Learning to use new technology for the elderly

Magdalena Velciu[1], Luiza Spiru[1], Vasilis Giannoglou[2], Evangelos Koulis[3], Mircea Mărzan[1]

(1) Ana Aslan International Foundation,
Spătarului Street, no 3, RO-020771, Bucharest, ROMANIA
(2) GeoImaging Ltd, 6 Georgios Seferis Street, Nicosia 1075, CYPRUS
(3) AgeCare (Cyprus) Ltd – Materia Group
Athalassis 41, Latsia, Nicosia 2221, CYPRUS, E-mail:
magda.velciu[at]anaaslanacademy.ro

Abstract

The outbreak of Covid-2019 and the subsequent quarantine reminded us that new technologies make a real difference to people's lives and help them lead a better, healthier, self-satisfying life at home. This article aims to explore how learning to use new technology for the elderly can be helpful in order to encourage them to stay healthy at home and safe when going out. Are the elderly ready to become more familiar with new technologies and use them in daily activities?We present here the IOANNA application that helps senior users feel safe to walk around the city, find an interesting temporary job or community service, and continue being active citizens. Besides, IOANNA provides a friendly interface for finding stores close to their location, organize their shopping, and find special offers. The results from the pilot tests we deployed have shown us that people over 65 years old, with different IT literacy and with/without previous experiences with technology, have a great interest in using the app features and functionalities because they are aware of the real benefits of using it in their everyday lives. Sometimes, they need help setting up and learning to use the app. But this is not an insurmountable barrier for the elderly if they are self-motivated, and the perceived usefulness is high. If IOANNA app is to be adopted on a large scale, then we have to focus on showing the benefit gained from using the app. Also, training instructions have to be customized to elderly needsThis document provides you with detailed guidelines for producing and submitting your print ready proof for the proceedings. The document is written in accordance with the instructions, which should be followed carefully.

Keywords: ICT's for the elderly, healthy aging, learning to use

1 Background: Using ICT's in a post-pandemic world

Worldwide, the ICT's industry was playing a key role in fighting against the pandemic. The post-pandemic world will be different and the barriers that had previously slowed the mass using ICT's in education, working, health, etc. will be removed. People of all ages will rapidly integrate technologies in their daily lives, from staying in touch with friends and family members, or daily activities to satisfying vital needs such as health, consumption, and education.

The COVID-19 pandemic has a negative impact, especially on the elderly defined as people aged 60 or 65 years and over (ECDC, 2020). This applies especially to those whom were compelled to stay at home and endure serious constraints due to the major health risks of infection. Social distancing and isolation can have a negative effect on their physical and mental health.

…what about ICT's for Healthy Aging

There are 101.1 million people aged 65 years or more living in the EU-28. During the next three decades, the number of older people in the European Union (EU) is projected to follow an upward path, peaking at 149.2 million inhabitants in 2050; their relative share of the total population will also gradually increase and is projected to reach 28.5 % in 2050. (Eurostat, 2019).

It is undeniable that the ICT's has the potential to be of considerable use to older people, innovative products are developed for the elderly like health and wellness apps, safety services,

apps that educate elderly, etc. Many ICT solutions supporting active, safer and healthy ageing are implemented. The ICT's use can be beneficial to the elderly (or seniors) in many ways. For example, "Livewell" project (Boulos, M. N. et al, 2017) attempts to address this issue, and also adds a component of social networking and peer support to its educational provision to help patients and their family combat social isolation and depression. Research evidence also shows that Internet use and online social engagement can protect against health literacy decline during aging (and hence result in better health outcomes), independent of cognitive decline.

Moreover, there are many benefits of continuing learning something new. Studies show that when seniors learn a new skill, such as learning how to use new technology, it reinforces the healthy brain and it keeps dementia away. It is very beneficial for the elderly to continue to acquire new skills or to do new things. Learning is an important aspect of aging productively (Gillian M, Boulton-Lewis, 2006) and mental stimulation.

Despite the benefits of using ICT's, there are also constraints and challenges seniors face when using new technology. Previous E.U projects (The Home Sweet Home project, 2014) shown that from the perspective of older users of ICT's, the main difficulties of usage are listed under five main items: the need and understanding the benefits of technology using, the usage and accessibility, the trust in technology if they do not understand, the affordance in terms of the cost, and the perceived usefulness or "how will it change my life"? Also, iterative testing, using tutorial and training also, of the devices for some time before adopting them, allows older persons to experience the benefits of technologies that can help them gain confidence in using and start adopting them.

Also, the understanding of the elderly user experience is paramount to enhance their acceptance and adoption of the new technologies (Spiru L. et al, 2019). So, the elderly need to learn to adapt to the new digital challenges and learn how to use and share information. Even if, some of them are learning and using technologies for the first time.

Research (Paul C. at all, 2019) about factors affecting seniors' acceptance or rejection of newly technologies found that gerontographics segmentation can tremendously inform on the openness of the seniors towards certain products or services. Seniors who are independent and socially active, namely the categories of healthy indulgers and ailing outgoers, are open only towards new technologies and avoid age stigmatized gerontechnologies and health-oriented products and services, while the categories of frail recluses and healthy hermits, who are more self-isolated and dependent, are more open towards new technologies and gerontechnologies alike.

1.1 Paper Contributions

In this article, we intend to see how the elderly learn technology by using it, if this can be helpful in order to encourage them to stay healthy at home and safe when going out. For people with no experience with technology, learning how to use is paramont in order to better turn knowledge into a real-valued product.

This article aims to explore how learning to use new technology for the elderly can be helpful in order to encourage them to stay healthy at home and safe when going out. Are the elderly ready to become more familiar with new technologies and use them in daily activities?

We present here empirical evidences we received through experimentation with the IOANNA application. The main findings we obtained during pilots/ field trials, concerning the above-mentioned problems are detailed. The primary objective is to assess the readiness of seniors to accept the app, if do they need it? As a secondary objective, we intended to see if there are any difficulties the participants might experience while interacting with the app. It is learning to use a difficulty for them? What can we do?

2 The IOANNA apps - facilitating mobility and social engagement of elderly

The integrated solution IOANNA is developed under the AAL project Integration of all stores Network & Navigation Assistant (http://www.ioanna-project.eu/) as a platform and mobile phone/tablet application for facilitating mobility and social engagement of the elderly. The project's services are based on the following pillars, as follows: a) Search for commercial offers, stores, stores categories, and specific products of services near the user's location b) Offer community service in paid or volunteer basis for experienced senior adults.

IOANNA will collect all the information needed from local professionals, to create a database that will be dynamically updated to build a network of almost all stores in town, with product and services details whenever possible. Local professionals will be able to sign-in to the application and upload any offers they may currently have, so that the users can arrange their shopping lists. That way the users will be able to see if there are any good offers nearby this week that they would miss had it not been for IOANNA. From the seniors' perspective, while finding the optimum price compared to how far the shop is, may not be their main concern, they do care for being able to wander around the town feeling safer in case something unexpected happens to them. A panic button is available that automatically calls their family if pressed and a fall detector will do the same if the user falls down. In addition, users will know if there are any interesting jobs or community services, they can offer their services and they would appreciate the fact that they can now be independent, giving them self-confidence for the small every-day challenges. On the other hand, seniors are familiar with some few places in the neighborhood, but their 'known area' tends to be smaller and smaller. IOANNA's challenge is to help them stay up-to-date, engage them in local activities, help them to have a larger window on the world and bring them in contact with other people in a safe and secure way.

Local stores, would greatly benefit from IOANNA, as they may become known, or even advertise themselves through the platform by posting their offers and prices. That way, even smaller stores may shine in the competitive market, despite their low budget cycle of work, especially during the pandemic times that it's more difficult to visit the actual stores.

Moreover, the public sector and other local professionals (companies etc) may take advantage of IOANNA platform and post openings in places that need the labor or expertise of senior adults or other citizens, for limited time, as a volunteer or paid work. Those offers will be presented in a different way than the product or services offers and the platform will support the interface through which the two parts will come in contact. This way, people with enough free time will have the chance to offer their valuable experience and remain active citizens in the case of seniors, or maybe acquire some valuable experiences through those offers an enrich their CV in the case of other citizens. At the same time, the public sector or other professionals will greatly benefit from that particular service, as they will have their offers seen by a big network of people, being able to choose the right person for the job. Engaging community services will offer "community credits" to be reimbursed through IOANNA.

3. The methodology, results and discussion

Before implementing the mobile app on a larger scale, we want to see how elder users interact with the prototype. The involvement of the end-users is an important factor to develop a mobile app that is user-friendly, easy to use, and easy to learn to use. Also, elder users' feedback will be used to manage the difficulties and facilitators to learning to use technology (i.e. mobile application). We present here selected conclusions on requirements and field trials of the first prototype.

Users' requirements. In September–October 2018, we invited seniors from Cyprus and Romania to express their opinion. The inclusion criteria for seniors is age over 55 years, with low

or minimum/high IT literacy levels, living in urban or rural areas, also being interested in using the opportunities of IOANNA and its services. Method. We applied semi-structured questionnaires (collecting responses from 47 seniors) and deep-interviews with 10 seniors We presented them a short description of the IOANNA concept and its services and a mock-up and ask their opinion. The results show us that seniors feel comfortable using IOANNA app and would be happy to use it daily if they are aware of its benefits. Easy to use interface with friendly images and good visibility even is necessary. A step by step tutorial with learning instructions would be highly appreciated. The safety is the main practical barrier that people perceive it to prevent the daily use it.

Real-life trials. In January-February 2020, the first prototype was tested with seniors involvement, in two countries, Cyprus and Romania. For the investigation, we asked seniors to test the prototype and give us their feedback, comments, and suggestions on how to improve the IOANNA system to respond to their needs. A total of 30 participants was involved in both end-user countries; 15 in Romania and 15 in Cyprus. The inclusion criteria are age over 55 years with special attention for those 75+ years and different levels of IT literacy, i.e. no, low, or minimum/high. The method: The participants were guided through one experiential learning scenario and their respective tasks to navigate through all the functions of the mobile application. Experiential learning is the practice of learning by doing. It encourages people to use technology, even if they do not have previous experiences or how to use a computer. The tools: observation, semi-structured interviews, and questionnaires. The results: Most of the older adults in Cyprus and Romania said they had a good experience and found the application interesting and useful, with some particularities. The willingness to use it is dependent on many factors and parameters like age, IT literacy level, and area of residence. In Cyprus, many adults of older age (75+) liked the application but found it hard to use it and/or did not want to use it. However, as the researchers observed, older adults of more than 75+ years of age in Romania showed little interest in learning how to use IOANNA and its functions.The IT literacy level of older adults highly affected their opinions. For example, the majority of the older adults in Cyprus stated that they found the application difficult to navigate. This point is related to the need of some kind of training material. In Romania, older adults with no IT literacy are not interested in the application at all. Older adults living in remote areas in Romania were more negative towards the IOANNA application. By contrast, older adults in rural areas in Cyprus have more acceptance towards the application than those living in semi-urban areas.The results from the 30 participants also highlighted the most important areas for improvement for the application. Some notable examples included: a. some kind of training and tutorial on the application, b. to include a voice recognition function, c. bigger fonts and icons, d. options for communication between the users and e. a function to compare the prices of the stores in the application.

4. Conclusion and future work

We consider that the readiness of seniors to use ICTs is a complex process, highly dependent on other reasons. There are important influential factors we cannot adjust, as demographic factors, geographical factors, and factors we can influence like psychological factors (e.g. motivation, perception, etc.). While the readiness to use the app is essential, one prerequisite to its use by the elderly is that the system is easy to use and matches the needs of older adults. The process of development of new technology for the elderly has to involve the elder users to confirm that products are addressing the real needs of the elders. They can learn technology by using it. The issues are not about the willingness to use it in everyday lives, but lack of practical experience. If they feel confident, they will be more likely to view the beneficial and accept to learn how to use

the technology. We consider that using the app for some time and seeing its benefits first hand might change elderly opinion. This is why we will proceed with the longitudinal study, in subsequent stages of development. We assume that elderly learn to use and become more confident with technology simply because they used to use it in their daily activities. Also, there are some concerns in terms of privacy and ethical issues that required a particular approach. This is essential to protect the elderly, their rights and data privacy, throughout the complete cycle of development, from creation to market launch and implementing the mobile app on a larger scale.

References

Boulos, M. N., Ifeachor, E., Escudero, J., Zhao, P., Carroll, C., Costa, P., Doppler, G., Marín, L. C., Spiru, L., Guðmundsdótti, K. H., & Kosem, M. (**2017**): LiveWell – Promoting Healthy Living and Wellbeing for Parkinson Patients through Social Network and ICT Training: Lessons Learnt and Best Practices. In Management Association, I. (Ed.), Health Literacy: Breakthroughs in Research and Practice (pp. 430-445). IGI Global.

Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – eleventh update, (August 2020): European Centre for Disease Prevention and Control, Stockholm

Eurostat (2019): Ageing Europe - looking at the lives of older people in the EU, retrieved from https://ec.europa.eu/eurostat/documents/3217494/10166544/KS-02-19%E2%80%91681-EN-N.pdf/c701972f-6b4e-b432-57d2-91898ca94893

Gillian M. Boulton-Lewis, Laurie Buys & Jan Lovie-Kitchin (2006) Learning and Active Aging, Educational Gerontology, 32:4, 271-282, DOI: 10.1080/03601270500494030

Paul C., Sterea A., Mârzan M., Economidou A., Žilavec I., Spiru L., Gârleanu A. (2019) Why Do Seniors Accept or Reject New Technologies? Towards Developing a Seniors Oriented Technology Acceptance Model, In *Proceedings BRAININFO 2019*: The Fourth International Conference on Neuroscience and Cognitive Brain Information

Preventing problematic internet use during the COVID-19 pandemic: Consensus guidance, retrived from https://www.sciencedirect.com/science/article/pii/S0010440X20300225

The Home Sweet Home project (2014): ICT for ageing well: Listen to what older persons think! Retrieved from https://www.age-platform.eu/sites/default/files/ICT_for_ageing_well.pdf

Spiru L., Paul C., Velciu M., Voicu A. and Mărzan M.. (2019) Understanding Elderly User Experience on the Use of New Technologies for Independent Living, In *Proceedings of the 2019 International Conference on Health Informatics & Medical Systems- HIMS'19*, U.S.A.

Varma, V. R., Tan, E. J., Wang, T., Xue, Q. L., Fried, L. P., Seplaki, C. L., King, A. C., Seeman, T. E., Rebok, G. W., & Carlson, M. C. (2014). Low-intensity walking activity is associated with better health. *Journal of applied gerontology, the official journal of the Southern Gerontological Society,* 33(7), 870–887. https://doi.org/10.1177/0733464813512896

World Health Organization, (2015) World report on ageing and health 2015, retrieved from https://www.who.int/ageing/events/world-report-2015-launch/en/