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Evaluation report

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Abstract

This deliverable reports from the second main evaluation of the Help-on-Demand prototype. Evaluations were carried out in Spain, Norway and Romania in the summer of 2013. A main finding from this second evaluation report of the MobileSage prototype is that usability and accessibility have been clearly improved since the first evaluation. In the first evaluation a number of accessibility and usability problems were reported. The substantial improvements concerning accessibility and usability are reported in the interviews with participants, but is also shown from comparing the results on the System Usability Scale Survey of 2012 and 2103. The participants clearly state that they find the basic functionality useful, in particular the way the MobileSage system can provide help-on-demand by exploiting the affordances of NFC and QR codes. Users find the concept Help-on-demand attractive and useful in the ways this is demonstrated in the trials. The scenarios in the three countries are different, but the users feedback is quite similar. Due to lack of usage data, it was not feasible to test out adaptivity affordances in this evaluation round.

1 Introduction

1.1 Scope of the deliverable

The intention of this deliverable is to create an overview of how the evaluation took place, the main findings, and what should be the next steps in the project. The structure of the deliverable is as follows. We will discuss the participants that were involved in the test in Section 2.2. The setting for the test study and how we conducted the test is described in Section **Error! Reference source not found.**. In Section **Error! Reference source not found.**, we present the results from the test. Finally, we make some concluding remarks in Section **Error! Reference source not found.**, and set some requirements for what needs to be done further in the project.

1.2 Summary from the field trials in Norway, Romania and Spain summer 2013.

Overall conclusions:

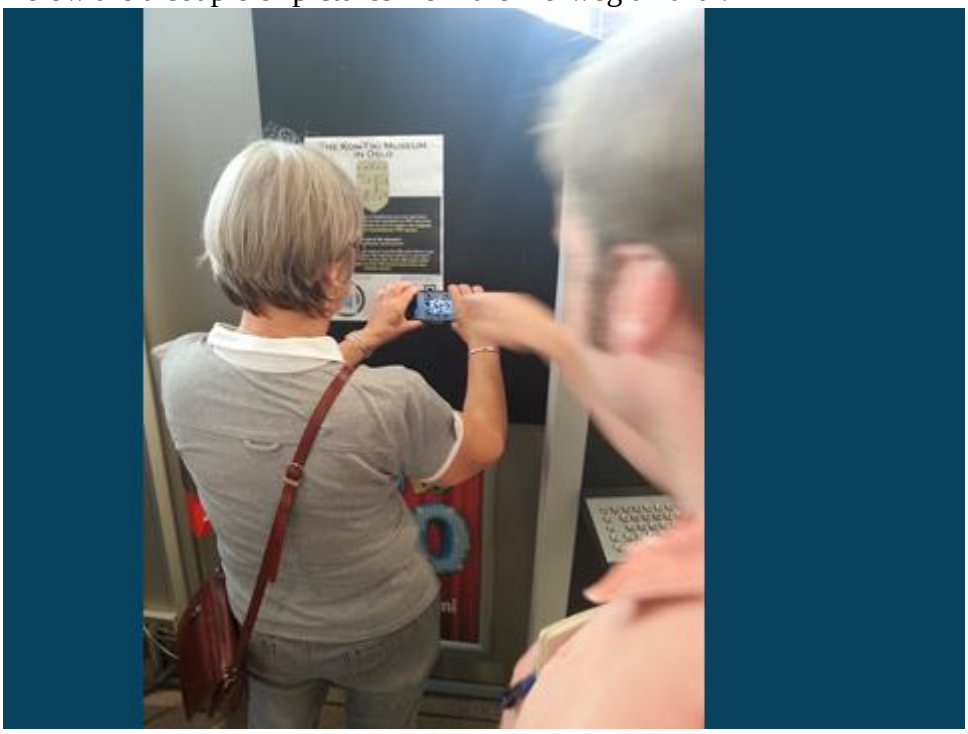
- The usability and accessibility of the HOD prototype have been significantly improved from the previous trial
- The usability and accessibility problems from the first trial were now corrected
- User acceptance level has increased significantly in all three countries since the first trial
- Users found basic functionality found useful and relevant
- QR and NFC: found very useful as means of communication. Help to get quick access to relevant information. Various preferences NFC vs QR, useful that both are available.
- Experience with Smartphone is a clear advantage in order to make full use of the MobileSage system, and also to feel comfortable using it
- The personalization and adaptation features were only superficially tested due to lack of data from relevant number of users

1.2.1 Summary –main findings Norwegian trial

- User acceptance level clearly increased since first trial
- None uses used the settings/no change under way
- Very few had heard about NFC, many knew what QR is
- Almost all found NFC/QR very useful and easy to use, but some found QR more cumbersome
- NFC/QR response time was very good
- Video and audio was accessible and understandable
- VideoCC is viewed as the most appropriate media type as it combines visual with audio and text.
- Preferred mode of presentation (step-by-step) or directly is dependent on the situation
- Different language options is useful
- Users did not notice the adaptivity changes (UI changes)

- Some remarked that the text/fonts were too small
- Some found that using the MS app in public (e.g close to a ticket machine together with many people) made them feel a bit unsafe and unprotected
- Search function was intuitive and useful
- Outdoor: traffic noise was a problem (problem hearing the sound on the videos) "elderly never use head phones, you know")
- Noise also a problem for some indoor in the traffic office where the ticket machines are situated. Problem hearing the video sound because of the noise from other people.
- Outdoor: bright sunlight was a problem, difficult to see what was on the mobile screen

Below are a couple of pictures from the Norwegian trial.



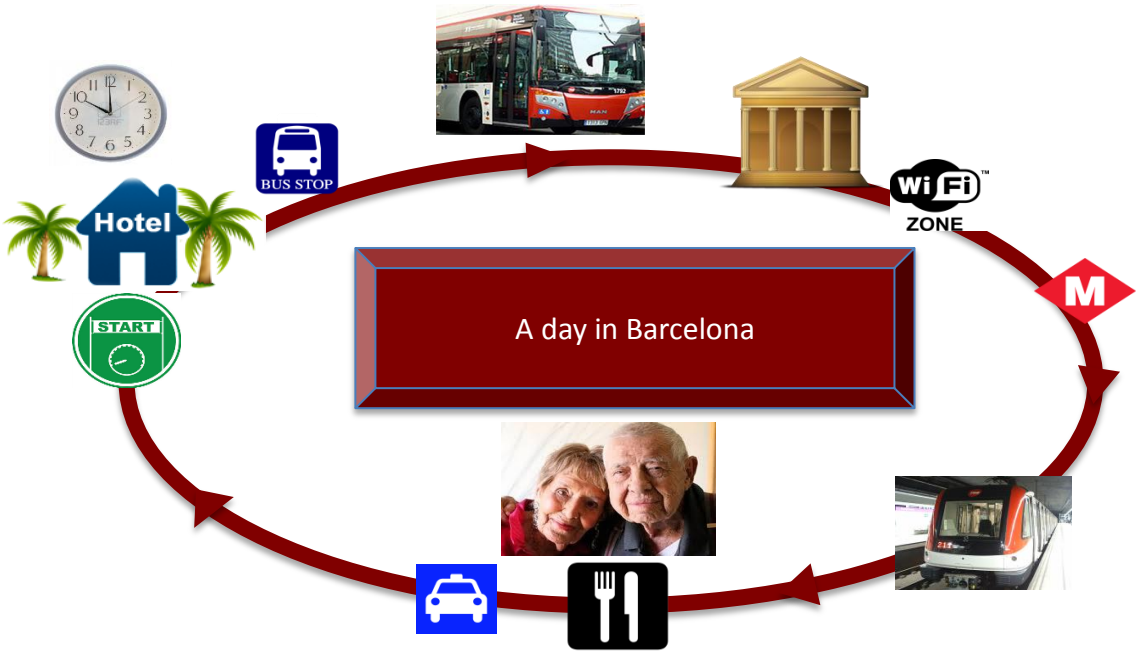
1.2.2 Conclusions SPAIN

It is clear that in this iteration usability issues have improved remarkably as the scores of the questionnaires indicate. The observed level of satisfaction with the app is very high but also the perceived value for a Help on Demand service such as Mobilesage. The scan function was seen as the most valuable and it was a little cumbersome for some of the users. Perhaps, some work is needed to improve it a little bit.

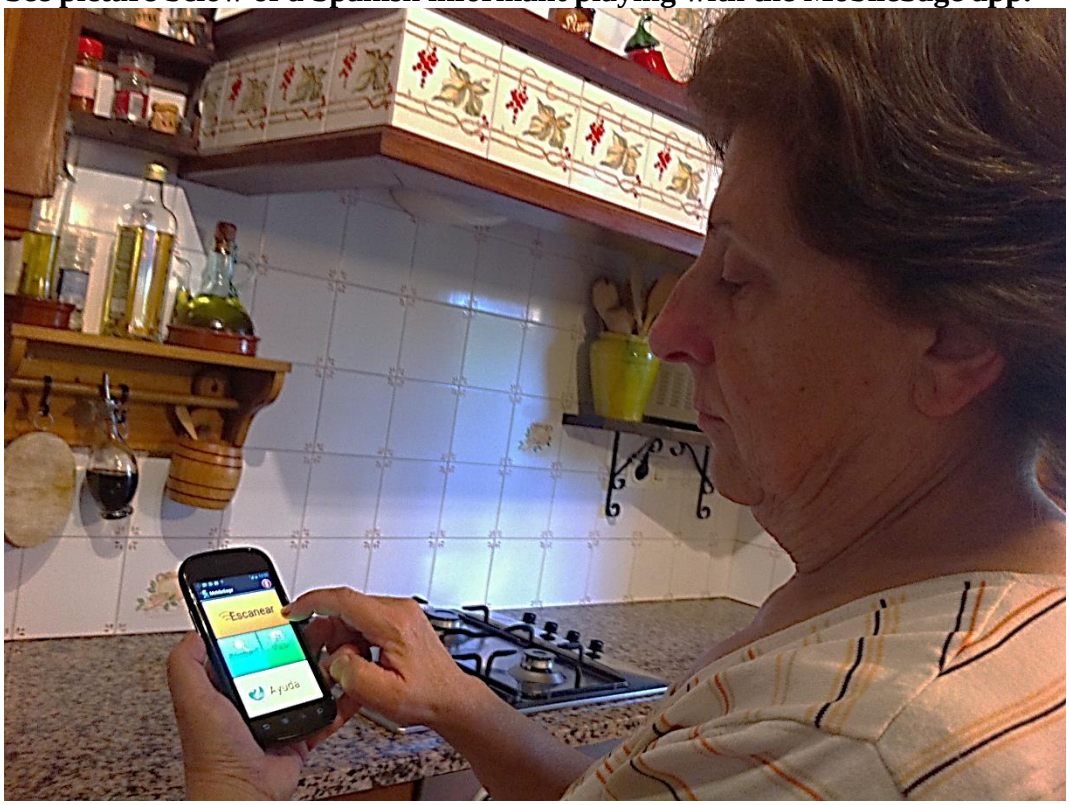
We have observed a big difference between users that are acquainted with SmartPhones and the ones who are not. Mainly, the ones that don't have a SmartPhone would need some help to start. It would be convenient to explore some commercial scenarios where prescribers could take the role of "technical enablers". For instance, in a tourism scenario, Hotel's receptionists could be the people to introduce the HELP on Demand service of the city and show how to install it. Also lending/renting a Hotel's Mobilesage SmartPhone with the app already installed should be explored.

Last but not least, in this last iteration most of the efforts must be put in consolidating the app making it quick and robust.

The figure below illustrates the Spanish trial scenario



See picture below of a Spanish informant playing with the MobileSage app.



Conclusions ROMANIA

There was a general agreement on the high utility of the MobileSage application.

- QR code scanning was highly appreciated as very useful and easy to use (with the precondition of becoming more familiar with the smart phone and MobileSage app through sustained previous training).
- NFC code scanning required the user to find the proper position for accomplish the scanning. For this reason, half of them are lesser prone to use this function.
- There was a general agreement that Help function and Phone settings (Font size and Language selection, Information type selection and Screen brightness setting up functions) are very useful, but especially the old end-user needs previous training and personal exercise to easily and successfully use them.
- The MobileSage app icon on the start page of the phone must be made more distinct among the other phone icons: either bigger or brighter, for example.
- The appearance of the most frequently used function (Scan. Search, Travel) in the upper part of phone screen was unanimously agreed as very useful.
- Video-audio and text provided information were the most preferred.
- The participants express the need of getting used to the smart phone as a precondition. This correlates with their opinions related to the questions about phone settings (font size and screen brightness setting up etc.), language selection etc.
- Phone settings/personalization in terms of disabling those functions/icons not needed by a given user was also suggested.
- Especially the participants with mild cognitive impairments underlined that the app and services it provides are very interesting, highly useful indoor and outdoor and not only for old people, but the reluctance of old people to advanced technologies resides in their fear of not being able to learn how to use them on their own. For this reason, the previous training of the old end-user, better with a human assistant, will be the key to be thoroughly considered by the consortium team (a training protocol or something like this).

Pictures from the Romanian trial


Mobile Sage

2 Norwegian Report

This report from the Norwegian MobileSage trial summarizes the results from the evaluations of the MobileSage application that was performed 13 and 14 June 2013 with participants from Seniornett. The report includes the setting of the evaluation, the main findings and the questions used in interviews.

2.1 Background

The purpose of the MobileSage application is to enhance the inclusion of the elderly in the self-serve information society. The application provides a help-on-demand service that offers relevant, accessible, and usable content upon request, in the form of multimodal and personalized instruction and guidance. With this, we aim to enable people to help themselves. .

2.2 Participants

Seniornett was in charge of the recruitment of participants. In line with the previous trial, users with varied ICT and mobile phone experience were recruited, especially important with users who had limited experience with smart phones. We also tried to recruit users with non-native Norwegian language background and were successful since two participants had English as their native language (1 participant) or had lived in US most of her adult life (1 participant). Users came mostly from the Oslo area. Ten participants were recruited.

Error! Reference source not found. presents the users, educational level, and how they classified their level of ICT and in particular smartphone experience.

Table 1. The participants.

Nr	Age	Gender	Educational level	Experience PC	Experience smart phone
1	70	M	Tertiary level , first stage (University)	Experienced	No experience, uses ordinary mobile phone
2	77	M	Post-secondary non-tertiary education	Experienced	Some experience smart telefon
3	71	F	Tertiary level , first stage (University)	Experienced	Has a smart telephone, but limited usage (No apps, internet etc)
4	70	F	Tertiary level , first stage	Experienced	Uses smartphone, has experience
5	67	F	Post-secondary non-tertiary	Some experience	No smart phone experience

			education		
6	83	F	Tertiary level , first stage	Experienced	No smart phone
7	77	F	Tertiary level , first stage	Some experience	No smartphone experience, uses a Doro now
8	82	F	Post-secondary non-tertiary education	Some experience	No smartphone experience
9	82	M	Tertiary level , first stage	Experienced	Experienced
10	75	F	Tertiary level , first stage	Experienced	Experienced

The participants are well educated, but with various experience with ICT. Half of the participants are users of smartphones, but it is interesting that few have actually exploited the full potentials of the smartphone. The average age is 75.4 years. Mostly women (7/3), which may be a coincidence, but we believe it reflects that the majority of elderly that are participating in the ordinary Seniornett courses are women.

2.3 NORWEGIAN SCENARIO and the settings for the trial

2.3.1 Scenario: Foreign tourist visiting Oslo.

The basic idea is that we want to provide MobileSage supported assistance to a tourist coming to Oslo and who is interested to visit the Kontiki Museum. (see http://www.kon-tiki.no/e_aapning.php). This museum is located approximately 7 kilometers from the tourist's starting point, the central railway station in Oslo. After the tourist has arrived. We call her Shirley and she comes from Sheffield in England.

Here are the basic steps in the scenario:

- Shirley wants to go to the Kontiki museum by means of public transport.
- She knows that the MobileSage app can help to find out about the museum and how to get there.
- She goes to the tourist information office near by the station.
- In the tourist office she can find a museum poster on which she can scan a QR or a NFC tag to find out about the museum. Or she can use the Search function, write "Kontiki" and information will be provided.
- She wants to buy a bus ticket and MobileSage can show her how to use the ticket machine by first scanning a QR code or NFC tag on the ticket machine. The information provided shows a short "how to" video which she may look at if she thinks she needs it.

- She can find out where the nearest bus stop is by using the Travel function in the MobileSage application. She is shown visually on the map where to go to the bus stop, just down the street.
- She can use the MobileSage app on the phone to find the arrival time for the next bus, and she is also informed about delays.
- She will also use the MobileSage to find out where she must get off the bus close to the Kontiki museum.

2.3.2 About the settings and the contents

The trial made use of contents that also was used last year, for example the instructions about how to use the Ruter ticket machines. There were three phases of the trial:

1. Introduction, information about the user's experience with smartphones etc, also instruction about how to use the smartphone and how to use the MS app. This was done indoor, in an office in the Oslo central station especially rented for this occasion
2. The actual trial. The participants must walk approx. 200 meters, to the Ruter ticket office where some tasks are carried out. After that they are asked to go to the nearest bus stop to the bus that goes to the Kon-Tiki Museum; it is about 100 m, but just across the street.
3. Wrap up and final interviews. After the trial, the participants go back to the office where they started where they are interviewed about what happened in the field trial.

In the trial the participants also made use of the instruction contents related to how to use the Ruter ticket machine, this contents was used also in 2012, In addition to the ticket machine assistance contents, there were also contents about the Kon-Tiki Museum. Also, in the 2013 trial we integrated use of Ruter´s own traffic planner in our trial, as described in the scenario above.

Forsøksoppsett

- Har delvis laget noe nytt innhold for Kontiki, delvis brukt noe fra forrige evaluering
- I samarbeid med Seniornett
- 10 Seniorer, alder 65+??, 1 engelskman, 3 menn, 7 kvinner, de fleste har brukt smartphone før
- 2 smartphones med MobileSage og Mobildata slått på

Forsøksoppsett, fort.

1. Prøve ut appen/scanning på Ruters lokaler i Østbanehallen (om Kontiki, statisk innhold)
2. Gå til Trafikanten, kjøpe billett (VideoCC, Audio, FText, statisk innhold)
3. Finne busstoppen (dynamisk innhold fra Ruter)
4. Se på sanntidsinfo for når neste buss kommer (dynamisk innhold fra Ruter)
5. Gå av bussen ved rett stopp (dynamisk innhold fra Ruter)

Mulige forbedringer

- delvis kronglete å integrere Ruters reiseplanlegger.ruter.no i MobileSage med redirect
- for liten skrift og for små knapper i nettleseren på mobil
- ikke engelsk overalt på Ruters engelske sider (veibeskrivelse er på norsk)
- bruk av øst/vest i veibeskrivelsene er problematisk

Mulige forbedringer, forts.

- rutelinje i kart delvis unøyaktig
- vanskelig å skille mellom tid for neste buss og enda senere busser
- vise trasé direkte på en separat side, og bruke andre fargekoder
- nevne at kartbilde ikke kan zoomes
- flere sideelementer med ID som det kan hoppes til rett etter nedlasting

Mulige forbedringer, forts.

- delvis dårlige kontraster

2.4 Main findings

Below is a summary of the main findings in the trial.

2.4.1 Technical issues

The 2012 trial in Oslo had some serious technical difficulties which affected the trial and its outcome. As opposed to this, the 2013 went well without any major technical hindrance or complication. This meant that we could concentrate on testing out the prototype as such, focusing on testing the prototype related to the concept and goals, functions, usability and accessibility aspects.

In the 2012 trial there were problems with bandwith, especially in the subway station which made it difficult to download videos. There were no such problems in the 2013 trial. The participants had quick access to the contents and when asked after the trial, they said the response time was OK.

In the 2012 trial it was also reported problems with the use of the NFC tags, in particular when they were placed on a metal surface. This was not a problem in the 2013 trial. See more about use of NFC and QR codes below.

2.4.2 Mobile phones

Two Android phones (Samsung Galaxy) were used in the tests. As in the 2012 trial, the users had varied experience with smartphones. As part of the preparation before the 2013 trial, all participants were given instruction about how to use the smartphones. Several of them said they found it difficult to see and write on the keyboard because the letters were to small, making writing and reading cumbersome. This may be a reason why the users found NFC and QR code so attractive when searching for information. In stead of having to type a word in the Search field, they can just place the smartphone close to the NFC tag or the QR code and the preferred information, e. g. a video appears quite immediately.

2.4.3 Travel

Due to priority reasons and need to focus, the travel function of the MS app was not explored in the Oslo trial, but information with use of map was part of the scenario and the content material. Information about how to go from the ticket office to the bus stop was included in the application. The user was shown a map with a thick direction line indicating how to walk from ticket office to the bus stop.

2.4.4 Search

In the introduction session, all participants were informed about the search function and relate this to the scan function. The informants were informed that they may access the same contents by using Search respective Scan. This meant that they were able to carry out informed choices between the alternatives. All found Search function easy to understand easy to use. This was not surprising taking into consideration that although they had varied experience with smartphones, none were novice ICT users.

2.4.5 Language

Two participants preferred English as main language, the rest used Norwegian. Overall, the English MobileSage version was acceptable for the English-speaking testers. The language issues or problems were related to Ruter's travel planner which had an English version but this was not complete but also had several Norwegian elements. For example, the specific detailed direction descriptions are not fully translated.

2.4.6 NFC and QR code

All participants were introduced to the NFC and QR concepts in the introduction. Most had heard about QR codes or at least said they had noticed it, but very few knew about NFC. None had noticed the NFC logo before or identified the logo as a NFC logo.

All participants used NFC or QR code during the trial. Almost all, with one exception, found that NFC was more easy to use because they experienced that when placing the smartphone to the NFC tag, the information appeared quite instantly on the phone.

When using the QR option, many found this more cumbersome because they had to be meticulous and careful to be able to find the correct distance and angle from the smartphone to the QR code on the wall/poster.

As opposed to the 2012 Oslo trial, the design of the application now made it easier to come directly to the relevant information. Most participants preferred clearly to come directly to the information, but the stepwise access option that was applied in the prototype was also shown to be relevant in case there are much content about similar issues.

In general, the participants found NFC and QR modes of information handling attractive and that they would prefer NFC/QR rather than Search (where typing is required). An important reason for this is (as mentioned also above) is that typing and writing is not needed, you can just place the smartphone to the NFC tag.

2.4.7 Accessibility issues

In general, the participants found the prototype accessible, but there were several issues that we had not thought of in advance, especially related to the "real life", outdoor and crowded traffic scenario of the trial.

In general, several participants found the text/font size and also the letters in the keyboard, too small. This problem became even more pertinent due to the outdoor test environment with heavy traffic and noise:

- Outdoor: traffic noise was a problem (problem hearing the sound on the videos). As one of the participant remarked *"elderly never use head phones, you know")* and therefore must listen to the sound from the relatively weak speakers in the smartphones.
- Noise was also a problem for some indoor in the traffic office where the ticket machines are situated. Problem hearing the video sound because of the noise from other people.
- Outdoor: bright sunlight was a problem, making it difficult to see what was on the mobile screen
- Contrast were sometimes not satisfactory for testers, especially outdoor.

2.4.8 Personalization and adaptivity

The participants all agreed that it was valuable for them and other elderly as well, that it was possible to customize and personalize when it comes to media modalities and output. Due to time constraints, the issue was not prioritized to be tested systematically, but it was made clear for the participants that they may adjust the settings according to their own preferences. However, none actually changed the default settings. This also indicates that user's preferred modality was Video CC as it combines visual with audio and text.

Regarding adaptivity, we could, as evaluators, see that this worked when the most used main function was placed on top. However, the participants did not seem to notice this. Due to lack of usage data, it was not feasible to actually test out this in a realistic manner in this evaluation round. This should be addressed in further work.

2.4.9 User acceptance

The table below shows the result from the System Usability Scale (SUS) survey. The SUS was also used in the 2012 trial in Norway. A comparison of the results from 2013 and 2012 is informative. The main finding from the questionnaire survey from the 2012 survey was that although the users found the MobileSage useful and relevant, they also raised questions about the usability of the application. Although users said that they don't need technical support to be able to use the application, they are not ready to say that they find the application easy to use.

2.4.9.1 Table 2: System Usability Scale Survey

	1: Strongly disagree (2, 3 and 4) 5: Strongly agree	
	Results from 2013	Results from 2012 trial
1 I think that I would like to use this system frequently.	4.0	3.5
2 I found the system unnecessarily complex.	1.7	1.6
3 I thought the system was easy to use	4.4	3.1
4 I think that I would need the support of a technical person to be able to use this system	1.9	1.7
5 found the various functions in this system were well integrated	3.8	3
6 I thought there was too much inconsistency in this system	1.4	2.5
7 would imagine that most people would learn to use this system very quickly	4.3	3.8
8 I found the system very cumbersome to use	1.3	1.3
9 I felt very confident using the system	3.2	2.6
10 I needed to learn a lot of things before I could get going with this system	2.3	3.5

When compairing the results from 2012, the user experience improvements as evaluated by users, are clearly documented. Overall, our participants have a positive view on the MobileSage system. There are improvements on almost all issues, but the largest positive change and difference is question number 3: "I thought the system was easy to use" with an increase from 3.1 (uncertain) to 4.4 (clear agreee) average score

2.4.9.2 Detailed results from the SUS 2013 survey

Partci-pant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Averag e score
1	3	3	4	5	4	4	4	5	4	4	4.0
2	1	1	1	1	4	2	4	1	1	1	1.7
3	5	4	5	5	4	4	4	4	4	5	4.4
4	1	1	1	4	2	2	2	1	4	1	1.9

5	3	3	5	4	4	4	2	4	5	4	3.8
6	1	1	1	1	1	1	1	1	1	5	1.4
7	5	4	5	4	4	4	4	4	5	5	4.3
8	1	1	1	1	1	2	3	1	1	1	1.3
9	3	2	5	4	2	4	3	4	2	3	3.2
10	1	1	2	4	5	3	4	1	1	1	2.3

3 APPENDIXES

3.1 Description of the field trial procedure, interaction, content and modalities.

Task/action	Location	MobileSage interaction	Content	Modality (text, audio, video)	Duration
Preparations/instructions					30 min
Welcome and information to participants. - **Check that the participant is informed about the project and the purpose of the test** - **If the participant has not read the information sheet, read this aloud.** - **Participant signs a consent form.**	Sjøsiden kurssenter		Info sheet Consent form		
Instruction about how to use MobileSage (MS) and its functions: - **"Hands on" instruction about how to use the MobileSage application.** - **Show basic functions: scan, travel, search.** - **Show results, explain icons** - **Show how NFC and QR works.** - **Show how to edit and change profile settings** **- Present the Kontiki scenario. (TL =test leader reads aloud)**	Sjøsiden kurssenter	Instruction, walk through with MS instructor	MS app (all functions) Scenario description	all	
Test tasks					
Task 1: Information about the Kontiki museum and how to get there **Kontiki video** **Bus trip information, using Ruter's data ,bus no 230** **Go to Ruter kundesenter (ca 200 m), out of the building, TL shows the way**	Sjøsiden kurssenter	Use NFC tag. (Hold phone close to the tag Scan-function	MS app Scan	Video CC, Audio, text	6 min
Task 2: How to buy a ticket? Read and	Ruter kurssenter	Use MobileSage NFC tag on the TVM in in	Ms App Scan or	Video CC	5 min

hear information about how to use ticket machine.		the "Ruter Kundesenter" Hold phone close to the tag.	Search	Audio Text	
Task 3: How do I get to the nearest bus stop for the 230 bus til Kontiki Museum.	Ruter kurssenter	Use video info, step by step	Static map, the route from Ruter kundesenter to the bus stop; 150 meters	text	5 min
Task 4: Real time information about when the next bus is expected to arrive at the bus stop	Bus stop Jernbanetorget	Hold phone close to other NFC tag, placed on the inside of the gates	Dymamic content, from Ruter	Text,. audio	4
Task 5 Where do I get off the bus? (headed for Kon-Tiki museum?	Bus stop	Search	Dymamic content, from Ruter		4
Return to Sjøsiden kurssenter					4
AFTER TRIAL- - **Interview** - **Usability form filled in** - **Present card**	Sjøsiden kurssenter				20
TOTAL:					**1 t 18 m**

3.2 Questions before and after trial

disagree agree

Spørsmål/Questions	**Svar/Answers**
Deltakernr/Particip.nr___ Kjønn (M/F):	
SPØRSMÅL FØR UTPRØVING/Questions before trial	
1. Hva er din alder? *(Your age.)*	
2. Hva er din høyeste utdanning 1:Grunnskole, 2: Videregående/Gymnas , 3. Høyskole/universitet. *Highest level of education (use user's own term/classification in English*)	
3. Hva slags mobiltelefon bruker du? *What kind of cell phone do you use?*	
4. Har du erfaring med smarttelefon? Evt hvor lenge? *Do you have experience with smartphones?*	

How long?	
5. Hvordan vil du karakterisere seg selv som IKT-bruker: A: nybegynner, B: noe erfaring, C: god erfaring. *How will you characterize yourself as an ICT user? : A: Novice, B: some experience. C: good experience*	
SPØRSMÅL ETTER UTPRØVING/Questions after trial	
Vi skal stille deg noen spørsmål om det har vært gjennom. Først skal vi spørre noen spørsmål som du skal svare muntlig på. Til slutt skal du fylle ut et lite spørreskjema	
1. Først noen spørsmål om NFC og QR-koder. Har du hørt om NFC og/eller QR før? Hvis ja, hvor/i hvilken sammenheng har du hørt om dette? *First, some questions about NFC and QR codes. Have you heard about these before? If yes, when/in which context have you learned about them.*	
2. Du brukte NFC/QR da du la mobilen til Kon-tiki-plakaten og fikk fram informasjon/ videoen. Hvordan syntes du det var å få fram informasjon på denne måten? Evt utdyp. *You used NFC/QR when you placed your mobile close to the Kon-Tike poster and then information/video appeared. What do you think about this way of getting information presented? Please explain.*	
3. Gikk det passe raskt å få fram informasjon ved bruk av NFC/QR? *Did you receive the information sufficiently quick when using NFC/QR?*	
4. Hvis video: Var bilde og lyd forståelig og tilgjengelig for deg? *If the video was used: Was the video and sound understandable and accessible to*	

you?	
5. Så et par spørsmål om det som skjedde i Ruters kundesenter: Hvordan fungerte det å få fram informasjon om billettautomaten ved å legge mobilen mot NFC tag på plakaten? *So a few questions about what happened in the Ruter customer centre: How did it work to elicit information about use of the ticket machine by placing the mobile on the NFC tag on the poster?*	
6. Var informasjonen du fikk om bruk av billettautomaten forståelig for deg? Utdyp gjerne. *Was the information you received about how to use the ticket machine understandable for you? Please explain*	
7. Syntes du informasjonen du fikk var utfyllende nok til at du lett kunne kjøpe billett? *Was the information you received detailed enough so that you could easily buy the ticket?*	
8. Hva syns du om å bruke NFC til å få fram ønsket informasjon slik du har gjort i forbindelse med informasjon om Kon-Tiki og å kjøpe billett? *What do you think of using NFC to display the desired information as you have done with Kon-Tiki and buying tickets?*	
9. Opplevde du at du måtte vente lenge før systemet ga deg respons? *Was the response time in the MobileSage system too long?*	
10. I MobileSage kan du velge å få samme informasjon presentert med ulike mediatyper (tekst, video, lyd, bilde). Hve mener du om nytten av dette? Hvordan mener du nytten kan være for funksjonshemmede, f eks blinde? *In Mobile Sage can choose to get the same information presented by different media types (text, video, audio, image). What do*	

think of the usefulness of this? What do you think about the benefits for disabled, e g a blind person?	
11. I MobileSage kan brukeren velge mellom ulike språk på innholdet. I hvilke sammenhenger kan dette eventuelt være nyttig? *In MobileSage the user can choose between different languages to present content. In which context can this be useful for you?*	
12. Var MobileSage-systemet som helhet forståelig og logisk lagt opp? Utdyp gjerne. *Was MobileSage system as a whole, understandable and logically organized? Please explain*	
13. Vi ønsker å høre hva du syns om ideen bak. MobileSage. Hva synes du om ideen om å bruke mobilen til å få hjelp «når som helst – hvor som helst» - dvs akkurat når du trenger det? Gi gjerne eksempler på hvordan MobileSage kan være til nytte for deg. *We want to hear what you think of the idea behind Mobile Sage. What do you think about the idea of using cell phones to get help "anytime - anywhere" - exactly when you need it? Please give examples of how MobileSage may be beneficial to you.*	
14. Har du noen forslag til hvordan MobileSage-systemet kan gjøres bedre? *Do you have any suggestions regarding how the MobileSage system can be improved*?	

4 Second MobileSage Prototype Evaluation with the Romanian End-users

Place: Ana aslant International Foundation, Bucharest, Romania
Date: 26.06.2013

Authors:

Ileana Turcu
Alexandru Sterea
Iulian Anghelache
Luiza Spiru

4.1 Introduction

This report refers to the evaluation of the second Mobilesage application prototype with the Romanian end-users, accomplished by us on June 26-27, 2013 within the AAIF's Clinic of Memory Diseases from Bucharest, based on two new indoor mobility scenarios. The goal was to test the improvements of the system based on the conclusions extracted from the evaluation of the first prototype variant, in terms of:

- Acceptance of the system and evaluation of its functionality for indoor mobility improvement in old people,
- Suggestions for further improvements.

1 Methodology

1.1 Scenarios

Two new scenarios envisaging the support of the indoor mobility by the MobileSage app were used by the Romanian pilot:

Persona

Marta lives alone. She is 70 years old and has minor, compensated visual and auditive impairments, and occasionally, mild memory impairments. However, she is still independent and able to accomplish her daily living tasks, but any help in this respect is welcome. She has a son which is frequently traveling abroad and she likes to keep in touch with him as much as possible.

Scenario 1 –MobileSage app helps Marta in the kitchen

In this scenario Marta uses the smart phone with the MobileSage application for cooking a new course based on a recipe from a cooking book that her son sent her when he traveled abroad. Because the book is in German language and Marta does not speak this language, Victor placed a QR code tag on the first page of each cooking recipe. By using the "Scan" function of MobileSage app, Marta can receive the recipes in Romanian thanks to her son who uploaded them on the CMS.

Scenario 2 – MobileSage app is a companion for Marta's loneliness

In this scenario, Marta uses the smart phone with the MobileSage app for listening her preferred music and browsing the last pictures that her son sent her from his recent travels in Norway and Spain.

MobileSage sm

By scanning “My
Marta can retriev
preferred music.
By scanning “My vid
can retrieve a pre

1.2 The participants

The voluntary end-user group included 10 old people, males and females, aged between 56-80 years, mean age 61 years, 5 of them with compensated audio-visual impairments and 5 with mild memory disturbances actually under specific treatment. All of them were conventional mobile phone with keyboard users, 4 of them using SMS receiving and 2 of them SMS sending functions of their phones.

Participant Nr.	Participant Name	Age	Gender	Health status	Phone user type
1	VC	70	Female (F)	Visual/ hearing mild impairment (compensated)	Conventional mobile phone
2	VJ	76	Male (M)		
3	ZI	80	M		
4	BN	74	F		
5	PM	73	F		
6	BM	59	F	Visual/ hearing mild impairment (compensated)	
7	BM	56	M		
8	DM	63	F		
9	SA	63	F		

10	SV	66	B	/Mild memory impairments (under treatment)	

1.3 Testing protocol

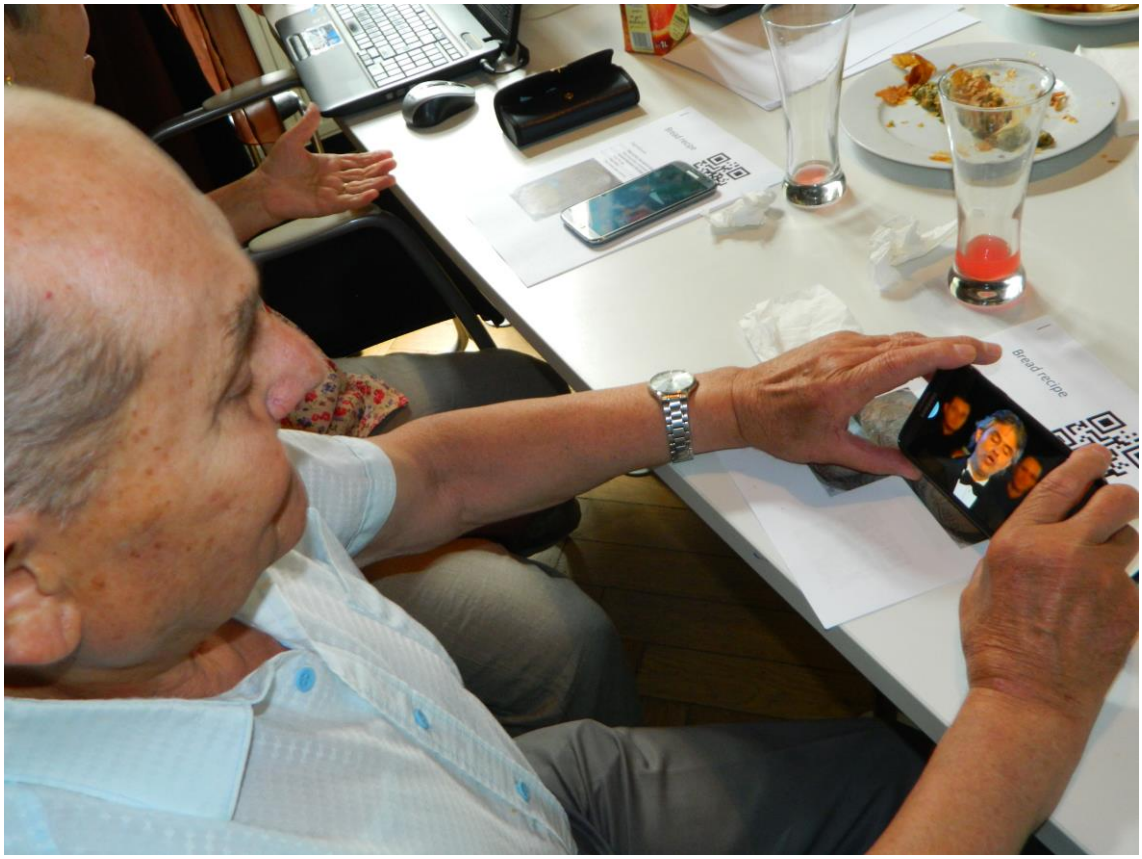
The testing session consisted of:

- A previous presentation of the project stage and of the second variant of MobileSage prototype, in which their actual role in the actual testing session was clearly specified. The presentation was frequently interrupted by discussions initiated by the presenter or by the participants, and the content of each discussion was noted and later analysed.
- A practice with the "Samsung Galaxy Note 2" Android phone having the MobileSage app installed on it (each participant had s/his device to work with):
    - To explore its general functions/interfaces, supported by one of the investigators (10-15 minutes)
    - To explore the MobileSage app content (the 4 main functions: Map, Help, Search, and especially Scan, in accordance with the tasks of the two new scenarios)
    - To scan the QR codes included in each of the two scenarios and get the information required, by each participant (10 minutes).
    - To scan NFC codes by each participant (10 minutes).
    - To individually fill in the Questionnaire-Interview (See Annex 1).

During the work with the smart pone and MobileSage app each participant was encouraged to think loudly and s/his comments were noted and later integrated in the analyses of the results.
The testing staff included 1 principal investigator, 1 scientific researcher, 1 specialty doctor (geriatrist), two medical assistants and one technical representative (Ing. Iulian Anghelache, from TeamNet – Bucharest).


Focus Group 2
Pilot Romania
09.04.2012
Evaluarea 2
Prototip aplicatie
MobileSage
26/06/2013
TEAMNet
Mobile Sage


Melodiile mele



4.2 2. Results and findings

The results of the testing session are summarized below.

Questionnaire-Interview/Discussions Analysis
The figures in the tables below reflect the number of paricipants responding in a given manner to each question.

Task	Degree of difficulty			
	No difficulty	More or less difficult	Difficult	Analysis of results/ comments of participants
Detection of MobileSage icon on the start page	6	3	1	Four participants need an icon of the application easily detectable among the other icons on the start page (bigger or brighter etc.)
Access to "Scan",	9	1		Only one person with mild

"Travel" and "Search" functions				cognitive impairment consider the task as being of average difficulty.
The scanning of the QR code tags	8	2		The two persons who express a medium degree of difficulty with this task say that this can be over passed by more exercise with the phone and app.
The scanning of NFC tags	8		2	The two persons who express difficulty with this task say that this can be over passed by more exercise with the phone and app.
Obtaining of video/graphic information related to system use	9		1	The person that considers difficult to obtain video/graphic information related to system use declare that she needs to become more familiar with the smart phone.
The clarity of video-content	Pore	Good 1	Very good 9	
The clarity of graphic content	Pore	Good	Very good 10	
Type of information preferred	Video-audio 7	Graphic 4	Text 6	Video-audio and text provided information are the most preferred
Phone start page use	1	5	4	The participants express the need of getting used to the smart phone as a precondition. This correlates with their opinions related to the questions about phone settings (font size and screen brightness setting up etc.), language selection etc.
The list of results is intuitive enough?	10	-	-	
"Help" function	8	2	-	Generally very well accepted.
"Travel" function	8	2	-	Generally very well accepted.
"Search" function	7	3	-	Generally very well accepted.
Phone setting functions	1	4	5	Nine of the participants are more or less reluctant about phone settings; all of them

				declare that a previous careful training with a human assistant on "deciphering" how to use the smart phone and his functions is "a "must". Four of them suggest disabling that functions they do not need to use.
"Emergency call" function	9	1	-	
Font size set up function	2	7	1	Eight of the participants are more or less reluctant about phone settings; all of them declare that a previous careful training with a human assistant on "deciphering" how to use the smart phone and his functions is "a "must". Five of them are mildly cognitively impaired.
Language selection function	5	5	-	Five of the participants are more or less reluctant about phone settings; all of them declare that a previous careful training with a human assistant on "deciphering" how to use the smart phone and his functions is "a "must". Four of them are mildly cognitively impaired.

How much do you think to use the MobileSage app and its services?

Question	Frequently	When needed	Not at all
This phone	**7**	**3**	
QR codes scanning	9	1	
NFC codes scanning	5	3	2
Travel	5	5	
Search	6	4	
Help	2	8	
Font size setting up		9	1
Application settings - Language selection		8	2

Application settings – selection of information type: video, audio, graphic	1	7	2
Application settings –screen brightness setting up		9	1

- The three participants declare to use the application when needed because they declare they need to previously learn how to use it. The same is specified by the participants expressing their option to use Travel, Search, Help, Font size and Language selection, Information type selection and Screen brightness setting up functions.
- NFC code scanning required the user to find the proper position for accomplish the scanning. For this reason, half of them are lesser prone to use this function.

The acceptance of MobileSage "Scan" function (nr. of participants) **:**

Question	Yes	Somewhat	No
Do you consider "Scan" function difficult?		1	9
The video-audio/graphic content is intuitive enough?	6	4	
Will you need the support of other person for using "Scan" function in other situations?	7	2	1
Do you believe that learning of "Scan" function by anybody would be difficult?	1	3	6
Do you think it is worth to learn how to use the MobileSage service?	10		
Is it useful that the most frequently used function (Scan. Search, Travel) appears in the upper part of the main screen of the application?	10		

- Per se, "Scan" function is easy to use.
- However, the good previous training to use the smart phone and the MobileSage application, better with a human trainer (the caregiver, a relative), is considered essential.

3. Conclusions and lessons learned, extracted from discussions and from the Questionnaire-Interview:

- There was a general agreement on the high utility of the MobileSage application.
- QR code scanning was highly appreciated as very useful and easy to use (with the precondition of becoming more familiar with the smart phone and MobileSage app through sustained previous training).
- NFC code scanning required the user to find the proper position for accomplish the scanning. For this reason, half of them are lesser prone to use this function.
- There was a general agreement that Help function and Phone settings (Font size and Language selection, Information type selection and Screen brightness setting up functions) are very useful, but especially the old end-user needs previous training and personal exercise to easily and successfully use them.
- The MobileSage app icon on the start page of the phone must be made more distinct among the other phone icons: either bigger or brighter, for example.
- The appearance of the most frequently used function (Scan. Search, Travel) in the upper part of phone screen was unanimously agreed as very useful.
- Video-audio and text provided information were the most preferred.
- The participants express the need of getting used to the smart phone as a precondition. This correlates with their opinions related to the questions about

phone settings (font size and screen brightness setting up etc.), language selection etc.

- Phone settings/personalization in terms of disabling those functions/icons not needed by a given user was also suggested.
- Especially the participants with mild cognitive impairments underlined that the app and services it provides are very interesting, highly useful indoor and outdoor and not only for old people, but the reluctance of old people to advanced technologies resides in their fear of not being able to learn how to use them on their own. For this reason, the previous training of the old end-user, better with a human assistant, will be the key to be thoroughly considered by the consortium team (a training protocol or something like this).

1. Annex 1

4.3 Questionnaire-Interview

- **Name initials** …….
- **Age** ……..
- **Gender** ……..
- **Type of the personal phone used** : Conventional / Inteligent
- **Own mobile phone usage:**
  talking, sms, alarm, taking pictures, web surf,

  Date:
  ……

How difficult was for you to accomplish the following tasks :

Task	Degree of difficulty			
	No difficulty	More or less difficult	Difficult	Analysis of results/ comments of participants
Detection of MobileSage icon on the start page				
Access to “Scan”, “Travel” and “Search” functions				
The scanning of the QR code tags				
The scanning of NFC tags				
Obtaining of				

video/graphic information related to system use				
The clarity of video-content	Pore	Good	Very good	
The clarity of graphic content	Pore	Good	Very good	
Type of information preferred	Video-audio	Graphic	Text	
Phone start page use				
The list of results is intuitive enough?		-	-	
“Help” function				
“Travel” function				
“Search” function				
Phone setting functions				
“Emergency call” function			-	
Font size set up function				
Language selection function				

How much do you think to use the MobileSage app and its services?

Question	Frequently	When needed	Not at all
This phone			
QR codes scanning			
NFC codes scanning			
Travel			
Search			
Help			
Font size setting up			
Application settings - Language selection			
Application settings – selection of information type: video, audio, graphic			
Application settings –screen brightness			

setting up			

The acceptance of MobileSage "Scan" function :

Question	Yes	Somewhat	No
Do you consider "Scan" function difficult?			
The video-audio/graphic content is intuitive enough?			
Will you need the support of other person for using "Scan" function in other situations?			
Do you believe that learning of "Scan" function by anybody would be difficult?			
Do you believe that this phone with MobileSage app deserves to learn how to use it?			
Is it useful that the most frequently used function (Scan. Search, Travel) appears in the upper part of the main screen of the application?			

End user signature ……..
Investigators name/signature:
……
……
……..
……
……
……..
……

4.4

2. Spanish Evaluation

1.1 Introduction

In this second evaluation of the Mobilesage application we are testing a much more refined version of the app that shows in great detail the value it could provide to elderly people. In this iteration, in the Spanish evaluation we have decided to use a tourism scenario because we consider it has a lot of commercial potential in this country as well as showing in a clear way, which is the value this application could provide in different situations.

The evaluation has been focused in using QR codes since Telefónica is currently very interested in understanding the level of satisfaction on this proximity technology. The results have been gathered using a standard usability questionnaire, which is evaluating in a high level the subjective perception of the app.

1.2 Scenario Description

In Spain a tourism scenario was selected considering the potential it has for the country and the clear value it could provide to elderlies, which can ease the validation of this technology. When the value is clear, then technology is worth it. In the next paragraphs, the scenario is developed:

María and Paco are from Madrid and they are spending a weekend in Barcelona. They are 68 and 71 respectively and enjoy a very good health. This city has implemented Mobilesage, the new HoD service based on QR codes proximity technology. They are not very prone to technologies and are not acquainted with SmartPhones but in the Hotel they are informed that they can use one of their devices with the app. Only with a short explanation they are ready to use the service. In the morning, after checking the maps function, they decide that they want to go to the Miró museum and they have been informed to take the bus 43. Thanks to the QR code in the bus station, they can scan it and receive the remaining time by means of a locution in Spanish.

When they stop, they find another HELP spot that shows them a map with the route to reach the Museum. María loves Miró and specially one of his paintings, “La Masia”. She finds a HELP spot to get more information about the painting.After walking for a while in the Museum, they find a room where the can watch a video while having a rest in a comfy chair. At the same point, they can obtain the wifi credentials thanks to another HELP spot and check for online news and email on their iPad.

It’s time to have lunch so they decide to take the metro. In the ticket machine there is a HELP spot to show them, which is the best ticket they can buy for the weekend. They buy a special ticket for unlimited trips for the weekend. Once they get to the centre, they walk along different restaurants which have implemented Mobilesage to consult the day menu from the outside the restaurant. They find a good quality price menu and have a very nice meal. Once they finish, they feel very tired and decide to take a Taxi. There is a taxi station with a HELP spot that after QR code reading requests a Taxi and answers by means of a locution in Spanish with the remaining time. In the following picture shows the route they

have taking during the morning. In the appendix are included all the different HELP spots used during the evaluation.

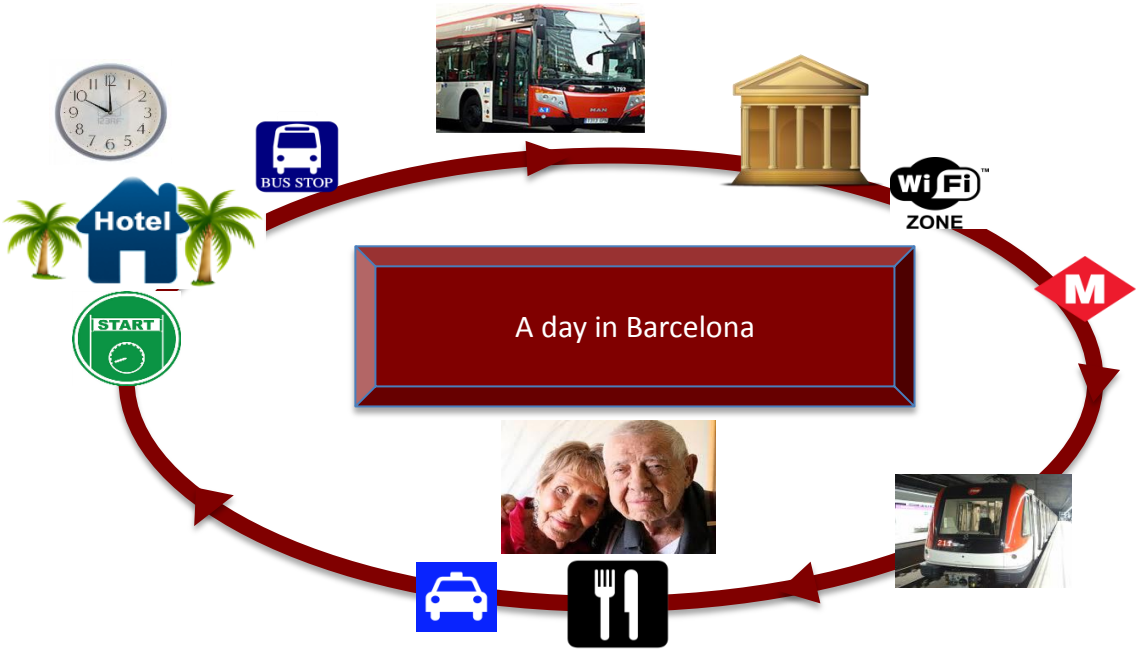


Figure x - Tourism Scenario Barcelona

1.3 Methods and Procedure

In this evaluation, qualitative research was performed using a structured interview approach[1] unlike the focus group that was used in the first iteration. Ten subjects older than 65 years were selected and interview at their homes. A standard questionnaire to measure the application acceptance (i.e. the same one used in the first evaluation) was fulfilled as well as noting the different comments the users were doing about the service and the whole concept of Mobilesage.

The evaluation process was split in two parts. First of all, the interviewer explained a little about the day problems we face when we interact with our surroundings. In order to do that, he fixed the tourism scenario to show different situations where an app like Mobilesage's could provide a lot of value. At this point, he showed for first time the application and made an example of how to scan a QR code. Now, the elderly is ready to handle the SmartPhone and play with the app for a little while. After some minutes when she feels confident, the interviewer conducted the scenario and the user should scan the different HELP spots and find the Miró Museum and Barcelona centre using the maps function. After that, the user answered a list of questions while the interviewer takes notes regarding any relevant comment.

Once the questionnaire concludes, the whole interview was over and the analysis of the information started. A classic approach to measure usability was used by

[1] Paper Methods of data collectionin qualitative research:interviews and focus groups, P. Gill, K. Stewart,E. Treasure and B. Chadwick

using an adapted version of the SUS questionnaire[2]. The analysis is extended in the section "Findings".

1.4 Participants Profile

Recruited subjects should have at least a mobile phone, although SmartPhone was not a requirement to be enrolled in the evaluation. Selected users were elderly people between 65 and 75 without any noticeable impairment. There was only one different recruited subject, who was a 92 years old woman. This case was a specially selected to check the level of acceptance in a much elder person, with some walking impairments but with a very good willingness to learn new technologies such as internet and mobile phones. In the following tables we show a more detailed vision of each of the 10 subjects:

	User 1
Age	67
Gender	Man
Technology predisposition	Good. Internet use, checking bank account and other services.
Mobile phone experience	Good, he's got a Android SmartPhone and installs applications

	User 2
Age	65
Gender	Woman
Technology predisposition	Bad. Even though, she's got internet at home, she doesn't use it
Mobile phone experience	Minimal. She has a basic mobile phone only for calls.

	User 3
Age	69
Gender	Woman
Technology	Normal. She has internet at home and an iPad although she seems to have some sort of

[2] Usability evaluation: http://www.measuringusability.com/sus.php

predisposition	technology barrier
Mobile phone experience	She uses a basic mobile phone for calls and SMS

	User 4
Age	92
Gender	Woman
Technology predisposition	Very good. Even though she is very old, she likes to learn and enjoys looking at the internet
Mobile phone experience	She has a basic mobile phone and uses it for calls and sms

	User 5
Age	67
Gender	Man
Technology predisposition	Very good. He reads the news paper in his laptop, pays money for an online subscription
Mobile phone experience	He is an advanced SmartPhone user. He installs all sorts of apps

The next picture shows one of our users playing with the assistive tool:

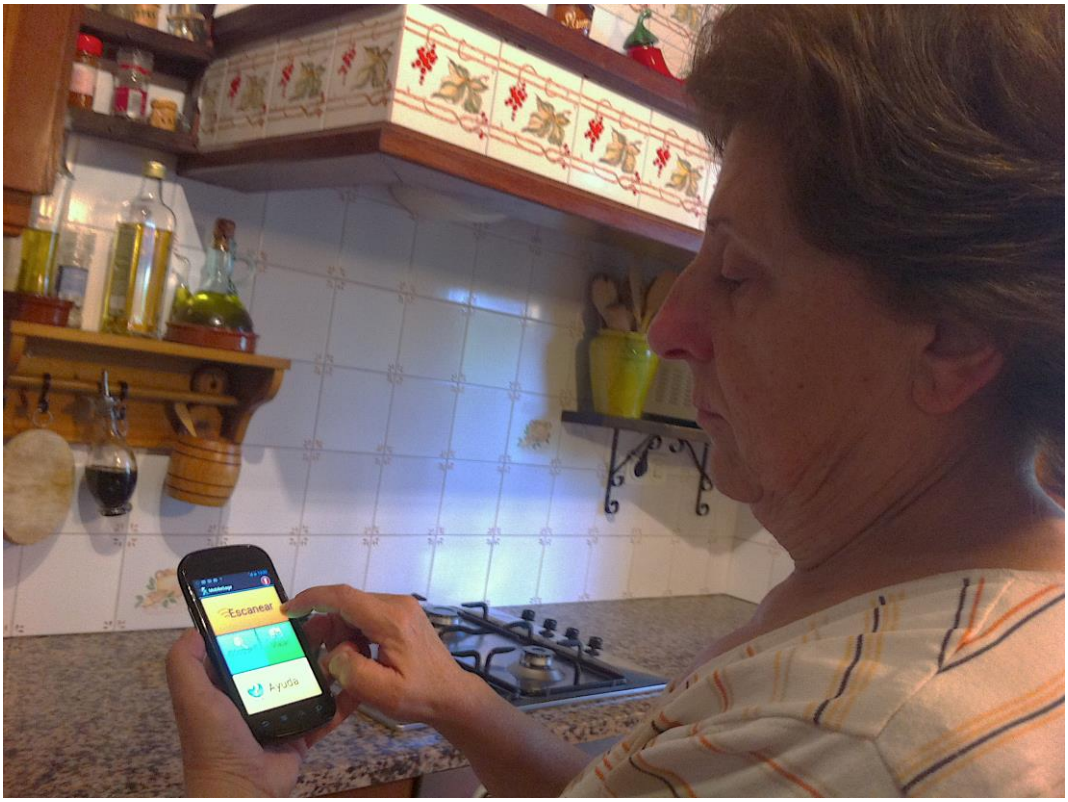


Figure x - User 6 playing with the Mobilesage app

	User 6
Age	66
Gender	Woman
Technology predisposition	Normal. She uses internet and PC in her daily life
Mobile phone experience	She's got a SmartPhone, although she doesn't know how to install apps

	User 7
Age	69
Gender	Male
Technology predisposition	Normal. He uses iPad to browse internet although he's not a super fan of technology but he has a young spirit.

Mobile phone experience	He's got an Android SmartPhone and he knows how to install apps

	User 8
Age	65
Gender	Woman
Technology predisposition	Very good. She read using her iPad, uses Whatsapp to meet with her friends
Mobile phone experience	She's an advanced SmartPhone user and uses many different apps

	User 9
Age	68
Gender	Woman
Technology predisposition	She has good predisposition, uses internet, iPad, although she recognizes it doesn't come naturally to her.
Mobile phone experience	She has a basic mobile phone for calls and SMS.

	User 10
Age	71
Gender	Man
Technology predisposition	Very good. He really likes all sorts of technology and gadgets.
Mobile phone experience	He is an advanced SmartPhone user and has many different apps.

The next picture shows one of our users playing with the assistive tool:

Figure x - User 5 playing with the Mobilesage ap

1.5 Results and findings

After each interview, a questionnaire was filled out for each of the ten subjects. This is the SUS questionnaire, which is a consolidated and accepted way of measuring usability. Questions P2, P4, P6 and P8 where asked in a way that is not needed to rectify scores. The questionnaire is annexed in the appendix. In the next tables, the answers scores for each user and question are presented:

User 1									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
4	5	5	5	5	5	4	5	5	5

User 2									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
5	4	3	1	4	5	4	4	4	1

User 3									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
5	4	3	1	5	5	5	4	4	1

User 4									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
5	4	3	1	4	5	5	4	4	1

User 5									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
5	5	5	5	5	5	5	5	5	5

User 6									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
4	5	5	3	5	5	5	4	5	3

User 7									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10

5	4	5	2	5	5	3	4	4	4

User 8									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
4	4	5	4	4	5	4	5	4	5

User 9									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
5	5	5	4	5	5	5	5	5	5

User 10									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
5	5	5	1	5	5	5	4	5	1

The mean for each of the questions is presented in the following table:

Mean									
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
4.4	4.5	4.4	2.7	4.7	5	4.5	4.5	4.5	3.1

The final processed usability scored in presented bellow:

Acceptance = $(\sum_i Pi)/10 =$ 4,23 (Max 5, min 1)

Compared to the first iteration where the level of satisfaction for the app scored 2,2, the increase after the app refining has been:

Δ Increase = (4,23-2,2)/2,2 * 100 = 92,3% increase of acceptance indicator after the second refinement iteration.

As we can see, the results are outstanding. The fact of designing the mobile application taking into account users' feedback has really had a very good effect. All participants saw a lot of value in an application such as the Mobilesage and would like to use it in a daily basis. All of them, regardless their technical background and predisposition to technology, found the application very simple to use, although it was very relevant to see that the ones that are not into

SmartPhones would need some help for setting up the app and start to use it. However, they feel quite confident that they could use the app after a short explanation. Also, all of them considered that the application was well designed, was consistent and well integrated. The only detected minor problems where when scanning the QR codes, which was a little bit cumbersome.

Also, another problem detected during the evaluation were several application crashes that distressed the users a little bit. The application must be more robust when the time comes for commercialisation.

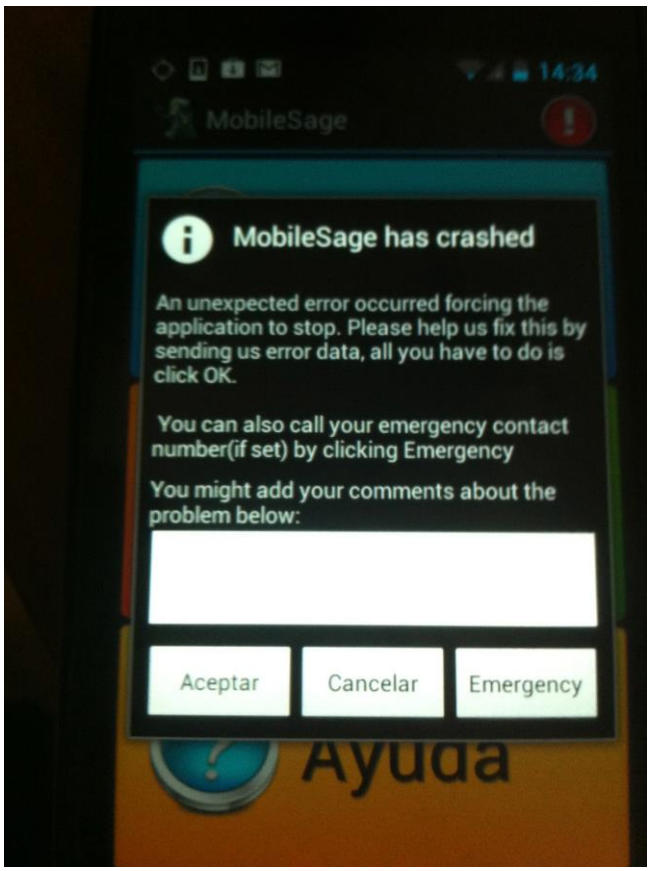


Figure x - App crash

1.6 Conclusions

It is clear that in this iteration usability issues have improved remarkably as the scores of the questionnaires indicate. The observed level of satisfaction with the app is very high but also the perceived value for a Help on Demand service such as Mobilesage. The scan function was seen as the most valuable and it was a little cumbersome for some of the users. Perhaps, some work is needed to improve it a little bit.

We have observed a big difference between users that are acquainted with SmartPhones and the ones who are not. Mainly, the ones that don't have a

SmartPhone would need some help to start. It would be convenient to explore some commercial scenarios where prescribers could take the role of "technical enablers". For instance, in a tourism scenario, Hotel's receptionists could be the people to introduce the HELP on Demand service of the city and show how to install it. Also lending/renting a Hotel's Mobilesage SmartPhone with the app already installed should be explored.

Last but not least, in this last iteration most of the efforts must be put in consolidating the app making it quick and robust.

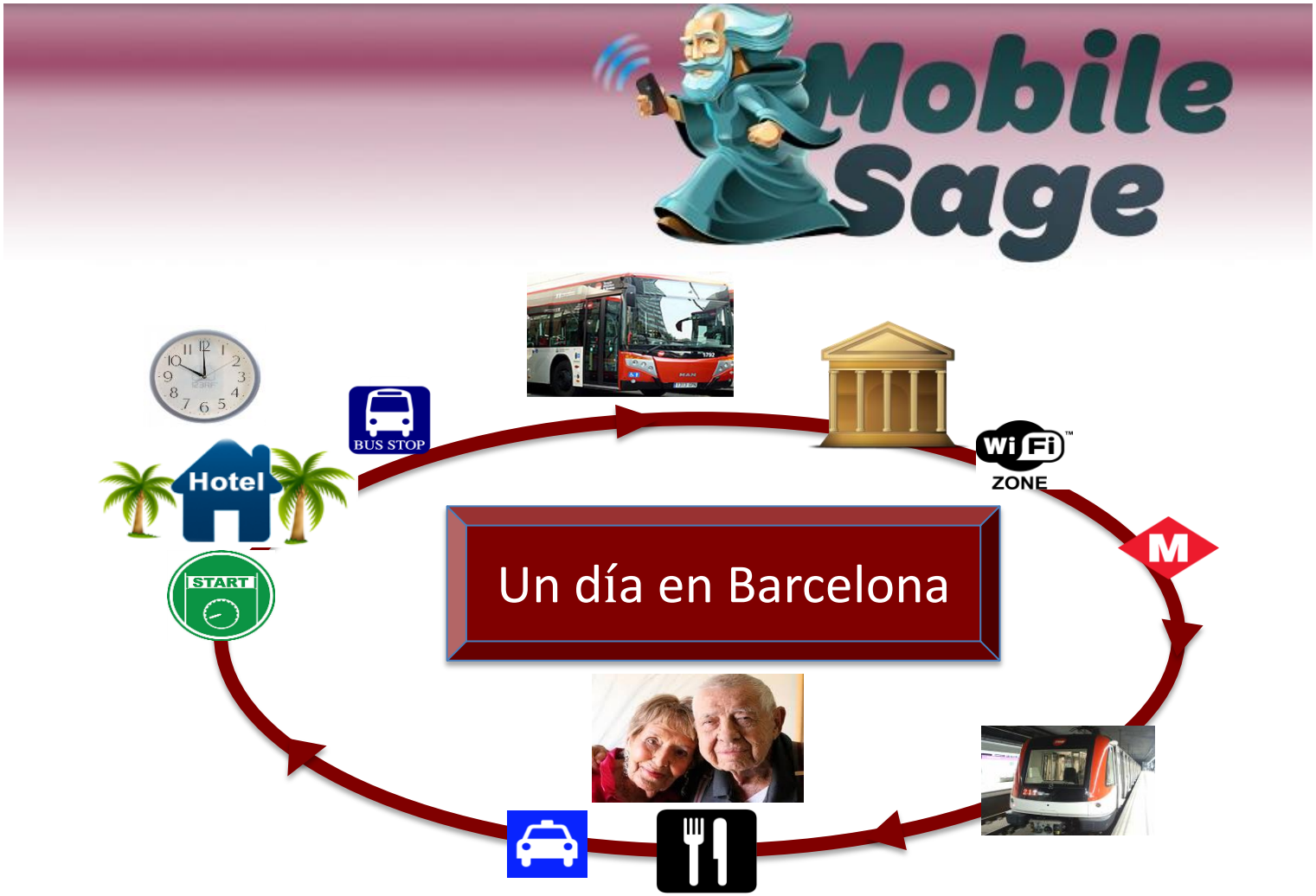
3. Appendix

3.1 Questionnaire

The SUS is a 10 items questionnaire with 5 response options where 1 means strongly disagree and 5 strongly agree.

1. I think that I would like to use this application frequently.
2. I found the system unnecessarily complex.
3. I thought the application was easy to use.
4. I think that I would need the support of a technical person to be able to use this application.
5. I found the various functions in this application were well integrated.
6. I thought there was too much inconsistency in this application.
7. I would imagine that most people would learn to use this application very quickly.
8. I found the application very cumbersome to use.
9. I felt very confident using the application.
10. I needed to learn how to use SmartPhones before I could get going with this application.

3.2 Pilot Sheets



Esperando el autobús

Fin de trayecto parada autobús.
Caminando a Museo Miró

En el museo viendo un vídeo
Introductorio de la exposición

En el museo observando cuadro
“La Masia”

Relax en Zona Wifi del Museo

Cogiendo el metro para ir a Restaurante.
Punto de ayuda al turista al lado de máquina de tiquets

Buscando restaurantes, observando menús

Esperando Taxi en Parada para volver
A Hotel