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DIGITAL WELLNESS SERVICES FOR “YOUNG ELDERLY” A MISSED OPPORTUNITY FOR MOBILE SERVICES

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Abstract

The ageing population of Europe is a concern for political decision makers and visions on how to deal with the issues are being debated. The issues raised concern elderly people, the age group 75-90 years, but not much thought is given the “young elderly”- the age group 60-75 years – as the serious age-related problems are not visible among them. Nevertheless, pro-active preventive action programs among the “young elderly” could significantly reduce the problems society faces when people become elderly. Digital wellness services offered over omnivore platforms on smart mobile phones and backed up by analytics tools over cloud services are proposed as effective interventions to build wellness routines. The design of wellness services need to be with the young elderly, not for the young elderly.

Keywords: digital services, wellness, “young elderly”, ageing population.

1 Background and Introduction

Europe is facing the challenges of an ageing population, which is experienced in different ways in different EU member countries and is met with different types of action programs. A common denominator seems to be that ambitious structural changes are outlined to meet the challenges, often in visionary and elegant strategic plans and political programs (cf. for instance, the H2020 visions) that appear to be well-intended but not well-founded with respect to facts and are hard to develop into realistic action programs. The approaches we discuss in our country are not much different; they appear to be mostly focused on some isolated problems or the needs of some specific group as there happens to be some technology available that could be tried out and some influential group takes a fancy to that technology – after a while not much has happened and the results remain at the pilot stage.

We will address the issues with the ageing population from the perspective of digital wellness services that are designed, produced and offered over mobile platforms.

Research work on mobile services (cf. [7] for a summary) shows that with mobile technology there are good possibilities to build and implement action programs, that (i) will have an impact for individual citizens, that (ii) will spread and grow to groups of citizens, then (iii) will become a movement engaging hundreds of thousands of people in a country, and (iv) will move into first several, then many countries, to finally (v) become a global movement. If we apply this scenario to digital wellness services – and elderly people adopt the services and turn them into wellness routines – then this will have, through sheer numbers, an impact on health and social care costs for the ageing population. If the wellness programs touch a few million people of the ageing population, the impact on the health and social care costs in the EU will be in tens or hundreds of billions of Euro annually.

The “ageing population of Europe” is a broad and ill-defined segment of the population. The issues appear to be deteriorating health conditions of the 75+ aged citizens and how a modern society should cope with them, i.e. the aim and the vision is to neutralize and/or compensate for the effects of deteriorating health. The reality is that this needs to be carried out with cost-effective, tax-funded programs. As the proportion of ageing citizens is growing in most EU countries – relatively seen fastest in Germany, Finland and Italy – there is growing political pressure to find trade-offs between the costs of the care programs and their substance (read: quality) as the tax-paying part of the population may not be able to afford the programs from the year 2030 onwards (cf. [18]).

Thus we need to find another way. The first step is to focus on pro-active prevention, i.e. to find measures that will reduce the growth in the numbers of 75+ aged citizens that will need the health and social care support of the society; proactive prevention puts focus on the age group called “young elderly” – the age group 60-75 years – and develops programs that will keep them healthy, active and independent when they reach the 75+ age group. We need to develop tools (the second step) that can be used for intervention – applications for mobile smartphones are now becoming and will be general purpose instruments by 2020 (the mobile connection subscriptions are more than 100% of the population in most EU countries; the proportion of smart phones have passed 60% in most EU countries). The third step should develop ecosystems that will maintain and further develop ICT-based tools to support the programs for the young elderly. This three-step approach requires, of course, political commitment and social consensus in each EU country, but blueprints of alternative ways to build the programs can (and should) be worked out with research programs.

Given this outline we will next add a few more elements of substance to the context description.

The young elderly age group represents 18-23 % of the population in most EU countries (cf. [18]); this is a large segment of the population that according to recent statistical estimates will be about 97 million EU citizens by 2020. The age interval [60-75] is, of course, not cast in concrete, the effects of age are individual and the ageing process is different for different individuals, in different cultures and

in different countries. However, most people retire from working life around the age 60 and studies show that this change has an effect on their future health scenarios; other studies show that the daily routines of the young elderly have effects on the health scenarios for the 75+ age group [23].

Functional impairment covers cognitive, physical, social and emotional impairment. [24] Our work with young elderly groups in a research program called BeWell (cf. [5]) has shown that functional impairment is (i) multi-dimensional, (ii) compensatory and (iii) non-static. Physical impairment is an unnecessarily narrow focus as there are many more aspects to the well-being of the young elderly, and most (or all) of them have impacts on the future need for health and social care. Functional impairment is non-static; i.e., it is a dynamic process that changes in its multiple dimensions – some parts being mutually supportive, some parts being compensatory – and the dynamics having some relations to the daily routines of the young elderly [24].

The choice of *wellness* is motivated by the fact that wellness services will not be dependent on health or social care data that is strictly regulated in most EU countries, with country-wise differences, and with confidentiality and privacy limitations.

If digital wellness services become interventions in the daily routines of young elderly they will support the forming of daily wellness routines. Over time – the building and adoption of new wellness routines will take time (cf. [19]) – this will have a measurable impact on the health and social care costs. In common sense terms - if in Finland more than 900 000 young elderly citizens will have better health for 10 years or more, the effects on health and social care costs should be several BE annually (the health and social care cost for the elderly was 3.8 BE in 2014).

In BeWell the wellness routines are assumed to work out in the following way: (i) young elderly will develop individual daily wellness routines supported by wellness services on an omnivore platform over mobile smartphones; (ii) the wellness routines will be tailored by/for the users from 100+ smartphone applications; (iii) cloud services will support the wellness routines and collect and analyse user data for further and continuous development of wellness services. If the program will shape up in this way remains to be seen; the details on the technology are worked out in section 5.

Our interest in digital services for young elderly was triggered by the reactions from service developers and providers when we asked them why there were no mobile services developed for the young elderly (cf. [7]): *“they give us the wrong image”, “it will take too much effort to develop services in such a way that elderly people can use them” and “for what purpose would the elderly use mobile services?”*. As the young elderly represent up to 23% of the consumer market in most EU countries it appears that some strategic mistakes were made. Studies of the use of mobile phones and services among the older adults start to appear (cf. [25], [26]). Several studies in the UK (cf. [25]) show that older adults (over 50 years of age) use mobile phones significantly less than younger people; the older adults use them for maintaining and developing social relationships and for providing health and security services. Studies show that older adults are “passive users” – using mobile phones when there are no alternatives; there is a general lack of understanding of the functional impairment experienced by older mobile phone users (displays too small and difficult to see, buttons and characters too small causing errors, too many functions to keep track of), older adults fear the addictive effect that is manifest in the younger generation. In a similar study in Germany (cf. [26]) the research design called for a sample of mobile app users in three age groups: “youngsters” [- 25 years], “middle agers” [26-49] and “best agers” [50 + years]; they found significant differences between the age groups with an UTAUT-like model: (i) convenience has a strong effect on perceived usefulness among the “youngsters”, has less effect among the “middle agers” but slightly stronger effect among the “best agers”; (ii) for the older groups convenience is not important for enjoyment, but it is for the “youngsters”; (iii) perceived ease of use has significant influence on enjoyment and intention to use among the “middle agers” and “best agers”; (iv) for “middle agers” enjoyment is significantly influenced by the perceived quality of a mobile app and perceived ease of use; (v) enjoyment is most important for “middle agers” and moderately important for “best agers”.

In this paper we will test the visions we have of a forgotten, very large and potentially very important market for digital wellness services for the young elderly with some of the hard reality of actually designing, building, launching and sustaining the use of digital wellness services. We need answers to some key questions:

Q1: Will young elderly be a relevant user group for digital wellness services?

Q2: Do young elderly find wellness issues important?

Q3: Can digital wellness services form wellness routines? What should be the service design?

Q4: What environment can sustain wellness routines for the young elderly?

After this rough storyline of how digital wellness services for the young elderly are motivated and how they could become reality, we will develop the storyline with more facts and constructs in the next sections. Section 2 is a brief overview of digital business and digital wellness services; section 3 is a similar overview of young elderly; section 4 works out key elements of wellness services; section 5 presents technology platforms for digital wellness services; section 6 reports first results of the work with young elderly user groups; section 7, finally, summarizes and makes some conclusions. We are finding answers to Q1-Q4 but we do not yet claim that we have a complete model (or theory) for the building of digital wellness services for the young elderly.

2 Digital Business in 2015

Digital business is simply defined as the transformation of key business processes through the use of internet technologies (cf. [8]). The definition suggests that a simple approach with simple means will be sufficient, but practice has shown that the innovations and implementation work needed to build new business with new technology is much more demanding. For the moment we will not get into that, but build on the understanding that we will have to transform business processes to the needs of digital wellness services if we want them to offer viable platforms for very large groups of young elderly users.

Digital wellness services for the young elderly has the potential to become a disruptive intervention in the common wisdom on how to tackle the problems with an ageing population: it will be a pro-active, preventive program, it will promote wellness routines and change daily routines, it will improve health scenarios for elderly people and reduce public health and social care costs. It may help rewrite the whole context as Wikipedia changed the encyclopaedia industry, as Skype introduced peer-to-peer Internet telephony and the Voice over Internet Protocol with a disruptive impact on international telephony, and Facebook created new standards for social networks and social group interaction. It will have a significant impact because the number of people involved will be very large.

The mobile technology has become an increasingly important part of digital business and is now starting to be a dominant technology in some of the developed markets. The original notion was the mobile commerce that was simply understood as electronic commerce carried out over mobile phones (which was not a very successful notion in the early 2000s, cf. [7]). The breakthrough came with the mobile apps that introduced new ways for users of mobile phones to download and use digital services that required none of the professional skills needed to search for and operate internet-based services. The first apps were not very effective, nor user-friendly, but the advances in smart mobile phones have offered better and better platforms for more advanced, multi-functional and user-supportive applications.

An update from June 2015 (cf. <http://bit.ly/smartmobilestats>) shows that the use of digital media over smart mobile phones now has passed the use over desktops and laptops in the US market and is dominating the use of digital media. The trends are similar in the developed EU and Asian markets; then it makes sense to aim for digital business solutions to be worked out with smart mobile phones as the user platforms.

Internet Usage (Engagement) Growth Solid
+11% Y/Y = Mobile @ 3 Hours / Day per User vs. <1 Five Years Ago, USA

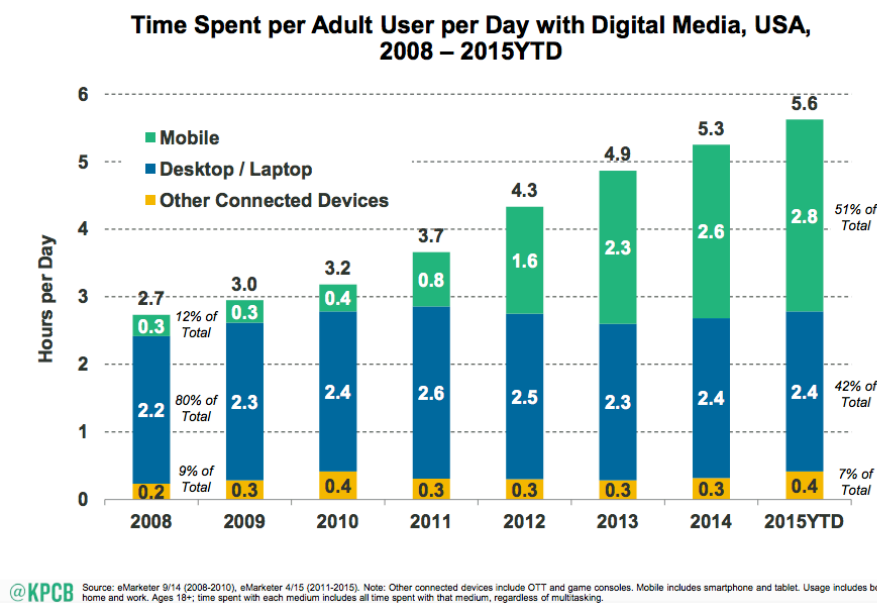


Fig.1 Mobile Internet Trends 2015

The digital transition of business has created a number of surprises for the business world. It is said (Helmut Krcmar in keynote to the 24th ISD Conference in Harbin) that the digital transition is: (i) inevitable, (ii) irreversible, (iii) tremendously fast, but (iv) uncertain in execution. Digital business will take over as it is both more effective and efficient than standard business practice, more productive (more products and services with less production time), more cost-effective and more profitable (more value produced with less production time) and – consequently – offers much higher return on capital invested. We did not actually expect the transition to be as fast as it has been and many well-established, old and successful corporations in traditional industries were taken by surprise (cf. [8]). Digital business is opening markets for innovative solutions to digital services, business models and ecosystems. This is where digital wellness services for young elderly should/will be heading – aiming for winning (mobile) platforms, using innovative business models and creating ecosystems of companies with high levels of productivity and cost effective operations. This is a first answer to Q4 – *the digital business provides the tools and the environment for building sustainable digital wellness services, which will be a prerequisite for sustainable wellness routines for the young elderly.*

3 Young Elderly – Part of the Ageing Population

For the young elderly [60-75] age group the society needs to have a strategy with priorities which are – and need to be – different from the strategy and priorities for the old people. Programs for the ageing population appear to focus on the senior [75+] and the elderly [85+], at which stage the focus needs to be on care to deal with (often severe) functional impairment and chronic illnesses. These are stages that can be avoided with pro-active preventive wellness services for the young elderly.

A majority of the young elderly is healthy, active and socially interactive and do not require much intervention or support from the health and social care systems; for a minority of the group we could claim that health, activity and social interaction are not so good. These classifications are deliberately vague because they change from country to country, and the interpretations of them differ between countries and cultures.

The young elderly (+ elderly) is a large age group in Finland, and according to the forecasts it will be 22.6% of the population by 2020:

| Year | Population | 0–14 | 15–64 | 65– | 0–14 % | 15–64 % | 65– % |
|-------------|------------------|----------------|------------------|------------------|-------------|-------------|-------------|
| 1900 | 2 655 900 | 930 900 | 1 583 300 | 141 700 | 35,1 | 59,6 | 5,3 |
| 1910 | 2 943 400 | 1 049 400 | 1 724 500 | 169 500 | 35,7 | 58,6 | 5,8 |
| 1920 | 3 147 600 | 1 051 000 | 1 908 300 | 188 300 | 33,4 | 60,6 | 6,0 |
| 1930 | 3 462 700 | 1 018 300 | 2 227 200 | 217 200 | 29,4 | 64,3 | 6,3 |
| 1940 | 3 695 617 | 995 599 | 2 464 107 | 235 911 | 26,9 | 66,7 | 6,4 |
| 1950 | 4 029 803 | 1 208 799 | 2 554 354 | 266 650 | 30,0 | 63,4 | 6,6 |
| 1960 | 4 446 222 | 1 340 187 | 2 778 234 | 327 801 | 30,1 | 62,5 | 7,4 |
| 1970 | 4 598 336 | 1 118 550 | 3 052 298 | 427 488 | 24,3 | 66,4 | 9,3 |
| 1980 | 4 787 778 | 965 209 | 3 245 187 | 577 382 | 20,2 | 67,8 | 12,1 |
| 1990 | 4 998 478 | 964 203 | 3 361 310 | 672 965 | 19,3 | 67,2 | 13,5 |
| 2000 | 5 181 115 | 936 333 | 3 467 584 | 777 198 | 18,1 | 66,9 | 15,0 |
| 2010 | 5 375 276 | 887 677 | 3 546 558 | 941 041 | 16,5 | 66,0 | 17,5 |
| 2020 | 5 631 017 | 932 596 | 3 425 603 | 1 272 818 | 16,6 | 60,8 | 22,6 |
| 2030 | 5 847 678 | 936 712 | 3 415 342 | 1 495 624 | 16,0 | 58,4 | 25,6 |
| 2040 | 5 984 898 | 923 027 | 3 495 360 | 1 566 511 | 15,4 | 58,4 | 26,2 |
| 2050 | 6 095 858 | 940 800 | 3 515 618 | 1 639 440 | 15,4 | 57,7 | 26,9 |
| 2060 | 6 227 635 | 948 631 | 3 523 775 | 1 755 229 | 15,2 | 56,6 | 28,2 |

Table 1. The proportions of the ageing population in Finland by decade (cf. [16])

From the simple fact of numbers it can be seen that the Finnish society faces some challenges in terms of health and social care if more than 1.2 million citizens need care when they get older. The cost of health care for the ageing population in Finland was 3.8 B€ in 2014; as a rule of thumb it is said that a Finnish citizen spends 80% of the health care costs (s)he spends during a lifetime during the last 10 years of his/her life. Thus much can be gained if the young elderly build up good wellness routines and stay active with them also as seniors and elderly.

Finland, Germany and Italy have the least favourable age pyramids among the EU countries, which mean that the challenges with the ageing population will first become obvious in these countries. Seen from the perspective of potential for digital wellness services and supporting technology the EU countries represent a large and growing market; the estimate is that the young elderly will be 97 million in EU by 2020 (cf. [19]). Then we have a second answer to Q4 – *the impact being formed by the ageing population will make it a necessity to build and sustain wellness routines.*

4 Digital Wellness Services

The WHO defines wellness as “the complete mental, physical as well as social well-being of a person (or groups of persons) in achieving the best satisfying or fulfilling life and not merely the absence of disease or any form of infirmity (cf.[20]). There has been quite some debate over the years about the dimensions of wellness; one of the most complete lists includes: (i) emotional, (ii) financial, (iii) occupational, (iv) environmental, (v) intellectual, (vi) physical, (vii) social and (viii) spiritual wellness (cf. [1], [10], [11], [12], [17]).

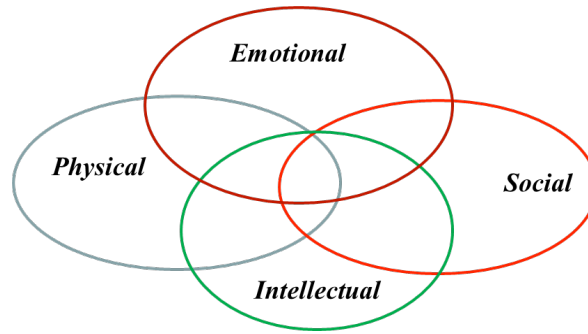


Fig.2 Four dimensions of wellness

There are some benefits in operating with wellness in a four dimension construct (cf. fig.2): (i) intellectual wellness, (ii) physical wellness, (iii) social wellness, and (iv) emotional wellness, which mirror functional impairment dimensions. In our work with young elderly groups we have learned a few things about wellness. Even if it is accepted that building physical wellness is beneficial there is assumed to be a “reasonable” level which does not require daily exhortations. It is reasoned that an “overall wellness” can be maximized by compensating some missing level of physical wellness with improved intellectual wellness, or with improved social wellness, or with improved emotional wellness (or with any combination of these). It will of course be a challenge to find some good trade-off, mapping relations between the wellness dimensions, and then to create digital wellness services to support and sustain them.

In several studies of mobile services (cf. [7] for a summary) we have found fault with the traditional service design for some intended potential users, who then are expected to learn how to get the service, how to get it started and then how to adapt their own routines to make use of the service. Digital wellness services for young elderly need to follow a different roadmap as we have found out that the young elderly are unwilling to spend time to adapt to requirements they do not find meaningful (this was also found in [26]). The wellness services need to be designed *with* the users, not *for* the users. The methodology for that is multi-disciplinary action design research [ADR] which is now gaining support as a key methodology in information systems research (cf. [13]). With the ADR we work with multiple, sizeable groups of wellness service users, both to identify necessary design variations and to collect the data on the forming of wellness routines. In workshops and field experiments we try to show that new, enhanced and regular wellness routines (interventions) will reduce the risk for advancing [physical, cognitive, social, emotional] impairment. In work with service developers and providers we build models to show that investment in digital wellness services will have high return on investment for (i) the service providers and technology developers in an ecosystem, (ii) for associations of the young elderly, (iii) for society, and (iv) for the individual young elderly themselves, but the return is probably not measured in monetary terms.

The design of digital wellness services works with data that is multi-dimensional and covers the four wellness aspects. Part of the data needs to be in real time; part of it can be daily and weekly summaries and some of the data should work through interfaces to health care systems. All of it should be summarized and offered in an understandable (probably tailorable) form for young elderly users over smart mobile phones (operating in Android, iOS and Windows). These requirements are our present understanding of how the digital wellness services should be made operational.

5 Enhanced Digital Wellness Services

A digital wellness services program for the young elderly in the context outlined in this paper can be expected to quickly get hundreds of users (as it is backed up by the associations of elderly), soon turning into thousands of users and then scaling up to tens or hundreds of thousands of users in a fairly short time. The technology infrastructure needs to be planned for very large groups of users;

technology developers and providers clearly want the user groups to grow to millions of users in all EU countries.

The first choice to be made is to either work with modular platforms built from existing components or to design and build the platforms from unique, original constructs; the ADR approach (cf. [13]) to the development of digital wellness services builds on (i) service co-creation with the users in semi-structured workshops, (ii) flexible, adaptive designs that adapt to changing needs and requirements, (iii) new designs that adapt to and make use of technology innovations, and (iv) flexible, adaptive infrastructures that adapt to changing contexts. The ADR approach favours quick piloting and prototyping which is easier to carry out with platforms that are composed of existing components. We use the Wellmo omnivore platform and the Tieto cloud service platform as development environments.

Wellmo is called an omnivore platform (“eats everything”) because it interacts with 100+ digital devices and applications, which is useful for building a large set of wellness services and adapting them to user needs; the Wellmo was first developed by Nokia and then turned into a spin-off that was launched in the B2B market as a basis for corporate wellness programs offered to employees (cf. fig.3 for an overview of the features). The links (cf. fig.4) cover most of the key fitness brands and devices.



Fig.3 The Wellmo omnivore platform



Fig.4 Wellmo connected devices and applications (selection)

The Wellmo platform has gone through several development cycles and its functionality has been extensively tested; it is in active use by more than 40 corporations in half a dozen countries. In the step

from the corporate to the young elderly market the omnivore platform is developed with a focus on usability to meet the needs of the ageing population (this has not always been recognized as important, cf. [25] for data from the UK). The tracker and the connected device portfolio are expanded to cover devices and applications used on the intellectual wellness side; the API is enhanced to support real time linking to external functions on top of the Tieto platform and the scalability is enhanced to cope with very large user groups.

The back-end infrastructure builds on the Tieto cloud services platform for advanced analytics (cf. fig.5) which supports the design, implementation, monitoring, verification and validation of the digital wellness services. The platform offers a full stack portfolio for different types of digital wellness services combined with a cloud IaaS to support modern services such as automated adaptive coaching and advanced analytics.

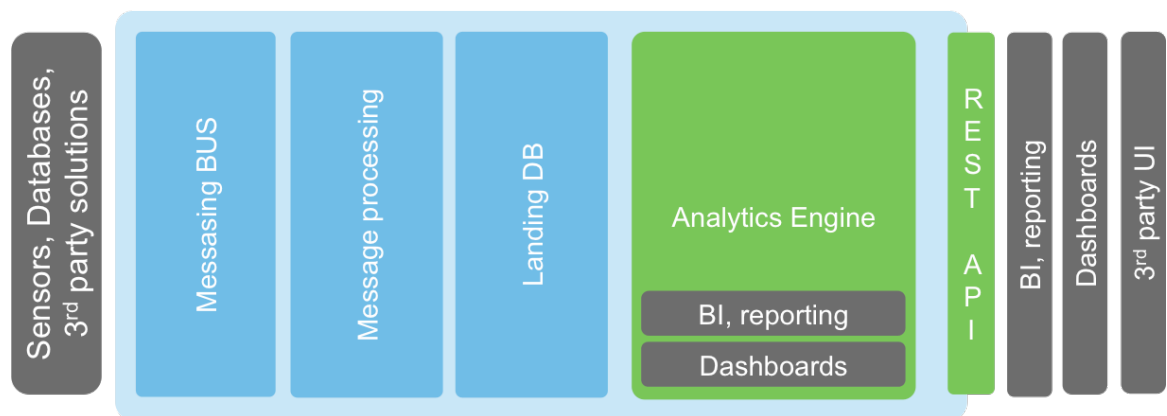


Fig.5 Tieto cloud service platform for advanced analytics

Advanced analytics tools that will work in an environment of heterogeneous and not well structured data sources are needed to build data fusion [21] with further extensions to information and knowledge fusion [22]. The fusion is a key to meaningful summaries and follow-up reports on progress of wellness routines. This will be advanced technology – we should, by the way, get away from the common wisdom that elderly people do not need advanced technology; we have a ~ 100 million consumer market in the EU.

The summaries and follow-up reports should be produced in forms that are adaptive to the users' contexts, to the data collected with various sensor systems, to various types of apps and to the cognitive profiles of the users. This sounds reasonable but requires advanced and innovative designs. With the material from sections 4 and 5 we can offer some answers to Q3: *The design of digital wellness services should be done with the users, not for the users; the ADR offers a reasonable basis for interactive design work with the young elderly; the technology framework should provide data, information and knowledge as support for the adoption of wellness services; the user interface should be an omnivore platform to allow users to compose services that can sustain wellness routines.*

6 Young Elderly User Groups

Young elderly user groups have been organized and worked with us in semi-structured workshops on the design of wellness services; they are using the Wellmo platform and provide feedback on its functionality and usability; some of them use activity bracelets (connected to Wellmo over Bluetooth) and work out how they combine with the Wellmo platform.

In order to get a first overview of the young elderly we asked the association for elderly in Mariehamn (in the Åland Islands that with 28 000 inhabitants is a representative snapshot of the Finnish society)

to invite their young elderly to participate in a survey this fall. A letter was mailed (the association did not have emails registered for its members) to 380 members with an invitation to answer a questionnaire through a link to Webropol; at the moment we have 86 answers that already offer some insight into the group, but the results are preliminary.

The proportion male/female is 46.5/52.3%; 83.1% of the respondents belong to the young elderly, and a further 16.9% are a bit older; 63.5% are married and 16.5% are widowed; 65.5% have a university or technical/commercial degree, 34.5% have a basic education; 78.8% are retired and 16.4% are working full- or part-time; the most typical annual incomes before tax is < 30 k€ (52.9%), 30-40 k€ (18.8%), 40-50 k€ (10.7%) and >50 k€ (17.6%). These profiles are typical for the Åland Islands; we will test for representativeness as soon as we have a more complete sample.

We plan to run the digital wellness services over smart mobile phones; the summary shows that Nokia/Lumia/Microsoft is the most used phone (46.5%), followed by iPhone (23.3%), Samsung (14.0%) and Other (12.8%); we collected data on the actual types of phones in use and found out that a majority (about 73%, but not all) use smart mobile phones; this was confirmed with the result that 72.9% use mobile apps for navigation, weather forecasting, Internet search, etc.

The respondents answered questions about how useful, easy to use and valuable mobile apps are for them following the UTAUT structure of questions (cf. [19]); for the 46 respondents that use mobile apps we found the following profile (cf. fig.6).

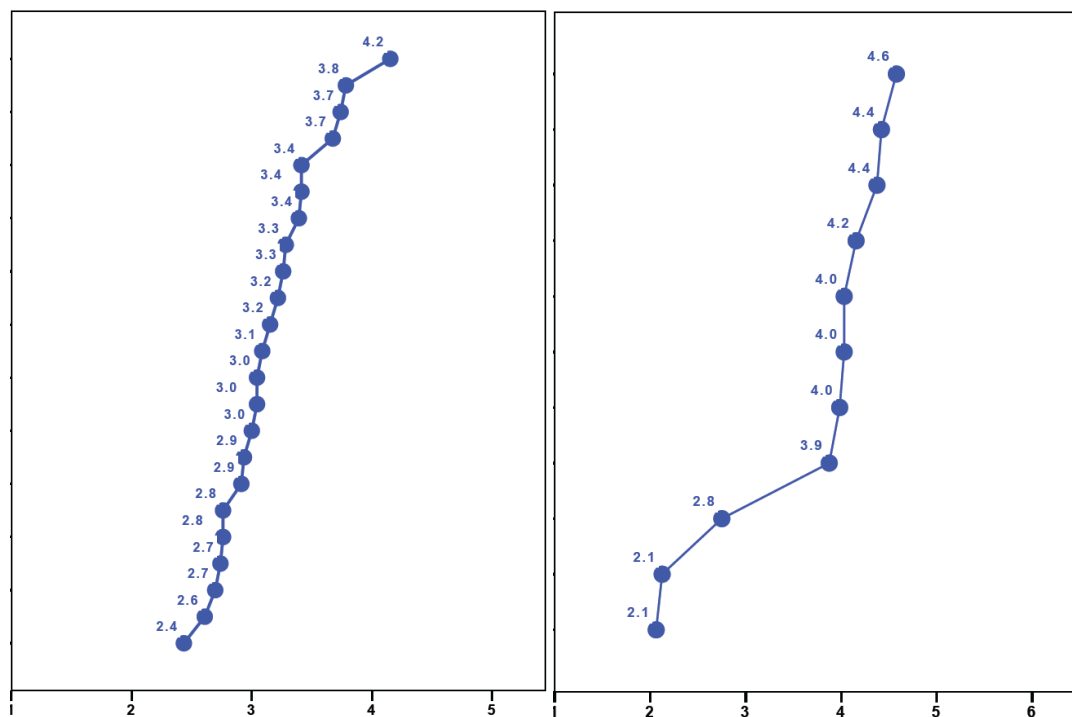


Fig.6 Profiles on adoption of mobile apps (UTAUT) and intellectual wellness characteristics

The adoption of mobile apps scored high on a 5-grade Likert scale on: *mobile apps are useful in my daily life* [4.25.]; *I will continue to use mobile apps* [4.16]; *mobile apps help me to carry out my tasks faster* [3.93]; *using mobile apps helps me to carry out important tasks* [4.00]; *I can use mobile apps without assistance* [3.82]; *I have the necessary knowledge to use mobile apps* [3.71]; *it is easy for me to learn to use mobile apps* [3.69]; *I can use the mobile apps I need with the phone I have* [3.69].

The results need to get a more thorough analysis as soon as the sample is more complete but the indications are: (i) the young elderly use of smart mobile phones is sufficient to launch digital wellness services; (ii) the young elderly are confident users of mobile apps, which is a prerequisite for getting

the wellness services adopted. On the other hand, the proposal *I am addicted to the use of mobile apps* [2.4], shows that the young elderly are critical of how they spend their time with mobile apps.

All the 86 respondents answered questions relating to intellectual and physical wellness on a 6-grade Likert scale and a number of proposals scored high: *intellectual challenges are important for my wellbeing* [4.83]; *I get sufficient intellectual stimulation from my everyday life* [4.53]; *my physical health has been good compared to people around me* [4.42]; *my resistance to illness is good* [4.30]; *the amount of information I have to process in my daily life is suitable for me (not too much, not too little)* [4.29]; *I expect my physical health to remain good* [4.10]; *I expect my physical health to deteriorate with increasing age* [3.94].

An ANOVA was run on a number of combinations of the variables and significant differences were found on (for instance) *intellectual challenges are important for my wellbeing* + *I expect my physical health to remain good* + *the amount of information I have to process in my daily life is suitable for me (not too much, not too little)* when comparing levels of education (cf. fig. 7):

Tests of Between-Subjects Effects

Dependent Variable: SUM wellness1

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|-----------------|-------------------------|----|-------------|----------|------|---------------------|
| Corrected Model | 6.151 ^a | 2 | 3.076 | 3.441 | .037 | .084 |
| Intercept | 1466.040 | 1 | 1466.040 | 1640.116 | .000 | .956 |
| Q4d | 6.151 | 2 | 3.076 | 3.441 | .037 | .084 |
| Error | 67.040 | 75 | .894 | | | |
| Total | 1566.889 | 78 | | | | |
| Corrected Total | 73.191 | 77 | | | | |

a. R Squared = .084 (Adjusted R Squared = .060)

Fig.7 ANOVA on pairings of intellectual wellness variables

The first indications are that the young elderly are well aware of the intellectual wellness dimensions but we need to find out more about the underlying factors when the sample is more complete. Still it appears that there is support for extending wellness beyond the support for physical wellness. It is also not surprising that young elderly think about and evaluate their physical health – the response to the BeWell proposals to develop support tools for improving physical wellness has been enthusiastically supportive.

These results offer us preliminary answers to Q2: *Young elderly rate the wellness issues as important; by combining the wellness proposals with the proficiency of using mobile apps we find support for the plan to build digital wellness services for mobile (omnivore) platforms*. We also have confidence in the following answer to Q1: *A sufficient majority of the young elderly has sufficient confidence in their skills to use mobile technology for it to be a viable proposal to promote digital wellness services as an intervention to build wellness routines*.

7 Summary and Conclusions

The young elderly 60-75 age group was first ignored by the developers of mobile technology and the designers of mobile services as “not interesting”[5] and then by the people worrying about the ageing population as they did not realize the potential to prevent functional impairment among the elderly through intervention among the young elderly. We show how such an intervention could be designed and implemented through digital wellness services over an omnivore platform on smart mobile phones with back-end support from a cloud service platform. A research program – BeWell – is being run with groups of young elderly, supported by a large association for elderly, to find and design proper digital wellness services.

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