"Using Digital Interactive Television to Promote Healthcare and Wellness Inclusive Services"

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Abstract. The potential of digital interactive television (iDTV) to promote original services, formats and contents that can be relevant to support personal health care and wellness of individuals, namely elderly people, has not been fully explored yet in the past. Therefore, in a context of rapid change of the technological resources, in which the distribution and presentation of content comes associated to new platforms (such as digital terrestrial TV and IPTV), it is important to identify the configurations that are being developed for interactive digital TV (iDTV) that may result in relevant outcomes within the field of healthcare and wellness, with the aim of offering complementarity to the existing services and contents made available today via the traditional means and media.

This article describes and discusses the preliminary results of the first part of the research project iDTV-HEALTH: Inclusive services to promote health and wellness via digital interactive television. These first results suggest that iDTV solutions may represent a real contribution to bring healthcare and wellness to the target population, namely as a supplement to health services provision.

Keywords: Healthcare, wellness, digital, television, ICTs.

1   Introduction

The social practice of television is changing in highly contingent ways [1] and this project occurs in the context of a profound transformation of this medium in function of the emergence of new technological platforms, such as digital terrestrial television (DTT) and IPTV, as well as new mobile communication technologies such as WimAX and Long Term Evolution (LTE). Therefore, and in the context of the adoption of new technologies for the production and distribution of TV content, the project intends to evaluate the satisfaction and potential generated by a iDTV service as a way to support personal health care and wellness and facilitate access to the view of information and contents, namely on what concerns its ability to increase levels of social capital amongst target group.

The information and communications technology (ICT) have had an important role in the progress of the health area, intervening in the procedures for the management of

health systems and facilities, closing the gap between these services and the health professionals. Furthermore, the ICT systems open new possibilities of autonomy, allowing, among other aspects, individuals to have access to scientific information about any disease, to monitor their health condition without having to travel repeatedly to a medical office and to safeguard their welfare in an informed manner and in accordance to their individual and social contexts.

According to data from the market studies company Marktest, in 2012, the largest consumers of TV in Portugal are, by age group, the individuals with more than 64 years, who watch TV daily 5h15m08s daily (44.2% more than the average of the population), followed by the group between 55 and 64 years, with 4h15m24s [2]. These figures, together with the fact that peoples' thoughts about health services are highly influenced by media news and information about health [3,4] indicate that TV, more specifically interactive TV (iDTV), can be an excellent platform of health content distribution among the Portuguese seniors, contributing decisively for the development of E-health services.

E-health, the delivery of health information and services via the Internet and related technologies [5], provides new opportunities for interventions aiming health issues, which enable message targeting and tailoring based on users preferences and needs due to the flexible nature of digital media. Using E-health services can also be more appealing to users than traditional information brochures because it is possible to use more audiovisual information [6] and consequently to improve learning due to a continuous interactivity [7].

One of the biggest issues that could limit efficiency of E-health interventions is Health literacy. Health literacy is the ability to read, understand and act correctly with the provided information related to Health. When patients have low levels of health literacy, their ability to perceive and act with the proper medical information available is poor, and they may even put his health at risk [8,9]. Low health literacy can be found and is more common on the elderly, ethnic minorities and those of lower socioeconomic status, which are consequently the most vulnerable groups to health disparities and chronic health conditions [8,9]. In order to a better understanding of the literacy levels of a given population for a more effective intervention, there are already several health literacy measures such as Rapid Estimate of Adult Literacy in Medicine (REALM) [10], Test of Functional Health Literacy in Adults (TOFHLA) and his short version (S-TOFHLA) [11] and Newest Vital Sign (NVS) [12].

It has been shown that E-health interventions designed specifically to meet the needs of low health literate audiences can both be educational and user friendly [13]. Such interventions have been evaluated favorably and considered effective in large surveys with participants of variable degrees of literacy – both low and high health literate users [14,15]. In this sense this project will focus on individuals over 55 years of age with low levels of technological literacy and health professionals.

Therefore, iDTV will fruitfully serve as a contact point between users and health and wellness services professionals, and using these new tools will allow us to extend health care from the typical hospital or clinic to the patient's home, and the diagnosis, treatment and rehabilitation effectiveness will be augmented with the use of a continuous patient record, enhancing their quality of life and keeping their autonomy at

home, while preserving safety [16]. It is the capacity for preparing selected information and blending the concerns of both production and distribution platforms that makes iDTV a valid possibility for aiding health care services in the future.

For this first stage, the proposed research design combines quantitative and qualitative methods, namely:

- Semi-structured interviews with stakeholders, with the involvement of key-people in institutions such as the Portuguese health care system, as well as representative from medical doctors and nurses and, finally, users of the national health service;
- Cross-sectional inquiry to a representative sample of the Portuguese population/target group about health and the new information and communication technologies - internet, mobile phones and iDTV.

2   Overview of the Quantitative Survey

The quantitative survey was applied to 1,207 individuals aged 18 to 93 years (average age 45.63), of which 47.6% were male (n=574) and 52.4% were female (n=633). The data analysis from the quantitative survey indicates that out of the 1.207 participants, 99.6% answered that they have at least one TV set at home. The most common situation found was two TV sets per household, with this option being chosen by 40.3% of participants. Regarding TV consumption habits, 26.4% of the participants said that they watch TV for approximately 120 minutes per day. Then, the participants were asked to indicate, from a given list, which digital services considered more interesting and which they utilized.

Regarding to the most interesting services, TV Guide (63.1%) and High Definition Channels (62.3%) were the services that participants mentioned more. Relevant for this study is the percentage that the Health and Wellness service obtained, being the third most chosen digital TV service with 61.7%. For those over 55 years of age, who represent the target age group of this research project, the most interesting digital TV service was the Health and Wellness service, with 47.2% of the subjects considering this to be a service of their interest. Finally, about which digital TV services are currently more utilized, the TV Guide (34.2%) and the High Definition Channels (34%) were at the top for these respondents. On the other hand, the Audio-Description service is the less chosen with only 1,3% of participants in this survey claiming to use such digital TV service. The Health and Wellness services are mentioned by 4.2% of the respondents. The same happens in the age group above 55 years old.

As shown in previous results, the use of digital TV services is not yet a very common practice for the users. The two main reasons evoked by the participants on why this happens were because they "don't have access" (49.9%) and "because they don't need" (33.2%).

Next, the participants were questioned if they feel any type of difficulties when using digital TV services and 69.6% of the respondents claimed to have no difficulty, 14.1% said that they have little difficulty, 11.8% replied to have some difficulty, 3.1% declared that they have much difficulty, while 1.4% of the respondents stated they can't use it. People who argued to have some kind of difficulty were asked to indicate what

were the main difficulties using a digital TV service were: about half (50.6%) of respondents said that their main difficulty was not knowing what   the functions of the remote TV buttons were. The item "I don't know what the services stood for" was the second option most chosen, by 29.8% of the participants.

The next question focused on the content or functionalities or utilities which may be included in a future health digital TV service. Thus, a list with several functionalities was given and the participants were asked to indicate what they would like to see included in a digital TV health service. The possibility of doing medical appointments was the most selected options by the interviewees (35%). The second most selected option was to contact emergency care (32.5%). To verify the pharmacies timetables was third among the functionalities considered most useful by the participants (28.7%). The functionalities which obtained a lesser degree of interest in this survey were educational games and monitoring patients and treatments, with 1.7% and 3.2% respectively. Analyzing the data focusing only on respondents over 55 years old, the scenario remains broadly the same.

Regarding the question about the most important aspects of a digital TV health service, there were two items that stood out in the participants' selections – total sample and over 55 years old group: "user friendly" and "free of charge" are the essential features that the respondents indicated as most important to incorporate a future digital TV service.

Somehow in order to determine the perception of respondents over the potential that usefulness of a health digital TV service could have for him/herself and his/her family, we asked all the participants to classify the degree of usefulness, from 1 (not useful) to 10 (very useful). The average of all answers is 7.22 and the number 8 is the most often chosen classification with 18.1%. This is another indicator that a service of this kind would be well regarded by the interviewees.

The last question of this questionnaire requested the participants to say how frequently they use the presented sources in a given list to gather information and clarify doubts about health, using a scale between 1 (Never) and 5 (Always). After analysis, the most used sources by the respondents are doctors, nurses, pharmacists, family and friends. Next, below the professional knowledge, and relevant to this study, appears the TV which can be more used than the therapists, patients' associations and books to seek for health information.

A special care to have in the development of this digital platform is the fact that there is a high probability that approximately half of the Portuguese population may have limited health literacy. The Newest Vital Sign – NVS – assessment was used to attempt to gauge the level of health literacy of our respondents.). After the data analysis, it was found that 51.7% of individuals presented a high probability (+50%) of limited health literacy, while 22.6% of the respondents may have limited literacy. Lastly, only 25.7% have an adequate health literacy level.

These data will allow a particular focus in the development of this platform for iDTV in order to adapt it as best as possible to the target population.

3   The Qualitative Study Results: iDTV as a Useful Resource for Healthcare Providers

A set of 13 interviews was collected- 4 by e-mail, and 9 face to face - between September and December 2011. The set of questions posed focused on the possibilities of applications in digital TV in the context of healthcare and wellness.

After using the software NVivo as a tool to support content analysis, it was possible to extract, in relation to the role that respondents consider that ICT should play in the provision of health care and welfare, three fundamental aspects: the answers that highlight information; those who privilege the role of communication and those who consider that they can have a relevant role in what concerns mobility and accessibility.

In what concerns the informative role, it was indicated that ICTs in health can have a relevant saying in minimizing the consequences of low health literacy, increasing the level of health information and in particular about chronic diseases, and in making health information more understandable to the common health services user. It is also relevant to add that in what concerns the insurance activity, ICTs are stated to make easier the access to information of the clients' portfolio of each healthcare provider easier, as well as the choice the user makes of these providers.

As for the communication role, it was mentioned that the essential ICTs role in healthcare should be: to make communication easier between healthcare professionals (which would include the discussion of diagnosis, the exchange of clinical opinions among medical staff, etc.); to make communication easier between healthcare professionals and the users of healthcare services, through monitoring, remote doctor's appointments, etc.

Finally, in what concerns the role of ICTs as enablers of the conditions of accessibility and mobility, the following aspects are to be highlighted: ubiquity of the physical support; physical demobilization (meaning that it may allow for remote appointments, previous sorting out of emergency cases, to remotely sort symptoms, etc.); National healthcare services to become less congested.

Still, as for potentially negative aspects of ICTs as resources for the access to healthcare, several aspects were mentioned: low levels of technological literacy that don't allow their extended use; too much of an out-of-context and general information that ends up being of no practical use; the costs such resources would involve and the difficulties in maintaining an effective structure.

4   Discussion and Next Steps

As we can see and according to the data previously mentioned from Marktest, a large majority of people spend more than two daily hours watching TV. This element combined with the fact that TV is for the interviewees, right after to healthcare professionals, the most trusted source to gather information about health, appears as a further incentive for the awareness of the potential of digital interactive TV to promote services, formats and original content that may be relevant to the area of Health and Wellness.

The data analysis from the quantitative survey also specifies that a digital service to promote health and wellness is indicated as a helpful service and regarded as the most

interesting by the target population. This indicates that the target population is concerned about their health and welcomes anything that will help them stay healthy. Yet, it is vital that this application (app) can be free of charge for the users to secure his success, because this condition is the second most important aspect of a digital TV health service for interviewees.

On the other hand, we can verify that using digital TV services is not yet a common task with all provided digital services obtaining low percentages when the individuals were asked by their usage rate of digital TV applications. About half (49.9%) of the respondents say that they don't use TV digital services because they don't have access to them in their home. Thus, for a health app to be as much as possible accessible to everyone, one first step to be taken is to reach an agreement with TV service providers in order to cover the population. Second step is to present the app to the healthcare professionals, so that they talk to their patients about the included features and help them to search for the easiest way to get the app.

Moreover, in relation to the level of health literacy, the data shows that 51.75% of individuals have a high probability of limited literacy. Therefore, on the development of a future health and wellness digital service it is essential that these factors are taken into account to easily develop an app designed specifically for the low literate groups, helping them to have a positive usage of it. Doing this will allow the users to see the real benefits of using such app at the same time that they are being encouraged to learning new forms of protecting their health.

And what do the users expect to find in a health app or service via digital TV platform? Analyzing the most chosen utilities by the respondents when enquired what they would like to see included in a future health app, we can see that their favorites are the utilities that could help them to do several tasks at home that normally force them to go out to resolve them, like the possibility of doing medical appointments, consulting pharmacies schedules or messaging with healthcare professionals. This is a positive aspect because it will allow, as Stankovic stated, an enhanced autonomy to people by letting them take care of their health issues easily, being the possibility of doing this without leaving their home, the most positive feature.

The stakeholders put emphasis on three key aspects of the role that ICTs should play in health care and welfare: inform, simplify communication between health professionals and users and facilitate the accessibility and mobility conditions. These key characteristics match with the population's requests that we saw in the quantitative survey. But they also pointed several potentially negative aspects like the lower level of technological literacy, the decontextualized and generalized information and the costs and difficulties inherent to maintaining an efficient structure. To minimize these aspects, a possible health app must be user friendly, both software and hardware (the unknown functions of the TV remote control were the main reason named by respondents for the existence of difficulties when using a digital app), all the available in-app content and information should be supervised by health professionals to guarantee its quality and the right entities partnerships must be wisely chosen to make a future health app project financially viable, at the same time that assures its credibility.

Consequently the results show that iDTV solutions could represent a real contribution to deliver healthcare to the target population, namely as a supplement to health services provision in order to avoid unnecessary visits to the health centers or hospitals.

Currently, our research team is focusing on the development of an iDTV portal solution for Smart TV, mobile and PC, where the users will have the possibility to obtain credible and rigorous information about diabetes (mostly in video format), to access useful tips and contacts about the disease and to monitor basic indicators related to Diabetes.

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