

The potential of digital interactive television for the provision of healthcare and wellness 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 yet fully explored in the past. Therefore, in a context of rapid change of the technological resources, in which the distribution and presentation of content comes associated with new platforms (such as digital terrestrial TV and IPTV), it is important to perceive 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 delivery healthcare and wellness to the target population, namely as a supplement to health services provision.

Key-Words: Healthcare, wellness, digital television, digital solutions, ICTs.

Introduction

This article presents the preliminary results of the research project “iDTV-HEALTH: Inclusive services to promote health and wellness via digital interactive television”, whose main objective is to evaluate 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 over 55 years of age in the Portuguese territory.

The social practice of television is changing in highly contingent ways (Green, 2008) 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 new technologies adoption for the production and distribution of television 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 information visualization and contents, namely on what concerns its ability to increase levels of social capital amongst target group.

It has been shown that e-health – the delivery of health information and services via the Internet and related technologies (Eysenbach, 2001) – interventions designed specifically to meet the needs of low health literate audiences can be both educational and user friendly (Whitten, Love, Buis & Mackert, 2008). Such interventions have been evaluated favorably in large surveys with participants of varying degrees of literacy (Mackert, Whitten & Garcia, 2008) So this project will focus on individuals over 55 years of age with low levels of technological literacy and health professionals.

The project involves four central activities:

- 1) Evaluation of attitudes and perceptions towards the usage of iDTV as a communication and content delivery platform in the realm of personal health care and wellness;
- 2) Development of a iDTV portal solution: portal with video content, as well as still images and text, with associated navigation system both for IPTV and mobile;
- 3) Development of a visualization solution “iDTV library”, for archiving and visualization of medical/ health related information;

4) Pilot environments for testing and evaluation of the prototypes, namely in terms of social capital, usability and receptivity amongst target groups.

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;
- Pilot iDTV library with sample of professional health care providers: medical doctors and physiotherapists;
- Usability study of iDTV portal for IPTV and iDTV portal for Mobile TV with sample of target-users;
- Qualitative exploratory research for evaluation of iDTV portal for IPTV and iDTV portal for Mobile TV amongst target groups in order to evaluate their impact on what concerns social capital generation and users' satisfaction.

In this paper, we present and discuss the preliminary results of the first part of the research project iDTV-HEALTH: Inclusive services to promote health and wellness via digital interactive television, namely, the cross-sectional inquiry and semi-structured interviews with stakeholders in the health field in Portugal. The iDTV Health Project aims to effectively contribute to a better understand of the processes associated with the transformation of the social practices of television use, namely on what concerns the offer of tailored services and contents to specific groups and the consequences of such process in terms of social capital and users' satisfaction. Complementarily, the project also proposes a strong component of content production and the development of friendly solutions targeted at users with low literacy levels. We believe that the developed ideas and outcome solutions we might provide can be of greater utility and also the standard for future projects, not only in Portugal context but also for other European countries in which new efforts are being made in order to understand the potential of this type of technologies to promote health-related information.

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). Concerning the age distribution, 11.8% had 18 to 42 years, 20.7% had 25 to 34 years, 19.1% had between 35 and 44 years, 18.1% were in the age group 45-54 years, 13.9% had 55-64 years and, finally, 16.3% had 65 years old or more. Lastly, regarding the nationality, 93.9% of the survey participants are Portuguese and the remaining respondents are from Brazil, Cape Verde and others.

The participants were selected by a quota method, based on a matrix which crossed variables such as gender, age, education level, occupation, region and place of residence. Overall, the instrument was composed of a total of 26 questions, 13 characterization items and Newest Vital Sign measure. The survey was applied by a market studies company GfK during September 2011, at the participants' households by a total of 68 interviewers through a direct and personal interview. The data was analyzed with IBM SPSS Statistics 19 software.

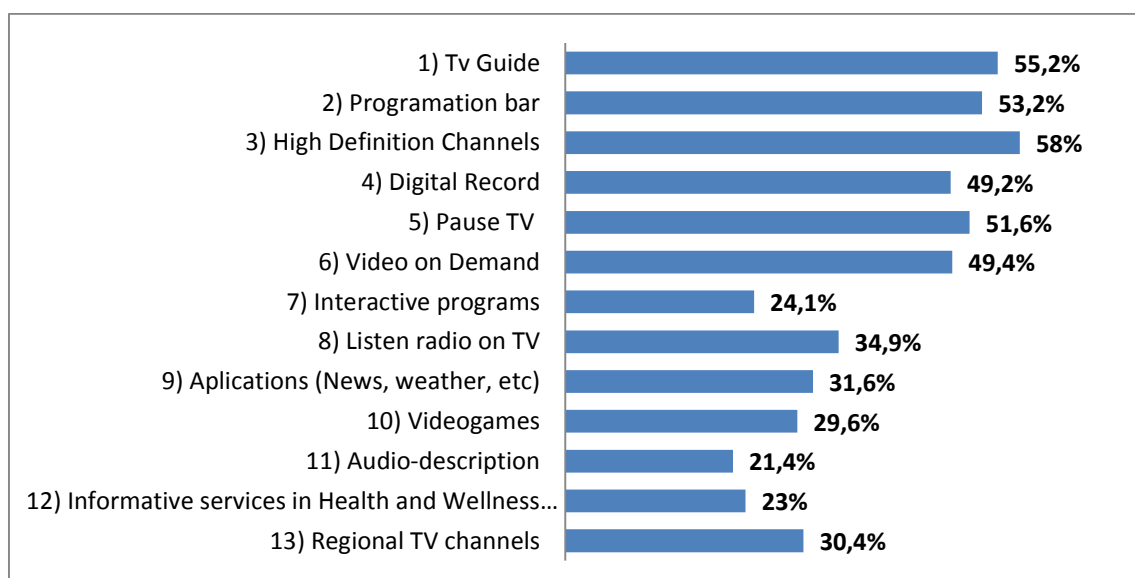
The data analysis from the quantitative survey indicates that out of the 1,207 participants, 99.6% answered that they have at least one TV set at home. The most common situation found was two TV sets per household, with this option being chosen by 40.3% of participants. Regarding television consumption habits, 26.4% of the participants said that they watch television for approximately 120 minutes per day (table 1).

Table 1 - Approximately how long pass watching television per day?

	%	n = 1202
Up to 59 minutes	4%	48
60 minutes	12,7%	153
90 minutes	5,9%	71
120 minutes	26,4%	317
150 minutes	4,3%	52
180 minutes	16,6%	199
From 210 minutes to 300 minutes	19%	228
More than 300 minutes	7,2%	86
Don't watch TV	,7%	9
Dont't know/ Don't reply	3,2%	39

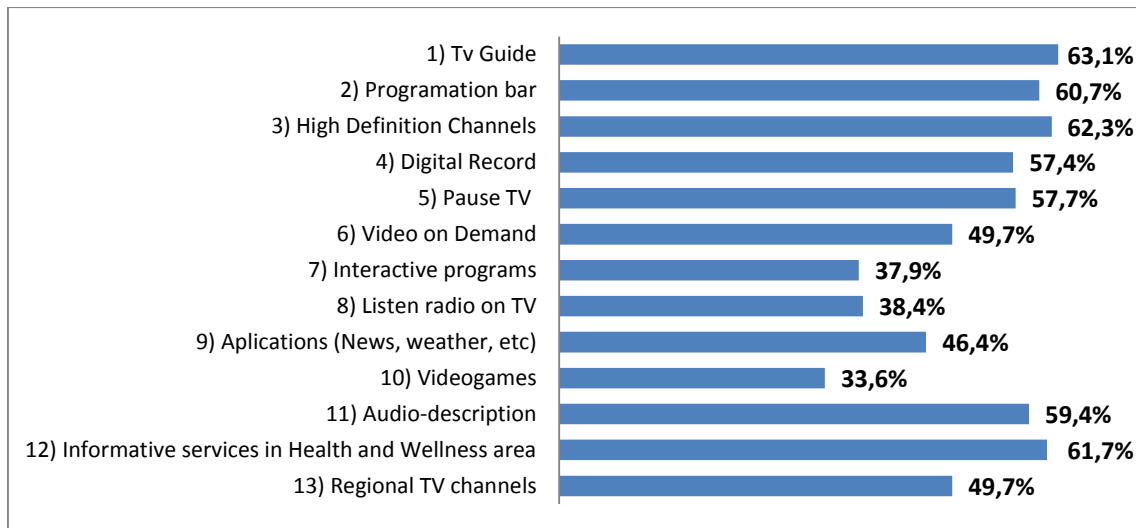
Then, the participants were asked to indicate, from a given list, which digital services they knew, which they considered more interesting and which they utilized. Relatively to the most popular services, the ones which scored higher were High Definition Channels, TV Guide and Programming Bar with 58%, 55.2% and 53.2% respectively. The Audio-Description service is the less known of these digital TV services. The knowledge about Health and Wellness digital TV services was reported by 23% of the respondents, being the second less known (graphic 1).

Graphic 1 - Could you tell me which of the following digital television services you know?

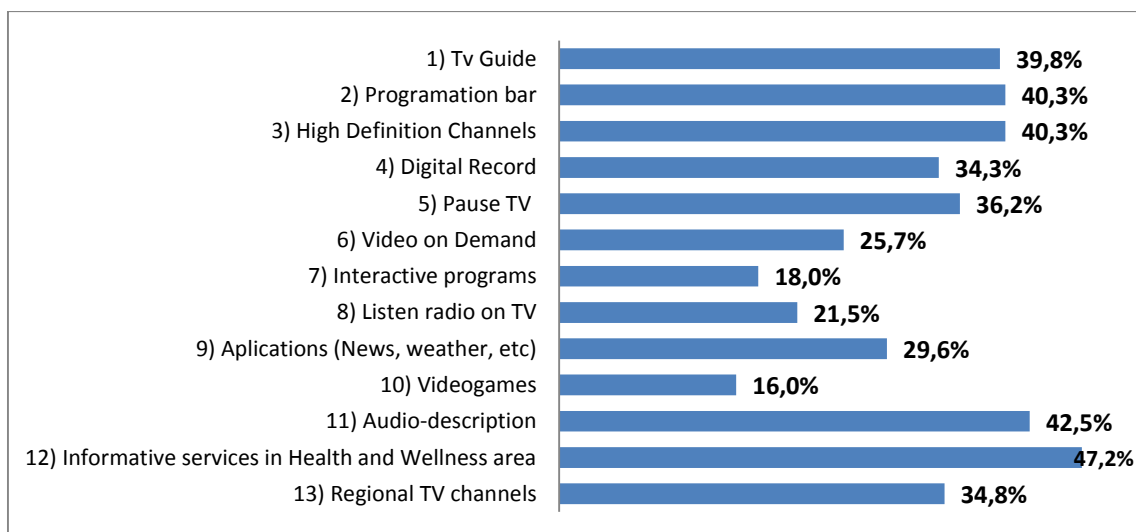


Regarding to the most interesting services, TV Guide (63.1%) and High Definition Channels (62.3%) were the services more mentioned by the participants. Relevant for this study is the percentage that the Health and Wellness service obtained, being the third most chosen digital TV service with 61.7%. The service less interesting for the survey participants was the Audio-Description service with 21.4% of the respondents considering this service as interesting for them (graphic 2). 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 (graphic 3).

Graphic 2 - And which of these digital television services you find interesting? (total sample)

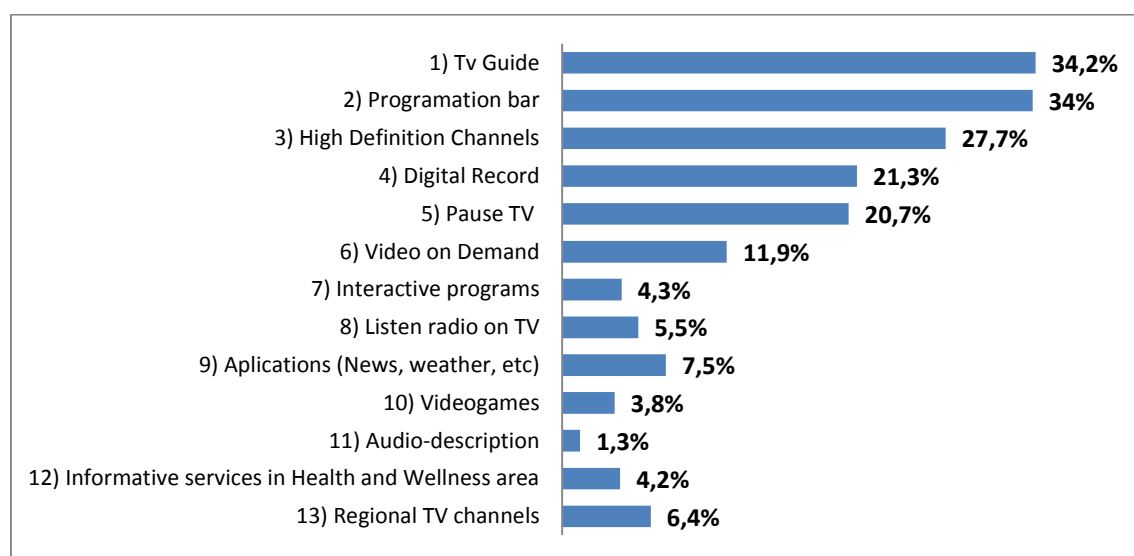


Graphic 3 - And which of these digital television services you find interesting? (+ 55 years old)

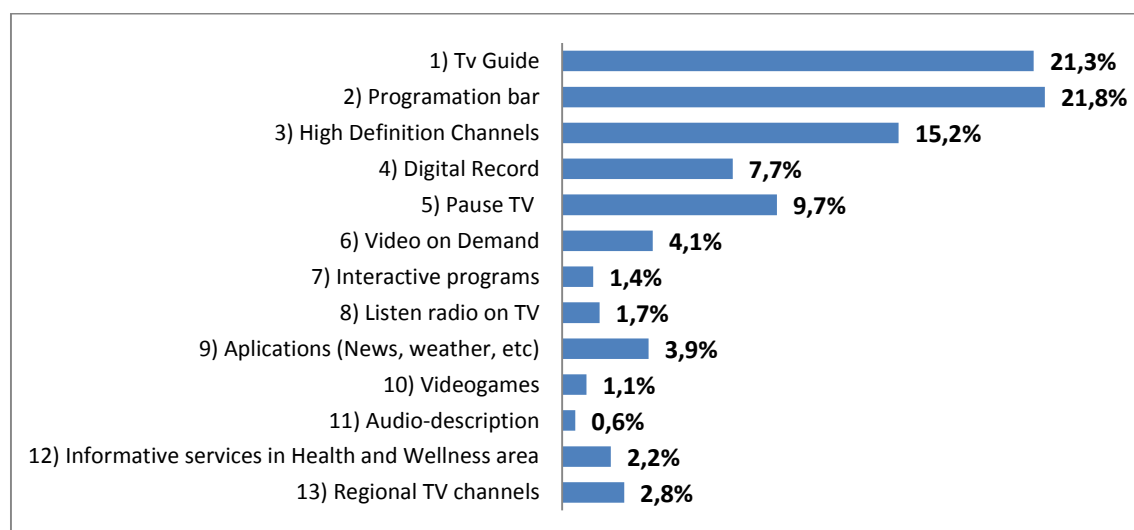


Finally, about which digital TV services are currently more utilized, the TV Guide (34.2%) and the High Definition Channels (34%) were at the top for these respondents. On the other hand, the Audio-Description service is the less chosen with only 1,3% of participants in this survey claiming to use such digital TV service. The Health and Wellness services are mentioned by 4.2% of respondents (graphic 4). The same happens in the age group above 55 years old (graphic 5). Important to notice the low percentages in all digital services concerning to their use.

Graphic 4 - And which do you use? (total sample)



Graphic 5 - And which do you use? (+ 55 years old)

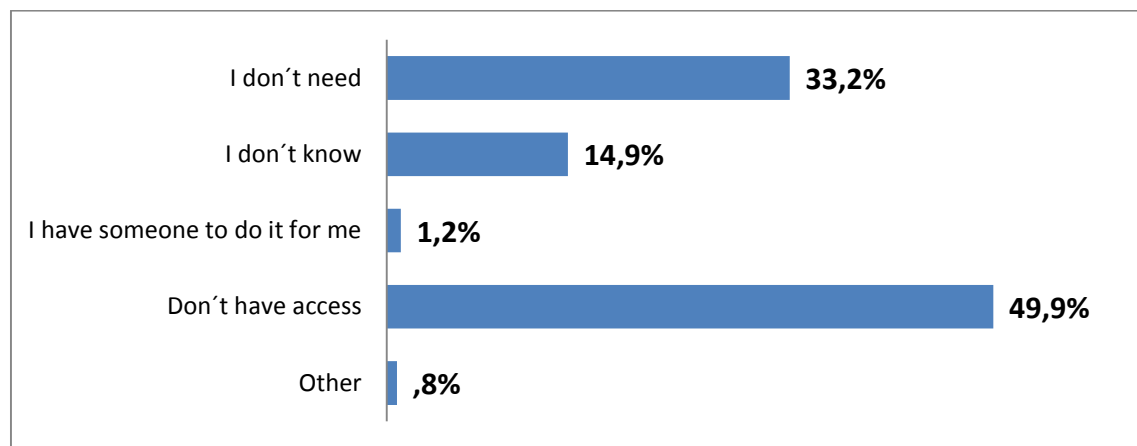


After analyzing these data, it appears that a new digital service in the area of Health and Wellness may be an asset for future users, since the actual services are not known and not used by majority of the people. When asked about the most interesting

digital TV services, a service in Health area is the third most frequently mentioned in total sample data and is the most interesting service for the interviewees over 55 years old.

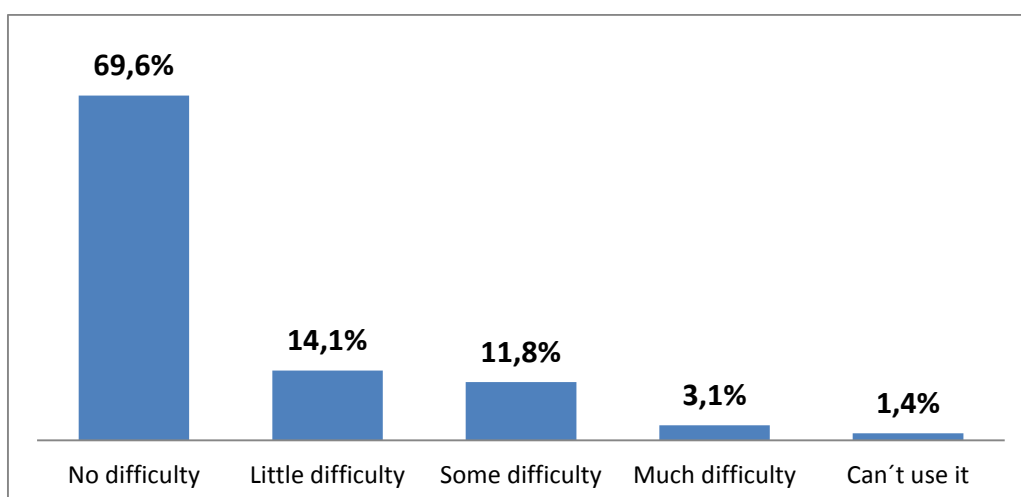
As shown in previous results, the use of digital TV services is not yet a very common practice and for the users. The two main reasons evoked by the participants on why this happens were because they “don’t have access” (49.9%) and “because they don’t need” (33.2%) (graphic 6).

Graphic 6 – Why you don’t use the digital television services?

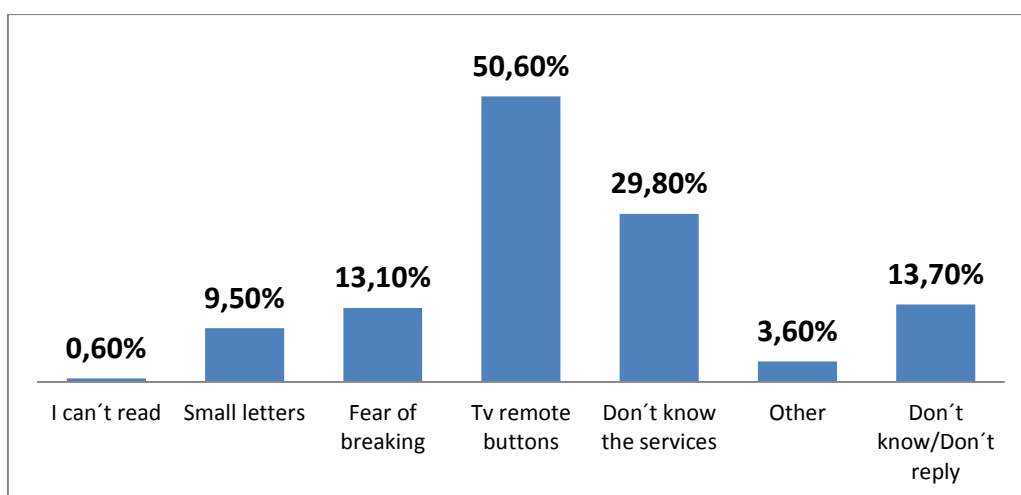


Next, the participants were questioned if they feel any type of difficulties when using digital TV services and 69.6% of the respondents claimed to have no difficulty, 14.1% said that they have little difficulty, 11.8% replied to have some difficulty, 3.1% declared that they have much difficulty, while 1.4% of the respondents stated they can't use it (graphic 7). People who argued to have some kind of difficulty were asked to indicate what were the main difficulties using a digital TV service: about half (50.6%) of respondents said that their main difficulty was not knowing what were the functions of the remote TV buttons. The item “I don't know what the services stood for” was the second option most chosen, by 29.8% of the participants in this survey (graphic 8).

Graphic 7 - When you use digital TV services, you feel some difficulty? (n = 553)



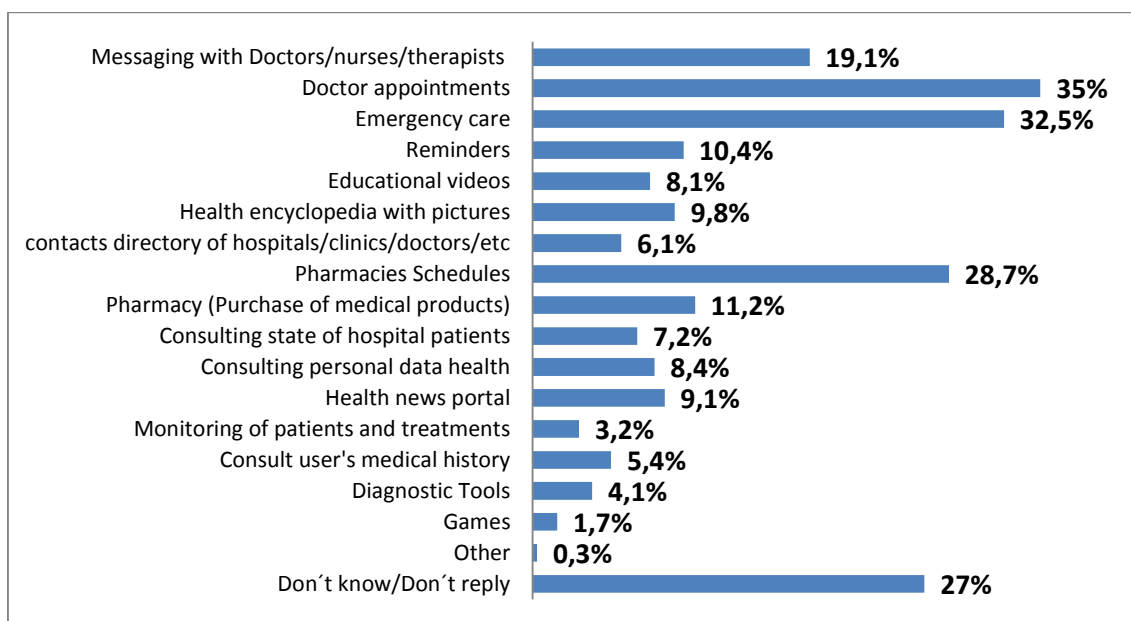
Graphic 8 - What are your main difficulties when using a digital TV service? (n = 168)



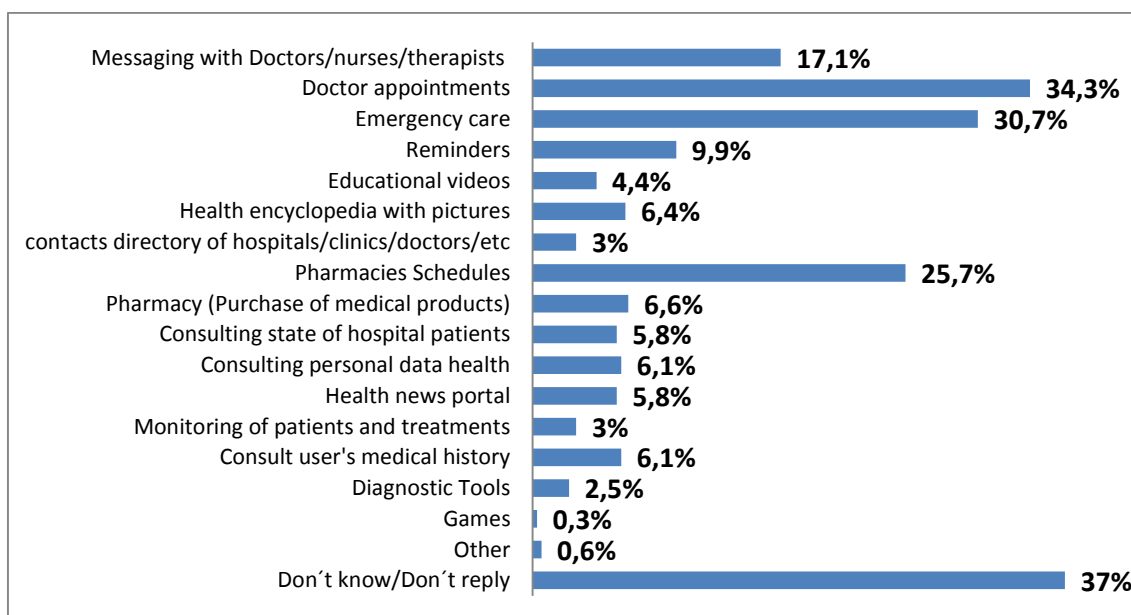
The next question focused on the content or functionalities or utilities which may be included in a future Health and Wellness digital TV service. Thus, it was given a list with several functionalities and the participants were asked to indicate what they would like to see included in a digital TV health service. The possibility of doing medical appointments was the most selected options by the interviewees (35%). The seconds most selected option, from the ones listed, was to contact emergency care (32.5%). To verify the pharmacies schedules was third among the functionalities considered most useful by the participants in this survey (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 (graphic 9). Analyzing the data focusing only the on respondents over 55 years old the scenario remains broadly the same (graphic 10).

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 (graphic 11) and over 55 years old group (graphic 12): “user friendly” and “free of charge” are the essential features that the respondents indicated as most important to incorporate a future digital TV service.

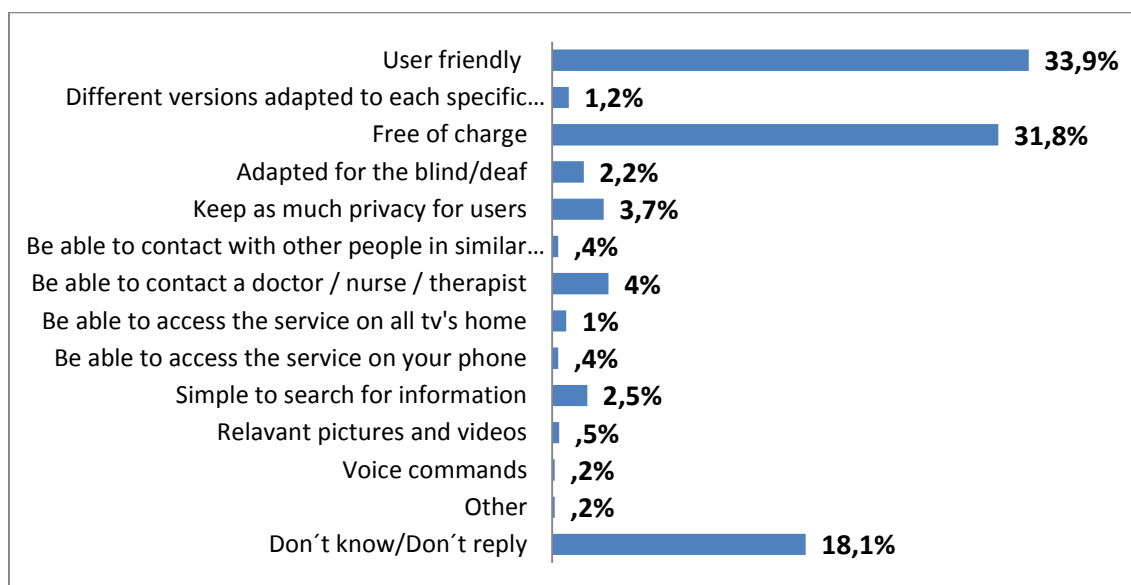
Graphic 9 - What information and utilities would like to see included in a health and wellness digital TV service? (total sample)



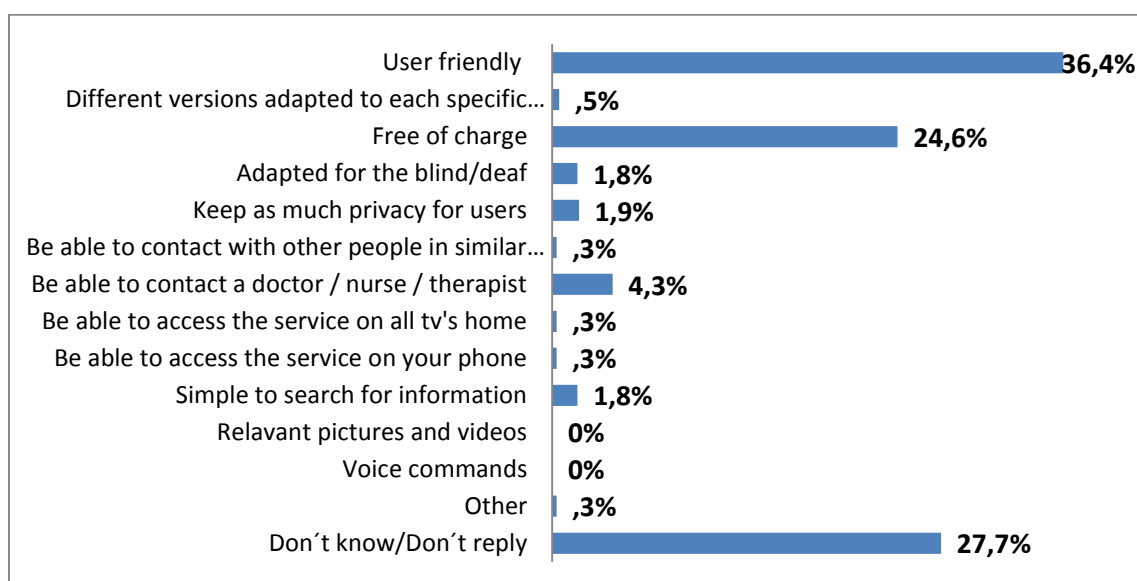
Graphic 10 - What information and utilities would like to see included in a health and wellness digital TV service? (+ 55 years old)



Graphic 11 - Of the following aspects what is for you the most important to be present in a health and wellness digital TV service? (total sample)

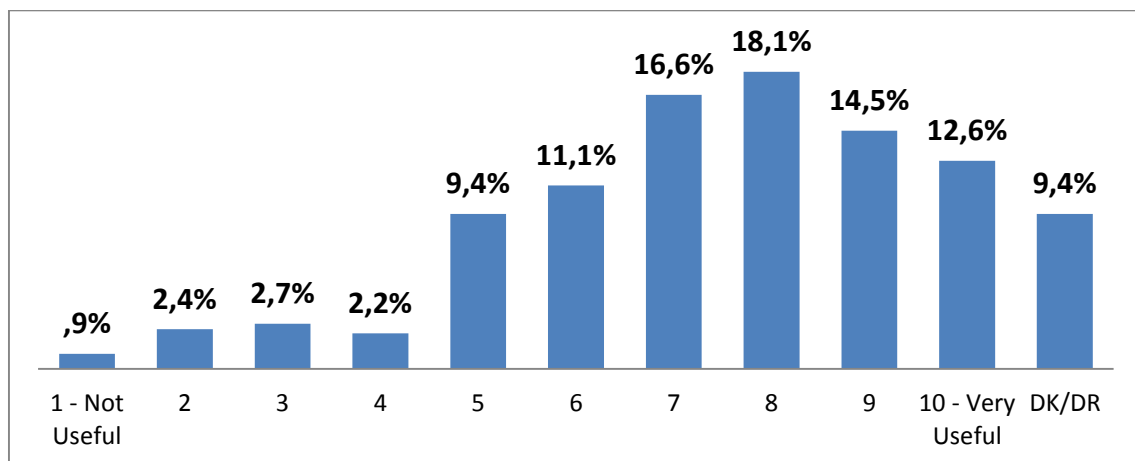


Graphic 12 - Of the following aspects what is for you the most important to be present in a health and wellness digital TV service? (+ 55 years old)



In order to, somehow, determine the perception of respondents of the potential usefulness of a Health and Wellness 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% (graphic 13). This is another indication that a service of this kind would be well regarded by the interviewees.

Graphic 13 - For you and your family what would be the degree of usefulness from 1 (nothing useful) to 10 (very useful) of a health and wellness digital TV service?



Average: 7.22

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 television which can be more used than the therapists, patients' associations and books to seek for health information (table 2). This appears as a further incentive for the awareness of the potential of digital interactive television to promote services, formats and original content that may be relevant to the area of Health and Wellness.

A special care to have in 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. Health literacy is the ability to read, understand and act correctly with the provided information related to Health. When patients have little ability to perceive and act with the proper medical information available, they may even put his health at risk (Ad Hoc Committee on Health Literacy, 1999; Nielsen-Bohlman, Panzer, & Kindig, 2004). The Newest Vital Sign – NVS – assessment was used to attempt to gauge the level of health literacy of our respondents. So the NVS is a tool constructed for a quick and simple way to assess the health literacy level. It can be administered in only three minutes and consists in the presentation to the patient of an ice cream nutrient information label followed by a series of questions about the information on the label. Finally, based on the number of correct questions is possible to have a rough idea of the health literacy level of the subject (Weiss, B et al, 2005). As

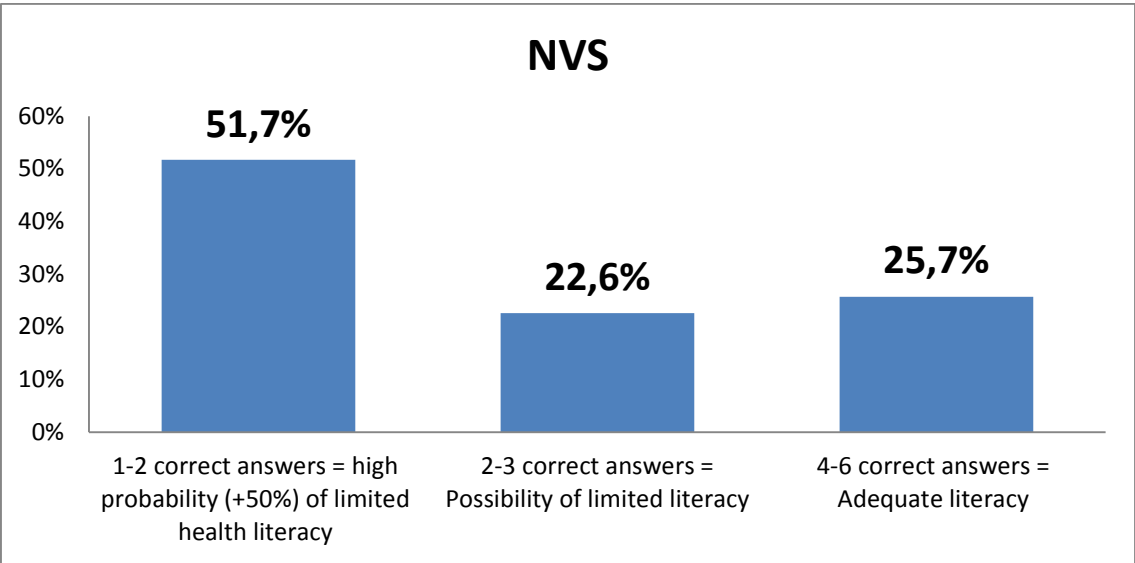
previously stated, 51.7% of individuals presented a high probability (+50%) of limited health literacy, while 22.6% of the respondents may have limited literacy. Lastly, only 25.7% have an adequate health literacy level (graphic 14).

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

Table 2 - Using a scale ranging from 1 to 5 where 1 means "never" and 5 means "Always", tell me please, how often you use the following sources to gather information and clarify doubts about health?

	Never	Few times	Sometimes	Often	Always	DK/DR
a) Family and Friends	8,9%	27,1%	34,2%	20%	9,2%	0,7%
b) Doctors	1,9%	12,1%	29%	27,5%	29%	0,6%
c) Nurses	16,1%	22,1%	30,4%	17,9%	12,9%	0,6%
d) Pharmacists	7,6%	19,6%	33,7%	25,5%	13%	0,7%
f) Therapists	65,1%	14,6%	11,1%	5,4%	2,3%	1,3%
g) Patients' associations	83,2%	8,7%	4,4%	1,8%	0,8%	1%
h) Newspaper/magazines	60,7%	20,5%	14,6%	3%	0,4%	0,8%
i) Books	64,8%	17,7%	13,8%	2,4%	0,4%	0,8%
j) WEB Sites	74,4%	10,3%	10,2%	3,6%	0,6%	0,9%
l) Social Networks	85%	6,7%	5,2%	2%	0,2%	0,9%
m) Television	51,7%	21,8%	18,5%	6,1%	1,1%	0,8%
n) Radio	72,4%	16,6%	7,8%	1,8%	0,5%	0,9%
o) Online Social Networks (Facebook, Tweeter)	84,9%	6,7%	5,4%	1,2%	0,6%	1,2%

Graphic 14 – Newest Vital Sign



The qualitative study results: iDTV as a useful resource for healthcare providers

In parallel and in addition to the quantitative study, a diverse set of stakeholders was interviewed, including representatives of healthcare units, health professionals, health institutions, several associations related to health issues, insurance companies with health insurances and others. The set of questions posed focused on the possibilities of applications in digital television in the context of healthcare and wellness, namely:

- What role would you consider that ICTs can and should play within the context of healthcare provision and wellness?
- Would you consider that in this context these ICTs should essentially: inform, support diagnosis, support follow-up activities, or another kind? What potential would you recognize in these technological resources?
- What breaches would you point in the functioning of the ICTs currently available in healthcare and wellness access, that could be minimized with the use of iDTV?
- What kind of iDTV applications would you consider useful as a complement to the providing of healthcare and wellness?
- (to healthcare professionals only) Do you feel that the communication with the patients is fluid? Do you feel that he/she understands you when you explain treatments, health conditions, etc.?
- Would you say that the current television fictional series and debates about health can have an effective informative role among the population, and in which way?
- Would you like to include further aspect of suggestion related to this theme?

From the information obtained, in relation to the role that the interviewed stakeholders consider ICTs should play in the context of the providing of healthcare and wellness, there are 3 essential aspects to retain: 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 chronicle 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 to the clients' portfolio of each healthcare provider, 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 (as well as informal caregivers – namely relatives of patients, for instances), through monitoring, remote doctor's appointments, explanation of treatments, 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.

In what concerns the possible applications of ICTs in the access and providing of healthcare, the aspects the answers revolved around were the following: information and prevention (information about health issues in general, chronicle diseases and prevention); Remote support to healthcare professionals (sharing of information for diagnosis purposes, consultations between healthcare professionals, interaction between healthcare professionals of distant healthcare units – within Portugal or not); Remote support to patients (remote diagnosis activities, remote observation of symptoms and complaints, etc.; remote follow-up of medical treatments; remote post-interventional

follow-up). Of this last aspect the following consequence is pointed out: to avoid unnecessary iterations through a more effective system of sorting out real emergencies would lead to a less congested national healthcare system.

When questioned about the flaws the interviewed stakeholders saw in the ICTs' current performance as resources applied to healthcare that could eventually be minimized by iDTV, the aspects on which the answers revolved were the following:

- **Personalized information:** to allow the transmission of information and personalized data, in context with the patients' clinical history, which would make communication more effective; more precise and concise information; a better framing of the information related to the process of forwarding and treatment of the patients, as well as in the very following-up of post-op treatments;
- **Appealing technical possibilities:** as a way of better organizing information and communication; it allows the national healthcare services to work better;
- **Costs:** the generalized use of iDTV could represent a lower maintenance cost than the one concerning other ICTs;
- **Accessibility:** current ICTs are probably of less simple access as iDTV can be, being this technology simpler and inserted in a technological environment that is more familiar to people with less technological literacy;

To the stakeholders involved in the medical practice and the interaction with patients, it was asked what perspective did they have about the level of health literacy the patients had, as well as how they felt the healthcare professionals were prepared to communicate with people with a low health literacy level. Of the set of answers that pointed out the difficulties of **communication between medical staff and patients**, two essential aspects were highlighted: the patients feel difficulties in understanding the explanations of the professional healthcare professionals (due to factors such as low literacy level; use of technical slang; the patient's being upset); the healthcare professionals have difficulties in making themselves understood to the patient (due to lack of time and lack of preparation).

Still in this field, an aspect that was pointed out by some of the interviewed was that of the specificity of the communication between the healthcare provider and the patient, as being naturally emotive and irreplaceable in relation to the potentiality of the ICTs;

on the other hand, it was also highlighted the potential the ICTs show as resources to complement this communication, in making it easier and more fluid and not replace it.

Another question asked had to do with the perception the interviewed stakeholders had in relation to the **television fictional series and debate shows** concerning health issues, and whether they could have an effective informational role among the population and if so, in what way.

Therefore, it was obtained a set of favorable positions to the idea that TV programming does have an effective informational role (5 stakeholders), and a set of unfavorable positions to this idea (4 stakeholders), as well as a neutral answer. From the favorable positions the following aspects are to be pointed out: TV shows can demonstrate simple actions, such as the care to have with little children; they can launch debate on healthcare issues, making people curious and willing to know more about it or changing lifestyle habits; they can reach effectively to a wider slice of the population with low health literacy levels; they can allow more information for the population in general in health issues.

As for the unfavorable set of positions, the aspects to single out are the following: there is a risk that the excessive amount of information becomes uninformative; sensationalism being favored to useful information; it is necessary that fictional contents and effective informational contents complement each other.

Another question asked was related to exactly what **iDTV applications** would the stakeholders consider useful for the providing of healthcare and wellness. The answers obtained could be arranged in four types:

- **Visual support:** applications with interactive images to help the communication between a healthcare professional and a patient, complementing their explanations with an illustration; applications to share images and several exams between doctors – minimizing therefore errors of diagnose;
- **Information:** about ‘civilizational’ diseases, improving of life habits, prevention, personalized information, made available in the patients’ houses and the healthcare units where they can consult it; useful in the teaching of health related matters;
- **Scheduling and reminding:** to allow for the remote scheduling of medical appointments; reminders of pills and treatments; etc.;

- **Remote consultations:** sharing of information and data between patients and medical staff; telemedicine; remote medical appointments (that can allow a better sorting out of real emergency situations and minimize unnecessary itinerations as well as make easier the contact with geographically isolated patients); remote following-up of patients, with eventual possibility of sending exams and biometrical data through iDTV;

Of the set of interviews that took place it was possible to collect a set of perceptions in relation to the potential of iDTV in what concerns the providing and access of healthcare and wellness. Therefore, the perceptions that positively value this potential revolve around the following aspects:

- **Information:** iDTV consists of a medium with strong potential to inform and promote health issues, in a more general way as well as in a more preventive way; it can minimize low literacy barriers;
- **Communication:** between healthcare professionals, avoiding diagnosis errors; between medical staff, informal caregivers and patients. Personalized information is the big advantage of iDTV;
- **Remote following-up:** of treatments and diseases, avoiding unnecessary medical appointments and itinerations;
- **Practical applicability:** more relevant than for other ICTs; easier use, being also simpler for the users.

As for the answers that value negatively the resource to iDTV in this context, they point out the following aspects:

- **Difficulty in generalized access:** the reason appointed for this being an eventual high cost;
- **Privacy:** the interaction between medical staff and patient could leave the environment of the doctor's office;
- **Monetary compensation:** that would compensate the investment in iDTV;
- **Loss of the emotional component in the relation between doctor and patient:** in the case of eventual remote appointment.

Finally, it is important to add some safeguards that were pointed out in what concerns the resource to iDTV in the context of the providing and access to healthcare, namely:

- **Deontological questions:** what are the limits to the responsibilities of medical staff, technical staff and patients;
- **Commercial model:** at what point would it favor health to commercial aspects?;
- **Induction of false needs:** if the information is too general and doesn't contemplate the specificity of the individual;
- **Integration with the National Healthcare System:** priority to cooperation with private healthcare providers, as a way of extracting its full potential;
- **Social isolation:** the use of iDTV must not increase it; human contact is essential.

Discussion and next steps

Throughout this paper we sought to realize the potential of digital interactive television (iDTV) to promote original services and contents that can be relevant to support personal health care and wellness of individuals, namely elderly groups.

With a research design that combines both quantitative and qualitative methods of analysis we tried to gather the necessary data to allow us to evaluate the attitudes and perceptions towards the usage of iDTV as a communication and content delivery platform in the realm of personal health care and wellness.

This data will help us achieving the main objective of this project that is the development of an iDTV portal solution with video, images and text content with associated navigation system both for IPTV and mobile.

The data analysis from the quantitative survey 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 fact shows that the target population is concerned about their health and welcomes anything that will help them stay healthy but is vital that this application 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 by these results that using digital television 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 television applications. Also concerning the level of health literacy, the data shows that 51.75% of individuals have a high probability of limited literacy. Thus, on the development of a future Health and Wellness digital service will be essential that these factors are taken into account. So the Health application must be as much as possible accessible to everyone (49.9% of people don't use TV digital services because they don't have access in their home) and with user friendly software and hardware like a more simple TV remote and always accessible help information on screen about every step that is possible to do next in the application.

Analyzing the most chosen utilities by the respondents that they would like to see included in a future health application, we can see that their favorites are the utilities that could help them to do several tasks at home that normally obligate to go out to resolve them like the possibility of doing medical appointments, consulting pharmacies schedules or messaging with healthcare professionals. This is another important detail to remind in the application development.

The interviewed 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 and it is very helpful to the development team that these two sides are in tune. On the other hand, they pointed several potentially negative aspects like the lower level of technological literacy, the decontextualized and generalized information and the costs and difficulties inherent in maintaining an efficient structure.

Consequently the results from both quantitative and qualitative surveys shows that iDTV solutions represent a real contribution to delivery healthcare and wellness to the target population, namely as a supplement to health services provision and that further research is needed on the actual framing of such offer.

Currently our research team is focusing on the development of the content that will be integrated on our iDTV portal solution. This content will be based on the disease of Diabetes that will be the main subject of the pilot. We expect to have in our solution both informative video and text content as well images that will help people to understand better Diabetes. Concluding is our goal that this platform can be accessible from digital TV as well from mobile devices with a proper application.

Bibliography

Ad Hoc Committee on Health Literacy. (1999). Health Literacy: Report of the Council on Scientific Affairs. *Journal of the American Medical Association*, **281**, 552-557

Eysenbach, G. (2001). What is e-health? *Journal of Medical Internet Research*, **3(2)**, e20

Green, J. (2008). Why do they call it TV when it's not on the box? "New" television services and "old" television. *Media International Australia*, **126**: 95-106

Mackert, M. Whitten, P. & Garcia, A. (2008). Evaluating e-Health Interventions for Low Health Literate Audiences. *Journal of Information Science*, **35(1)**, 82-93

Nielsen-Bohlman, L., Panzer, A., & Kindig, D. (Eds.). (2004). *Health Literacy: A Prescription to End Confusion*. Washington, D.C.: National Academy of Sciences.

Weiss, B., Mays, M., Martz, W., Castro, K., DeWalt, D., Pignone, M., Mockbee, J. & Hale, F. (2005). Quick Assessment of Literacy in Primary Care: The Newest Vital Sign. *Annals of Family Medicine*. **3**: 514-522

Whitten, P., Love, B., Buis, L., & Mackert, M. (in press). Health Education Online for Individuals with Low Health Literacy: Evaluation of the Diabetes and You Website. *Journal of Technology in Human Services.*, **26(1)**, 77-88