Social Networking Service for Helping Each Other in the Neighborhoods

A User Experience Approach to the Elderly People

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Abstract— **This research focuses on the use of Social Network Services among the elderly people in Japan, as a solution that could help to bridge the digital divide in that country. It proposes the creation of a Social Network Service for neighborhoods, in which the relationship among the young and the old is promoted. Existing design and usability guidelines for senior citizens and culture-related issues are highly taken into consideration. User-centered design method is applied to tailor the tool for testing. This paper hopes to bring new insights about how elderly people use Social Network Services in Japan and the usability challenges that they face when trying to use it.**

Keywords— Social Network Service; Elderly People; Usability; Japan.

I. INTRODUCTION

The present paper addresses the problem of the aging population as a starting point. This situation affects many countries in the world, but in the case of Japan, is relevant how the population over 65 years old has been increasing year after year. According to the official statistics [1], will become about 30% of the population by 2030.

Although Japan has always been famous worldwide for its great scientific and technologic advances, the statistics show that there is a significant technologic gap between generations. Observing the numbers [2], even though 78% of the population over 60 years old in Japan have a computer, only 23.5% say that use it very often. It is encouraging that over 80% of them believe that the use of Internet is very important. In contrast, in United States of America [3] only 53% of citizens over 65 years old use Internet or email, but 70% of them use it on a daily basis. This remarkable difference shows that having a computer at hand does not necessarily mean its usage.

This papers aims to find a way how the elderly people can integrate better to the Information Communication Technologies. The main Hypothesis is: **It possible through the use of social networks between older adults and younger generations to bridge the technologic gap that separates each other.** It is vital to learn how to design the best user experience, how to successfully improve their everyday lifestyle and how to introduce them in a better way to the digital world. This is a topic that still has not been investigated in full as a possible solution to the digital divide among the senior citizens in Japan.

Some existing services, statistics and researches helped to discover the current state of art. According to the statistics [2], only 7.7%, of the seniors online in Japan use Social Network Services like Facebook, Mixi or Twitter. Among those who use it, they prefer to use Social Networks that include all range of age [4][5] and not those specially made or designed for the seniors (Slownet, Senior Wings, Senior Navi, Senior Com, among others reviewed for this paper). The contrast with the elderly people in America is significant, in which among the active population of senior Internet users, 34% of them use Social Networks like Facebook.

The project "Bring Dich Ein!" in Germany [6], which explores the possibility of the elderly people to post in Internet requests to get favors done around the neighborhood, was a great inspiration to recreate a similar situation in Japan, specially the aspect of geographically limited/closed community and collaboration among them. Parallel to our research with Japanese people, we found many coincidences as the concern for privacy information security and the need of an intuitive design and navigation system. Other similar online services (for example, Ayoudo, Taskrabbit and Kutoto) were also reviewed even they are not specially aimed at senior citizens.

Regarding the use of Internet in general, accessibility barriers that the elderly people go through certainly couldn't be overlooked in this research, specially those related to Independency (to be able to use on their own), Inclusiveness (to be able to use the same technologies as young people) and Terminology (vocabulary easy to understand) [5]. This last barrier, related closely to vocabulary, represented a great concern among the elderly Japanese Internet users.

The paper structure is explained as follows: First, Section II describes the main point that this projects wants to aim. Secondly, the idea generation and selection processes explain the diverse phases that the project went through until now (still ongoing). The background research accounts for not only the bibliographical research but also the field observation and informal interviews. A complete description of the created tool is made, with some examples of scenarios of use is presented in Section IV. Section V

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reports on how the experience with the users was made. The results and some future work are explained in Section VI.

II. Concept

For setting the boundaries of this research, after researching about online and offline communities, it was decided to make the project in a closed environment: the neighborhood. One can see that the neighborhood is one of the most basic forms of communities, preceded by Family environment and School/Work environment. Working with a small scale was vital to manage this research, given our resources. Also, it was decided that we would aim at only those persons who actually used or wanted to use computers, Internet or technology, as it was not of our interest to find a way to change the attitude of people who are not concerned in overcoming the digital divide.

By talking to the elderly people, some initial assumptions were made: First, one of the reasons why some people are not fond of talking to strangers online is because they have never met face to face in real life and they do not share any bond or reason for interacting. But, if that strange person online is somebody they might have seen around in the neighborhood, they may feel more comfortable and talkative. Elderly people are more likely to stay at home rather than young people, so they may know the faces of the people of the neighborhood.

Second, we found that they feel a little ashamed to ask basic questions related to the technologies, ashamed of not knowing.

By questioning how combining the social environment of the elderly people and their difficulties to for using the technology, we tried to create a nexus where they can meet and eventually settle a solution. For this, we created a two-axis framework: First, an ethnographical study, and second, review and test the design guidelines specifically made to this type of user but applied to this kind of situation and in this country. The design guidelines help as a starting point of what expectations should be considered for designing for the elderly people, and, additionally, we want to discover the cultural and language issues that attain only to the Japanese elderly people.

III. Idea generation

A. Idea generation

The idea generation process was inspired by Bill Buxton's book about User Experiences [7]. It is advised that many ideas should be considered at first; for later choosing the best among them. The complete process of deciding which was the best idea to pursue took around one year, meanwhile bibliographic and field research was made.

There were 7 main ideas generated for the kick-off of this project, always focusing on the elderly people (email service, e-commerce system, social network service, dating site, search engine, online dictionary and online learning site), that were considered, compared, refined and some discharged. Two of them were continued for testing and discussion, and later on, the current project was decided.

We found that without a clear motivation it was going to be hard to test if they could immerse in the Internet and Social Network Services like young people do. We discharged the idea of a service similar to Facebook for the elderly people (they were not interested and current services like that do not show impressive results) and other kind of services like a Dating Site did not include as much users as we hoped to test. On a final term, it was decided to follow the concept of weak bonded generations and the emergence of a tool that works as a node to connect people, rediscover the neighbors and harvest a solidarity spirit among them. (see Section IV for a full description on the idea).

B. Background research

Some papers and publications were taken into account for defining the concept and helped to outline the state of art. However, as a reference to design the User Experience, we considered the usability guidelines for the elderly people that exist up to now. The basis are taken from the *Handbook of Human Factors and Ergonomics Methods* [8], which gives a wide foundation to start working on, and the *Web Content Accessibility Guidelines (WCAG)* created by W3C [9].

Regarding the products and services focused on the senior citizens, Docomo's RakuRaku Smartphone [10] was examined, as much as the books by ”Compyuta Obaachan” (Computer grandma), who explains easily step by step how to operate devices or websites (a special publication about Facebook was reviewed) [11]. A few catalogs and shops were visited, in order to survey which are the physical needs that they suffer, and what they choose in order to make their everyday life easier. Design shape, ergonomics, materials, colors and patterns were analyzed. Needless to say, a wide range of websites and phone/tablet applications were searched online regularly, with special emphasize on those that are a channel for communication among users.

Up to now, three interviews were made and recorded with the Owner and Director of “Mamion”**,** Mrs. Mori, who runs a small school in the center of Tokyo that teaches basic informatics specially to the elderly people. Long and substantial discussions about the senior user were made with Mrs. Mori, who gave us her professional point of view and advice about which are their needs, the concepts that they have difficulties with, and what brings them to learn how to use the computer. She also helped recruiting users for the tests (See section V for a the Testing description)

Above all, and constantly, observation of the elderly people was made in public places like parks, cafeterias, shopping malls, trains and post offices. In addition to taking pictures, also was noted how they communicate, body language, how long they take to make simple and difficult tasks (for example, from operating an elevator control to recharging credit in train card or withdrawing money from an ATM machine).

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IV. System Explanation

The concrete tool that is being created, tested and analyzed is an Internet-based Closed Social Network Service for local communities, with a very strong focus on the senior citizens, but where everybody can participate regardless of the age. As a reminder, our main hypothesis is that if old and young people can get together in one virtual space, they can enhance the communication and try to bridge the gap among young and old generations.

The main boundary is that only people from a certain area (neighborhood) can participate, after going through a registration system for verifying the account. Setting this boundary so closed is vital to gain trust among the users and not to fear that outsiders may interfere with their privacy.

Their main motivation expected for participating on the website is helping each other (neighbors helping neighbors) with their needs, doing small favors or just lending a helping hand, where communication and cooperation are the main keywords for making it work, as money is not involved.

The system is called "Manada". It means in Spanish "Large group of animals that move and do things together", Even though the word itself has no meaning in Japanese, it was important to use something easy to pronounce but with a meaning behind that represents the project somehow.

The starting point for conceiving this concept revolves among the idea that young people (younger than 45 years) may already know Social Network Services (Facebook, Twitter among others) and are familiar with this kind of communication technologies, but older people still do not. For some of them, it may be difficult to understand the concept of an online Social Network because the relationships "face to face" are their main way of communication.

This is a very simple scenario of use to illustrate the idea: User A is an old lady who needs some help for a certain task that she can not do because of a physical difficulty. She posts the message asking for help (This posts are called *"Onegai" , which means "a favor" in Japanese*) and waits for a reply. User B is a neighbor who lives very close and sees the *"Onegai"* posted in the Social Network. He replies and helps her. Another example shows that Seniors can also help, and not only receive help: User C is a young housewife who posts an *"Onegai"* on the Social Network Service, and it happens to be something that User D, even though being much older, can do perfectly. He replies and feels good knowing that he can still be useful for someone.

Next, it was important to start making the first tests to evaluate the concept and check if the communication and support across or inter generations is possible through the Social Network Service, creating bonds within the community, and build a theory based on that findings. As many as possible existing design guidelines are being tested and put in practice, in order to verify their validity or not among the Japanese users.

V. Testing experience

According to the user-centered design [12], it is important to include the final user as soon as possible in the design process, in order to analyze their needs and hear their opinion. That is the reason why, after making the first design attempts, it was vital to meet some users, hear their opinion, ideas and test their abilities with our tool.

A. Users

A basic Persona was created to serve as a guide for finding subjects for the test:

1. Be 65 years or older;
2. Be an active user of the computer, without any education restriction, and
3. Japanese native.

B. Testing

The testing was conducted in September and October 2013 in Tokyo and Kanagawa, Japan. Three users were students of the Informatics School "Mamion" and the other two subjects were contacted separately (Fig. 1). Some testings took place at the school and some at the house the users for their comfort.

The users at the School were two men (69 and 83 years old) and a woman (73 years old). They were active students of the School and were taking courses because of different reasons: want to keep updated (still feeling young), want to fight boredom, or communicate with family abroad. The other pair of users (Male, 75 years old and Woman 74 years old) did not go to class but learned alone and with the help of their families.

Before starting the test, they were asked to complete a form with some personal information (name and age), and multiple choice questions. On the first question they had to answer what terminal they could use (Personal Computer, smartphone or iPad) because we were concerned to know if this kind of project was worth to be applied for mobile terminals. We also asked about the use of Internet, because we were interested in discovering if they used it for socializing and communicating with others or if they did other activities. The next question was about exactly which Social Network Services they used (if any), mentioning the most famous in Japan (Facebook, Twitter, Mixi, Line). Also, it was vital to know who they talked to through internet, mentioning from the closest friends and family to unknown people. Next part was about the knowledge they had about words and icons: They had to check the words they knew about the Internet vocabulary. Some of them were "Download" or "Home", but also other words that appear in the Japanese version of Facebook, for example "Share" or "Activity log". Also, we asked them to write the meaning of seven icons that are ordinarily used online and offline, for example, "telephone", "mail", "comment", "print", "delete", "edit" and "accept". Lastly, we asked how they came over the difficulties they find in Internet, if they turned to

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someone (and who) or if they solve it themselves (and how). This questions were key to lay a ground and better interpret their actions during the testing.

They were asked to read a short explanation of what was the test about and how it was going to be conducted. On the last page, it was detailed what they had to do: *"Imagine that you are Mr/Mrs Akai, and you have just bought a new TV. You have no idea how to connect the cables, so you use Manada Social Network Service to ask for help to your neighbors and see if someone has time to help you"*. Three pictures were shown to help them to imagine the situation: A photo of a new TV, a photo of an instruction sheet, and finally an old person scratching his head with a lost look. This set of pictures was on sight all the time, as a reminder of what they had to do.

Many doubts were cleared before staring and, in order to to follow the Think Aloud technique [13], they were encouraged to say aloud about what they were thinking about while doing the test. All the sessions were recorded by camera.

The testing was made using the technique of paper prototypes (Fig. 2) [14]. The prototypes were made using Adobe Illustrator and had the appearance of a high definition wireframe.

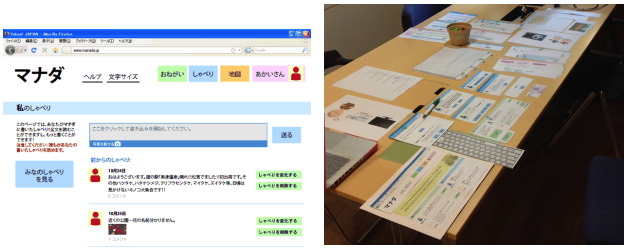

Figure 2: Paper Prototypes

All the text written was readable text (not dummy test) in Black color 14pt font. Buttons were colored boxes of rounded borders with the text in bold. Each part of the website was represented with a piece of printed paper. The only part that was always visible was the Internet Explorer bar and the Website's head menu. The width of the paper "screen" was of around 25 cm. They touched with a finger the buttons to imitate the mouse click.

Each test lasted around 20-30 minutes with each participant. It was intended to make it short in order not to exhaust the mental concentration of the individuals.

All of them completed the task (to post an *"Onegai"* on Manada) on the expected time satisfactory and were relieved to hear that they did everything correctly, even though it was informed to them that it was fine to fail. The wrapping up was followed by some oral questions regarding what they think about the concept, if they would use the Social Network Service and finally if they felt that it was easy or hard to use.

VI. Conclusion and Future work

1) According to the questionnaire answers, they were not familiar with the use of Social Network Services in general; so, they did not select any. Also, they indicated that they communicate only with friends and family, what proves right our initial assumption that they do not talk to strangers. As expected because their lack of knowledge in Social Networks, words like "Share" and "Update" were also new for them (The Japanese equivalent was used for the testing), as the results with the icons that are related to posting and editing comments. Regarding the difficulties in using the Internet, they seem not very keen on asking for help, they prefer to find the answers alone searching online.

2) When explaining the task, it was very useful to show pictures to help them imagine the situation. Visual aids were important and it was vital to take the time to explain the same thing several times as they forgot or could not understand it at the first attempt. This is something that we will keep on using in the future testing.

3) They mentioned on the closing talk that they felt it was still difficult to understand how the system worked, even though they could read very clearly all the texts. There were some doubts about the button's labels and titles, specifically when they had to manage their *"Onegai"* they did not understand whether the *"Onegai"* was finished or not once they posted. In other words, they could not grasp the dynamics of an Social Network Service completely.

4) The majority of them thought that this kind of service would be very useful and would like to try it "in real life" but they fear that not many elderly people are familiar with the computer, even themselves feel a big insecurity when facing the possibility of having the ability to use it or not.

Regarding the Usability functionalities that are being affected in this research, so far the Learnability factor is the one that is being more compromised. Users not only have to learn how to use the website but also understand a new concept which is how a Social Network Service works. Additionally, because of their age and lack of english education in their school days, they have serious difficulties understanding the Internet Vocabulary, which consists mainly in English words written in Katakana: a sound transcription of foreign words that do not have an equivalent in Japanese language. Also the Memorability factor is affecting due to the use of foreign words, given that they have to learn by heart not only what action is expected after clicking a certain word but also not being able to associate that word to any known synonym in their own language. Keeping in mind the fact memory decline is normal among senior citizens, this represents a double challenge.

The next step in this work in progress is to make a new design iteration to solve the difficulties presented during the test. An extra focus will be made on the labeling, as many common vocabulary was avoided because japanese elderly people may not be familiar with english words. The total elimination of Katakana words is impossible, but better suitable synonyms should be implemented. This was an obstacle expected to arise, so is the difficulty that it presents.

Moreover, it is necessary to keep on working on the interface, in order to put it in a simpler and friendlier way, expecting to make them feel that they have the ability and confidence to use it.

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Also, with this test, the paper prototype phase is considered finished to move on to an electronic interface to be tested on the computer. One of the subjects pointed out that if the test was made on the computer it "would not be so easy"; so, we are looking forward to test on a digital device in the next design iteration with at least 15 users, rising the prototype fidelity and adjusting even more the design.

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Figure 1. Users taking the test in Tokyo and Kanagawa

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