USER-DRIVEN APPROACH TO PROMOTE THE USE OF HEALTH AND WELLBEING TECHNOLOGY AMONG ELDELRY PEOPLE

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Abstract

Almost every country in Europe is tackling today with the huge challenges of ageing society and ageing population. Year 2012 European union was launched the theme active ageing and the Program for Active and Healthy Ageing was published as "The European Year for Active Ageing and Solidarity between Generations 2012" [1]. From the point of view elderly people as senior citizens there is still a need for supporting elderly people´s health and wellbeing through the development of the new health and wellbeing technology, eHealth and especially through new digital services [2. The digitalization is spreading rapidly reflecting on all levels of the society and especially people´s everyday life. The elderly people as users, clients or patients in the field of health care and social welfare should be taken actively along when technological products and new digital services are developed. There is a challenge to develop technology and digital services that enhance and make possible to be generated a new ecosystem in health care and social welfare context to respond the needs and expectations of the elderly people living independently at their own homes. Cities or municipalities, companies, academic institutions, and professionals from public and private healthcare and social welfare field and e.g. elderly people as endusers should cooperate for co creating better user-driven and age friendly technology and services.

The purpose of the article is to describe how elderly people can be involved as active participants when new health and wellbeing technology are taken in use in health care and social welfare field. The research focus is on action research (AR) as the methodological background. Through the user-driven methods during the cocreation process the elderly people are committed in developing and using the technology, technological products and digital services. The article is based on a case study called the mHealth Booster research, development and innovation (RDI) project as the example. The aim of the mHealth Booster project was to design and produce new development environments as interactive and participative test and demonstration environments for and with the elderly people and professionals from the cities of Espoo and Vantaa in Finland. The development environments are physical spaces where different health and wellbeing technology, products and services were tested and developed together with the elderly people, the professionals, and the companies. In the mHealth booster project elderly people and professionals were in an active role in the cocreation and development process. The voice of the participants is crucial in empowering the eldelry people in their own life and in empowering professionals in developeing their own work. In the presentation the findings of the mHealth Booster project will be described based on the phases of the action research and the role and engagement of the elderly people will be shown thorugh the case study.

Keywords: Action Research, engagement, empowerment, elderly people, livinglab, mHealth booster, user-driven methods

1 BACKGROUND - TOWARDS BETTER HEALTH AND WELLBEING OF THE ELDERLY PEOPLE

Europe is tackling today with the huge challenges of ageing society and ageing population because ageing population is growing rapidly almost in every country. The theme active ageing was launched by European union in the year 2012 [1]. Also the Program for Active and Healthy Ageing was published (1) in the same year. In that year the content of the programme in many countries focused on elderly people´s health and wellbeing, active life and possibility to live independently at home. The ultimate idea was that elderly people themselves are able to participate actively in the development of the better ageing society. There are many ways to take elderly people with the development processes for planning age friendly environments, cities which enable an independent and dignified living. From the point of view elderly people as senior citizens there is still a need for supporting elderly people´s health and wellbeing through the development of the new health and wellbeing

technology, eHealth and especially through new digital services [2]. The digitalization is growing rapidly and it reflects on all most every level of the society, actions in the society and especially elderly people´s everyday life.

The elderly people as citizens, users, clients or patients in the field of health care and social welfare should be taken seriously along when new technological products and new digital services are developed and tested. There is a huge challenge to develop new technologies and digital services that enhance also a new ecosystem in health care and social welfare. This kind of innovative and flexible ecosystem can respond positively the needs and expectations of the elderly people living independently at their own homes. Actors such as cities, companies, academic institutions, and professionals from public and private healthcare and social welfare field and elderly people as users should have a deeper cooperation for designing new interventions, products and platforms for solutions supporting independent living, accessibility and availability of new technologies and digital services. [3]

From the methodological point of view an action research, Living lab methodology and user-driven methods are relevant when various actors are cooperating together in research, development and innovation projects (RDI). Action research as the methodological approach is congruent with the Living lab methdodology especially when the aim is to test and to develop new products, solutions or services or to produce new knowledge how to cocreate products and services with users in real life. The cyclic process of the action research is strongly anchored in real life situations. Living lab methodology and user-driven methods integrate also academic institutions in solving real life problems and support co-operative networking with working life, companies and real users. For public sector the participation in RDIprojects offers possibilities for sociatal innovations and new interventions in their service actions.[3].

2   USER-DRIVEN APPROACH AND ACTION RESEARCH AS A METHODLOGICAL BACKGROUND

2.1   *Action research as a methodology*

Based on the literature, the action research is seen either as methods or as a methodological approach [4] [14]. Action research is based on critical knowledge interests and its goal is to produce a new knowledge and new forms of practice [6]. The basic principles of action research are practicality, actors´ participation and the creation of new activities or interventions related to the concept of change. The cyclic process of the action research is strongly anchored in a real life. [7] [8]. The process of action research is systematic and includes reflective way to get a deeper understanding of the content and the context [10] [11].

Action research is used in real life situations, rather than in experimental study contexts, since the primary focus of action research is on solving real problems. It can be applied by multidisciplinary research groups for the pilot research, especially when the situation is practical orientated. Action research is chosen when circumstances require flexibility, the involvement of the people as actors in the research, or when the change must take place quickly or holistically. Often those who apply action research as an approach or methods are professionals e.g. practitioners who are aiming to improve understanding of their working practice or researchers who are cooperating with organizations towards research based change. [7].

Action research analyses the background of actions, reflects on and develops alternative solutions to problems for achieving the objectives, and produces or interventions, new knowledge and operating models [12] [7] [13]. Action research is based on critical knowledge interests - the goal is to produce new knowledge and forms of operation [6]. The basic principles of action research are practicality, subject participation and the creation of new activities, methods or interventions related to change. [7].

The action research process implies that the subjects of research are active participants in the change and research process, that the research is practically oriented, and that the process is cyclical, transforming planning, action, evaluation and reflection. Fig.1. The cycle of the action research is described by Reason and Bradbury [14].
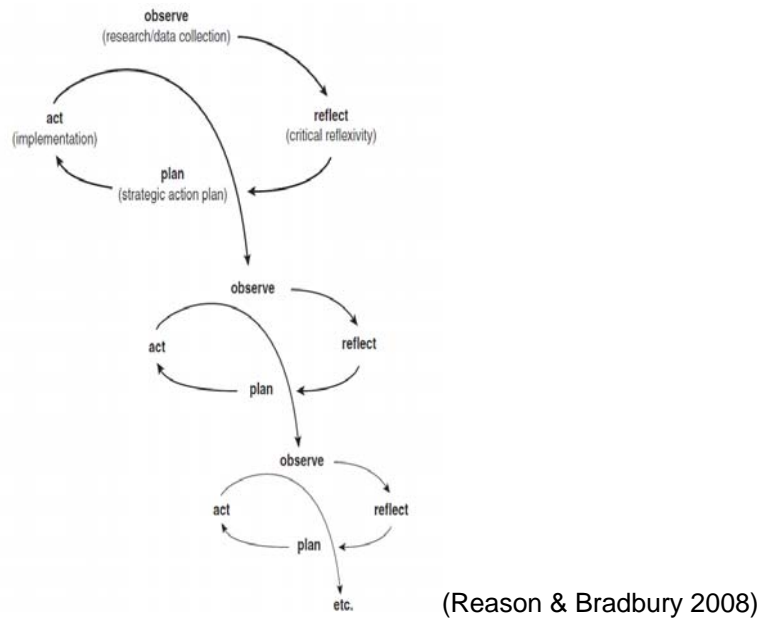
(Reason & Bradbury 2008)

Figure1. The cycle of the action research

2.2 *Action research applied in a case study* Ageing Society

mHealth booster was a project funded by the European Development Fund (ESR) and the Centre for Economic Development, Transport and the Environment of Uusimaa Finland. The project was implemented by Laurea University of Applied Sciences during August 2013 to December 2014. The objectives of mHealth Booster was to design and produce new development environments for and with the elderly people and professionals from the cities of Espoo and Vantaa in Finland. The development environments were physical spaces where different health technology products and services were tested with the elderly people as users, the professionals, and the companies. [3].

In mHealth booster three user-driven development environments have been designed and implemented, where the products and services can be tested together with the end users, the companies, and the experts. In addition to testing, the development environments were used for educating, guiding and instructing the experts and the personnel working with elderly people. In the development environments of the City of Espoo the users and experts could guidely familiarize themselves with the health technology products and services. The environments in the City of Espoo were located in the Soukka Service Centre and in the Tapiola Health Centre. The idea was that all development environments are close to the elderly people in order to them easily visit and participate in the demonstrations and testing of the products. [3]. A preventive perspective was emphasized in all of the activities and test situations. Various thematic events and user trainings for clients and their significant others have been also organized. The technology development environment in the City of Vantaa was the Technology Library, which is designed for active seniors and their relatives. The Technology Library was located in Tikkurila Library. In the Technology Library, the users and experts could be guided and they could familiarize themselves with the health technology products and services, and in addition to testing the products on-site, the users could also borrow products for testing at home for a longer period. [3].

Living lab is a network that integrates an user-centered research and an open innovation [15]. Living lab is an environment that offers future directions of the product development based on users´ experiences. A product development can be connected in new products, services, applications through a cocreation process. [16] [17]. Leminen and Westerlund [16] defines Living labs as physical

regions or virtual environments where public-private-people partnerships, companies, academic institutions and users create, test and validate new products and services in real life situations.

The benefit for the companies participating in Living labs is crucial because of rapid business markets. For public sector the involvement offers possibilities to societalinnovations and totally new interventions in their service actions. A Living lab methodology and user-driven methods integrate academic institutions in solving real life problems and support co-operative networking with working life and real clients. Living labs are the contexts enabeling RDIprojects where the process is implementaed.

In the case study mHealth Booster the development environments were based on the Living Lab approach. The development environments were planned, implementeaed and evaluated together with the users, professionals and entrepreneures in real life situations. With the action research, in the development environments of mHealth booster the products and services were planned, co-created and produced together with the actors.[3].

3 RESULTS OF THE MHEALTH BOOSTER PROJECT- ELDLERY PEOPLE AS USERS

3.1 Elderly people as users in the context of health and wellbeing technology development environments as Living Labs

As a data for this article the mHealth Booster RDIproject have been used as a case. The project was based on an action research and user-driven methods. The purpose of the research project was to study, design and produce development environments utilizing the health and wellbeing technology and to evaluate how the development environments increase the awareness of the health technology and support the well-being and health of the elderly people in the everyday life. The participants of the study were elderly people (n=70), professionals (n=20) and the entrepreneurs (n=20). The average age of the elderly people was 76.54 years. [3]. Elderly people were the main informants of the research and they were actively participating in the process of the action research. The data was collected by interviews, focus groups interviews and workshops using user-driven methods. Action research was applied as a methodology for designing the development environments together with the elderly people, the experts, and the companies. Especially the elderly people tested, evaluated and reflected new technological products and developed new activities in different phases of the action research process. Also, during the action research process various situations in the context of technological solutions were disclosed and the need for re evaluation was necessary. It was important that the elderly people were engaged for the purpose to change something and simultaneously to increase understanding and new knowledge of activities and modification of the health and wellbeing technological solutions used at home.

Companies participating mHealth booster project could utilize the development environments in real time e.g. to get online feedback of their products and services with and from the users. Elderly people testedthe products e.g. promoted their safety at home. Technological develoment and new plans for the integration done by entrepreuneurs were one of the characteristics in enbaler-driven Living lab type.Typically enbaler-driven living lab is representing on public sector e.g. muncipalities, non-govermental organizations and finaciers [16]. Regional or societal needs are on the focus. Professionals from health care and social welfare field are able to get newest information of health technology and they can test these products in development environments or direct in their own work. This kind of testing is adding the competence using health technology and positive attitude towards health technology. Educational institutes and universites are the actors in provider-driven living labs where research, education and knowledge transfer happen. Provider-driven Living lab consisted of experts´ knowledge and competence shown as e.g. tested virtual services. The most crucial is that enbalers make possible physical environments as Living labs contexts. The coordination and the research are the main tasks that enabled the iterative process of the project and are named under the provider-driven Living lab. University of applied sciences are quite often the main partner and responsible for the reserarch and development work in the projects. In mHealth booster Laurea University of Applied Sciences is responsible for the project and is leading the actions in the development environments. mHealth booster enables students to learn and gain the modern competences of the health technology. Also students are able to work and cooperate with the users, professionals and entrepreneurs. [3].

User-driven living labs are based on users or usercommunities where solutions for everyday life problems will be investigated and found. Actions and activities in user-driven living labs are informally organized and the process is based on bottom-up approach. [17] User-driven Living lab includes actions and interventions towards elderly people´s participation and activity. Their expectations and the feedback are the basis for the cocreation and development of the products or services. During the chosen research methods, workshops and during the free discussions in test situations the active role of the elderly people can be seen and taken into account. In mHealth booster all actors were active and participate in the development environments and also in workshops and demonstrations where they tested and gave the feedback of the products and services of the health technology in the context of their own life situations, own homes and working life situations. Based on the analysis, there were some main characteristics such as cooperation and network based roles and actions which representad simultaneous qualifiers and can be seen as an integrative covariance in Living labs.

3.2. Elderly people´s participation and engagement

3.2.1 Emerged themes as the basis for the solutions

The aim of the data collection during the first phase of the action research was to assess and identify the needs and the expectations of the elderly people and experts in order to grasp the meaning of users´ point of views. The data was collected through the focus group interviews in which both elderly people (N=70) and experts (N=20) participated. [3].

The data was analysed using qualitative inductive content analysis. [18]. The following themes were grounded from the data:

- loneliness,

- lack of mobility and physical activity,

- unsafety,
- health problems, and
- lack of knowledge, ability and skills in self-care.

The themes represented also those main problems which the elderly people are facing in order to cope at their own life safely. The need for the development environments based on the data was obvious for producing real solutions with and for elderly people. Development environments as physical spaces and as testing platforms were co created together with professionals, entrepreneurs, researchers and users. The findings of the collected data were the criteria when the health and wellbeing technology products were chosen to offer and demonstrate in the development environments. The design of the development environments was also based on the data from the workshops with the companies. The products and services were clustered and integrated based on the themes above as the findings. For example, there were three different companies offering the solutions for supporting elderly peoples´ mobility and safety at home or outside the home. These three solutions were tested by elderly people themselves and by their family members. Elderly people who had for example memory problems were able to test first the products in the development environments with their family members and after that at their own homes. [3].

According Hyysalo [20] in a user study, the emphasis is on systematic collection and refining of personal experiences, and the user's participation in the product development process. User data gives enables information about the characteristics, features, forms and aesthetic qualities of a product or service as perceived by an individual or a group. The situation, relationship with other people or items, and earlier experiences can provide user data for research purposes. In addition, user data can be collected by examining the experiences, visions and assumptions of designers, although collaboration with users is increasingly common. The idea is to examine test situations where both the user as a client or a customer and the expert is cooperating together.

User studies are usually based on qualitative research methods. In addition to conventional methods such as one-to-one interviews, focus groups, observation and participant observation, data can be collected using methods such as stories, diaries, thinking aloud, video recordings, images and drawings [20]. In user study, observation refers to monitoring the user in his or her own environment to collect information about the user, his or her activities and user environment, and details about the product's use. [20].

3.2.2 Characteristics of engagement

During the action research in mHealth Booster project the collected data was analysed from the perspective of user participation. The Grounded theory method and especially Six C`s method [22] was used for summarizing users´ role and the characteristics of participation. The following themes were emerged from the data: timing, mutual understanding, shared knowing, rhythm and holistic schema.

The timing as a key concept includes an integration of the actions of the everyday life such as congruence with the personal routines and habits of the elderly people. Decisions made by elderly people themselves are the basis of the timing and reflect the deeper meaning of the engagement and participation of the elderly people. The mutual understanding as a concept enables deeper relationships and an intensive interaction between the elderly people and other actors. It means that the chosen issue or the topic should be reflected and repeated several times in order to link the experiences, thoughts and desires in the content discussed. The mutual understanding is crucial when guiding and supporting elderly people to take and use health and wellbeing technology products or services in their everyday life. The shared knowing as a concept is the continuity of the timing and mutual understanding. The characteristics of the shared knowing are the process and the elements of acting. A unique encounter and a shared experience are required for deepening relationships and an interaction. These are essential parts of the nature of the shared knowing.

The rhythm is a multidimensional phenomenon. It can be described through the mental and the situational point of view in elderly people´s everyday life and situations. The mental rhythm reflects that the meaning of the new issue, new thing or feeling is anchored through the real life context or situations. Active and participative engagement are the main features describing the role of the elderly people. The holistic schema is emerged from the characteristics and features and integrates the concepts mentioned above. The holistic schema represents a main category or even a main process explaining the engagement of the elderly people. As a main process of the elderly peoples´ engagement the holistic schema shows that elderly people are active participants, they master their own thinking, feeling and living. This can be seen when the elderly people invite others to involve their own life and everyday situations.

4   ETHICAL ISSUES TO BE CONSIDERED WITH THE ELDERLY PEOPLE

Permission for mHealth Booster research was sought in accordance with good research practice both from Laurea University of Applied Sciences and the Ethics Committee of Federation of Universities of Applied Sciences (FUAS). Permission was granted also by all participative municipalities. The Ethics Committee of Federation of Universities of Applied Sciences reviewed and approved the application for research permission. The ethical research guidelines and practices were strictly complied with during the project.[3].

The research participants were elderly people who lived at home or in service houses or visited and used day centre services. Since all participating individuals and groups were ethically challenging, vulnerable and sensitive, the ethical aspects of the study were closely checked and the participants' rights were vigorously protected. Research participants were requested to provide informed consent. The purpose of the study and the rights of the participants were explained before the participants signed the informed consent. Particular consideration was reflected during the data and in test situations. During the project the attention were paid to ethical and legal rights, confidentiality and ensuring that participants were not harmed at any time. [23] [24] [25] [26]. The research data was carefully stored during the research process and it was destroyed at the end of the project. The research findings are documented and reported with care.

5   CONCLUSIONS AND DISCUSSION FOR THE FUTURE

This paper presents the role and particiaption of elderly people as users in the research project where the purpose was to cocreat and develop health and wellbeing technology in the Living Lab context. Elderly people should be taken serviously account when the development processes are planned, implementaed and evalauted in the health and wellbeing field. Eldelry people are active and engaged when they are participating in the projects.[3] [9] [10]. They are committed when unique encounters and relationships actualized as the findigs of the case study mHealth Booster showed the evidence.

Still the existing challenges relate to develop and cocreate more deeply health and wellbeing technological solutions to response the expectations and needs of eldelry people as users and client groups in the field of health and social wlefare. The aim is also to correspond with the availability of

digitalization of services [2]. There is an important challenge to support the productisation of the health and wellbeing technology and to create new business models in health care and social welfare field. A modern and successful transfer of the health technology and products requires close collaboration and cocreation with local authorities, private and public sector, thrid sector, service providers, companies and users. Living lab methodology and action research are congruent when the cocreation process happens for planning the new products and services, for supporting the availability of services, and for renewing the development of new client and service processes [28].

The future challenge for the research is to examine more eldlery people´s health and wellbeing supported by the smart technology, agefriendly environments, user-driven solutions in real Living lab context. The research should also focus more on how to develop academic programme and education towards a future orientated way to integrate multidisciplinary competences to respond the challenges in a modern society e.g. towards an agefriendly society and world.

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