply to you, circle N/A.

1. Overall, I am satisfied with how easy it is to use the Palette platform.

strongly
agree

1

2

3

4

5

6

7

strongly disagree

N/A



2. It was simple to use the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

3. I could (effectively) successfully complete the tasks and scenarios using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

4. I was able to complete the tasks and scenarios quickly using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

5. I was able to efficiently (quickly) complete the tasks and scenarios using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

6. I feel comfortable using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

7. It was easy to learn to use the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

8. I believe I could become productive quickly using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

9. The Palette platform gave error messages that clearly told me how to fix problems.



strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

10. Whenever I made a mistake using the Palette platform, I could recover easily and quickly.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

11. The information (such as online help, on-screen messages, and other documentation) provided with the Palette platform was clear.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

12. It was easy to find the information I needed.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

13. The information provided for the Palette platform was easy to understand.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

14. The information was effective in helping me complete the tasks and scenarios.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

15. The organization of information on the Palette platform screens was clear.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----



Note: *The interface includes those items that you use to interact with the Palette platform. For example, the language, buttons, text-boxes, etc.*

16. The interface of the Palette platform was pleasant.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

17. I liked using the interface of the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

18. This Palette platform has all the functions and capabilities I expect it to have.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

19. Overall, I am satisfied with the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

20. List the most negative aspect(s) of the Palette platform and/or interface:

1.
2.



3.

21. List the most positive aspect(s) of the Palette platform and/or interface:

1.

2.

3.

Please read each statement and indicate how strongly you agree or disagree with the statement.

	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
Performance Expectancy							
PE1. I find palette useful in my daily life.							
PE2. Using palette increases my chances of achieving things that are important to me.							
PE3. Using palette helps me accomplish things more quickly.							
PE4. Using palette increases my productivity.							
Effort Expectancy							



EE1. Learning how to use palette is easy for me.							
EE2. My interaction with palette is clear and understandable.							
EE3. I find palette easy to use.							
EE4. It is easy for me to become skillful at using palette.							
Social Influence							
SI1. People who are important to me think that I should use palette.							
SI2. People who influence my behavior think that I should use palette.							
SI3. People whose opinions that I value prefer that I use palette.							
Facilitating Conditions							
FC1. I have the resources necessary to use palette.							
FC2. I have the knowledge necessary to use palette.							
FC3. palette is compatible with other technologies I use.							
FC4. I can get help from others when I have difficulties using palette.							
Hedonic Motivation							
HM1. Using palette is fun.							
HM2. Using palette is enjoyable.							
HM3. Using palette is very entertaining.							
Habit							



HT1. The use of palette has become a habit for me.							
HT2. I am addicted to using palette.							
HT3. I must use palette.							
HT4. Using palette has become natural to me.							
Behavioral Intention							
BI1. I intend to continue using palette in the future.							
BI2. I will always try to use palette in my daily life.							
BI3. I plan to continue to use palette frequently.							



Appendix C: Guideline Beta

The palette platform has been evaluated in alpha testing (1 month), and will be further evaluated in beta testing (2,5 months) in four countries: The Netherlands, Poland, Switzerland and Romania. This document gives an overview of the procedure of studies and a concept of the guidelines for beta testing.

BETA

Participants

In beta both the participants from alpha testing and participants without experience will be included

- NL: 60 participants + 20 from alpha
- PO: 30 participants + 10 from alpha
- Sw: 20 participants + 5 from alpha
- RO: 20 participants + 5 from alpha

Procedure



	Method	Measurements	When
T=0	Online questionnaire	General questionnaire Questionnaire about expectations Willingness to pay – pre measurement	T=0
T=1	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 1 week
T=2	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness	T=0 + 6 weeks
T=3	Online questionnaire	IBM UTAUT2 Desirability Self-efficacy Social Connectedness Willingness to pay - post measurement	T=0 + 2,5 months (Week 5: 28 jan – 1 feb)



System data:

Per participant

- Number of logins in platform
 - Number of items created
 - Type of items created on palette
 - Number of items viewed
 - Number of items selected with attending
-

Guideline for Beta testing

The beta test is a three month test in which users will use the platform at home. In these guidelines you can find the information needed to prepare the test, including information for participants and the questionnaires that should be filled in by the participants.

1| Recruitment

In all countries participants (NL: 80, PO: 40, SW: 25, RO 25) for beta testing, must be recruited who live in the same neighbourhood or city.

2| Preparation

Appoint a contact for the participants, so they know where they can ask questions. Also appoint a moderator who checks the platform regularly (once or twice a week), to make sure there are no users that are not participants in the beta test and that the platform is a safe and friendly environment for the participants. Try to ensure there are some active users on the platform, so that there is enough interesting content. The moderator can have a role in this, for example by creating items.

3| T=0 Introduction and online questionnaire

In each country, participants will get an e-mail with all the information needed about Palette ([appendix A](#)). Content of the e-mail is a general introduction and information about the evaluation, an instruction for installing Google Chrome, and the user tasks ([appendix B](#)). The general questionnaire ([appendix C](#)) - including the questionnaire about expectations - and the willingness to pay questionnaire ([appendix E](#)) can be sent in this e-mail or can be offered by an online tool.

4| User tasks

To keep the users involved with the platform, every week/every two weeks a reminder with the user tasks ([appendix B](#)) for that week can be sent by e-mail.

5| Meetings

The beta test only takes place online, but according to the scale of the test and the demand for support in your country, you can organise a meeting to answer questions and use the platform in a group setting.

6| T=1 Online questionnaire



One week after the start, an online questionnaire about user experiences will be sent to all participants. After 4 days a reminder will be sent to users who did not respond. In the questionnaire IBM, UTAUT2, Desirability, Self-Efficacy and Social Connectedness are used (appendix D). Collect the data and add the results in the format of results (appendix F). Remind the users of the user tasks of that week.

7 | T=2 Online questionnaire

Six weeks after the start of the testing, an online questionnaire about user experiences will be sent to all participants (appendix D). After 4 days a reminder will be sent to users who did not respond. In the questionnaire IBM, UTAUT2, Desirability, Self-Efficacy and Social Connectedness are used. Collect the data and add the results in the format of results (appendix F). Remind the users of the user tasks of that week.

8 | T=3 Online questionnaire

Approximately 2,5 months after the start the final online questionnaire about user experiences will be sent to all participants. After 4 days a reminder will be sent to users who did not respond. In the questionnaire IBM, UTAUT2, Desirability, Self-Efficacy and Social Connectedness are used (appendix D). Also the Willingness to pay questionnaire is added (appendix E). Collect the data and add the results in the format of results (appendix F).

When the testing period is shortened, these questionnaires are sent to the users when the testing ends.

9 | Dropouts

When users deliberately quit with testing the platform, they are considered dropouts. If possible, contact them to ask for the reason why they quit the study.

Appendices¹⁸

A	Information e-mail
B	User tasks
C	General questionnaire (T=0)
D	Questionnaire user experiences (T=1; T=2; T=3)
E	Willingness to pay questionnaire (T=0; T=3)
F	Format for results

¹⁸ For all appendices belonging to the Beta guideline, see Deliverable 5.2.



Appendix D: Questionnaires Beta

General questionnaire

1 GENERAL

1.1 Date of birth: _____

1.2 Place of residence: _____

1.3 Gender

- Male
- Female

1.4 What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

- ...
- ...

2 WORK

2.1 Are you already retired?

- Yes
- No

2.2 Which of the following work situations applies to you? (Multiple answers possible)

- Working (payed job)
- working (voluntary work)
- looking for a job
- none of the above situations

3 COMPUTER USE

3.1 Frequency of use

- Every day
- Once in a week
- Once a month
- I have tried a Computer one or two times, don't regularly use it
- No experience (skip 3.2 and 3.3)

3.2 Perceived skill level

- Not very skilled
- Not skilled
- Neutral
- Skilled
- Very skilled

2.9 Which PC programs do you use?



3.4 Experiences with other technology

- I do have a cell phone/ smartphone and use it never/sometimes/ regularly/ often
- I do have a cell tablet/ipad and use it never/sometimes/ regularly/ often

3. EXPECTATIONS

3.1 What do you expect from Palette?

3.2 What are your expectations for the usability of the platform?

Mark one option.

- I expect that I find it easy to use the platform.
- I expect that I experience minor difficulties using the platform.
- I expect that I find it difficult to use the platform.

3.3 Do you expect that you will succeed in creating new items on the platform?

Mark one option.

- Definitely
- Probably
- Neutral
- Probably not
- Definitely not

3.4 Do you expect to attend activities?

Mark one option.

- Definitely
- Probably
- Neutral
- Probably not
- Definitely not

3.5 Do you expect to make new contacts by using the platform?

Mark one option.

- Definitely
- Probably
- Neutral
- Probably not
- Definitely not



Questionnaire user experience

Welcome

You performed a number of tasks with the palette platform. This questionnaire gives you an opportunity to tell us your reactions to the Palette platform you used. Your responses will help us understand what aspects of the Palette platform you are particularly concerned about and the aspects that satisfy you.

Your answers will be used anonymously for the Palette project. If there is a question feel free to contact one of the researchers

Question 1 | Choose three words that fit your experience with palette

Accessible	Desirable	Gets in the way	Patronizing	Stressful
Appealing	Easy to use	Hard to use	Personal	Time-consuming
Attractive	Efficient	High quality	Predictable	Time-saving
Busy	Empowering	Inconsistent	Relevant	Too technical
Collaborative	Exciting	Intimidating	Reliable	Trustworthy
Complex	Familiar	Inviting	Rigid	Uncontrollable
Comprehensive	Fast	Motivating	Simplistic	Unconventional
Confusing	Flexible	Not valuable	Slow	Unpredictable
Connected	Fresh	Organized	Sophisticated	Usable
Consistent	Frustrating	Overbearing	Stimulating	Useful
Customizable	Fun	Overwhelming	Straight Forward	Valuable

Question 2 | Explain why you choose these words.

Question 3 | To as great a degree as possible, think about all the tasks that you have done with the Palette platform while you answer the following questions. Please read each statement and indicate how strongly you agree or disagree with the statement by circling a number on the scale. If a statement does not apply to you, circle N/A.

20. Overall, I am satisfied with how easy it is to use the Palette platform.

strongly
agree

1

2

3

4

5

6

7

strongly disagree

N/A



21. It was simple to use the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

22. I could (effectively) successfully complete the tasks and scenarios using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

23. I was able to complete the tasks and scenarios quickly using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

24. I was able to efficiently (quickly) complete the tasks and scenarios using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

25. I feel comfortable using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

26. It was easy to learn to use the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

27. I believe I could become productive quickly using the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

28. The Palette platform gave error messages that clearly told me how to fix problems.



strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

29. Whenever I made a mistake using the Palette platform, I could recover easily and quickly.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

30. The information (such as online help, on-screen messages, and other documentation) provided with the Palette platform was clear.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

31. It was easy to find the information I needed.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

32. The information provided for the Palette platform was easy to understand.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

33. The information was effective in helping me complete the tasks and scenarios.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----

34. The organization of information on the Palette platform screens was clear.

strongly agree	1	2	3	4	5	6	7	strongly disagree	N/A
----------------	---	---	---	---	---	---	---	-------------------	-----



Note: *The interface includes those items that you use to interact with the Palette platform. For example, the language, buttons, text-boxes, etc.*

35. The interface of the Palette platform was pleasant.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

36. I liked using the interface of the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

37. This Palette platform has all the functions and capabilities I expect it to have.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

38. Overall, I am satisfied with the Palette platform.

strongly agree 1 2 3 4 5 6 7 strongly disagree N/A

20. List the most negative aspect(s) of the Palette platform and/or interface:

1.
2.



3.

22. List the most positive aspect(s) of the Palette platform and/or interface:

1.

2.

3.

Question 4 | Please read each statement and indicate how strongly you agree or disagree with the statement.

	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
Performance Expectancy							
PE1. I find palette useful in my daily life.							
PE2. Using palette increases my chances of achieving things that are important to me.							
PE3. Using palette helps me accomplish things more quickly.							



PE4. Using palette increases my productivity.							
Effort Expectancy							
EE1. Learning how to use palette is easy for me.							
EE2. My interaction with palette is clear and understandable.							
EE3. I find palette easy to use.							
EE4. It is easy for me to become skillful at using palette.							
Social Influence							
SI1. People who are important to me think that I should use palette.							
SI2. People who influence my behavior think that I should use palette.							
SI3. People whose opinions that I value prefer that I use palette.							
Facilitating Conditions							
FC1. I have the resources necessary to use palette.							
FC2. I have the knowledge necessary to use palette.							
FC3. palette is compatible with other technologies I use.							
FC4. I can get help from others when I have difficulties using palette.							
Hedonic Motivation							
HM1. Using palette is fun.							
HM2. Using palette is enjoyable.							



HM3. Using palette is very entertaining.							
Habit							
HT1. The use of palette has become a habit for me.							
HT2. I am addicted to using palette.							
HT3. I must use palette.							
HT4. Using palette has become natural to me.							
Behavioral Intention							
BI1. I intend to continue using palette in the future.							
BI2. I will always try to use palette in my daily life.							
BI3. I plan to continue to use palette frequently.							

Question 5 | The following ten statements are about how you generally think and act. Please read each statement and indicate to what extent you agree or disagree. Answer what applies most to you *at this moment*.

		Not at all true	Hardly true	Moderately true	Exactly true
1.	I can always manage to solve difficult problems if I try hard enough				
2.	If someone opposes me, I can find the means and ways to get what I want.				
3.	It is easy for me to stick to my aims and accomplish my goals.				
4.	I am confident that I could deal efficiently with unexpected events.				
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.				
6.	I can solve most problems if I invest the necessary effort.				



7.	I can remain calm when facing difficulties because I can rely on my coping abilities.				
8.	When I am confronted with a problem, I can usually find several solutions.				
9.	If I am in trouble, I can usually think of a solution				
10.	I can usually handle whatever comes my way.				

Question 6 | Please answer what shows how much you agree or disagree with each of the following statements.

		Strongly agree 1	2	3	4	5	Strongly disagree 6
1.	I feel disconnected from the world around me.						
2.	Even around people I know, I don't feel that I really belong.						
3.	I feel so distant from people.						
4.	I have no sense of togetherness with my peers.						
5.	I don't feel related to anyone.						
6.	I catch myself losing all sense of connectedness with society.						
7.	Even among my friends, there is no sense of brother/ sisterhood.						
8.	I don't feel that I participate with anyone or any group.						



Questionnaire Willingness to pay

Below are three options for the way the Palette platform and membership can be organized.

Option 1 – Standard membership:

Items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items.

Option 2 – Premium membership:

The standard membership, but with the additional option to highlight your items so they are brought to the attention.

Option 3 – Moderator for supervision:

Items on the platform are visible for everyone, but only if you are a member you can actively participate on the platform and create items. There is a moderator actively involved in the platform.

Question 1 | Place the three options in the order of your preference.

1 st place (most preferred)	
2 nd place	
3 rd place (least preferred)	

Question 2 | What are you prepared to pay (one single time) for using the platform? Pick an amount between €0,- en €100,-

Option 1 – Standard membership	€
Option 2 – Premium membership	€
Option 3 – Moderator for supervision	€

Question 3 | What are you prepared to pay monthly for using the platform? Pick an amount between €0,- en €100,-

Option 1 – Standard membership	€
Option 2 – Premium membership	€
Option 3 – Moderator for supervision	€

Question 4 | Several situations that can influence your willingness to pay for the Palette platform are described below.

4.1 What would you be willing to pay if advertisement appears on the platform?



Mark one option.

- I would want to pay less
- I would want to pay the same
- I would want to pay more
- I don't know

4.2 What would you be willing to pay if a part of the platform is accessible for premium members only?

Mark one option.

- I would want to pay less
- I would want to pay the same
- I would want to pay more
- I don't know

4.3 What would you be willing to pay if everyone can access the platform and can create items, also people who aren't member.

Mark one option.

- I would want to pay less
- I would want to pay the same
- I would want to pay more
- I don't know

4.4 What would you be willing to pay if the local news of your municipality is placed on the platform?

Mark one option.

- I would want to pay less
- I would want to pay the same
- I would want to pay more
- I don't know

4.5 What would you be willing to pay if meetings for members of the platform are organized in the municipality?

Mark one option.

- I would want to pay less
- I would want to pay the same
- I would want to pay more
- I don't know

Room for comments:



