

Drivers and barriers to digital television adoption in Portugal: the perspectives of the TV viewers and other main stakeholders

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ABSTRACT

To understand what are the most significant factors for digital TV adoption by the Portuguese population in the switchover context is the main goal of the research project here presented. In April 26, 2012, the analogue terrestrial television switchoff is planned to occur in Portugal, according to the schedule published by the national telecommunication regulator Anacom. Digital terrestrial TV was launched in the country in April 2009, making Portugal one of the countries with a more ambitious schedule – or risky, depending on the perspective - for the full transition from analogue to digital terrestrial television.

In this paper we will start by presenting the research project's objectives, theoretical framework and research design. Next, we will present first results of the project focused on the barriers and drivers to digital TV adoption from two of the empirical studies which integrate it, namely, the quantitative inquiry administered to a representative sample of the Portuguese population and interviews with main stakeholders in the area of digital TV in Portugal. The perspectives of the television viewers are compared with other main stakeholders in this process. The paper will be concluded with a brief discussion of these results and a brief enumeration of next steps for the project.

Keywords

Diffusion and adoption of innovation, digital TV, TV audiences

1. INTRODUCTION

Flashforward to April 26, 2012. This is the first day of the rest of the life of digital TV in Portugal, when the analogue terrestrial television broadcast is switched off, according to the plan of the Portuguese telecommunications regulator Anacom. Television viewers, broadcasters, pay-TV operators, regulators and other stakeholders are evaluating the impact and the process of the analogue switchover: all things considered, was it a success?

Flashback to April 26, 2009. After a false start in 2001, digital terrestrial television (DDT) is finally launched in Portugal, making it one of the countries with a more ambitious schedule – or risky, depending on the perspective - for the full transition from analogue to digital terrestrial television. The late start can be seen both as an opportunity, since it can allow the major stakeholders to learn from similar switchover processes, or it can be seen as

a high risk, since there is less time to do everything necessary to ensure nobody is left without television access.

Back to early 2011: the public debate and even mere awareness about the switchover process has been almost nonexistent. Currently, DTT viewers have the same number of channels offered by analogue transmission: RTP 1 and RTP 2 (public broadcaster), SIC and TVI (commercial broadcasters.). A 5th free-to-air channel can be launched in the future, but its concession has been adjourned *sine die*, due to the exclusion of the only two contestants in a public tender promoted by the national media regulator Entidade Reguladora para a Comunicação Social – ERC [9]. The pay-TV DTT operation is also adjourned *sine die*, after the winner of the public tender for this operation Portugal Telecom (PT) decided to give up this license. Also, it should be noted that the national communication campaign about the analogue TV switchoff only began in mid March 2011.

Yet, the first public tender for the operation of the DTT network was launched in 2001, aiming for the attribution of a license for the establishment and operation of a DTT platform [5]. The winner was the consortium PTDP - Portuguese Digital Television Platform, formed by the new comer in the telecom sector Pereira Coutinho, the public broadcaster RTP and the commercial broadcaster SIC. After several delays from the consortium in launching the operation, the national telecom regulator Anacom revoked [4] the previously granted license on March 2003, considering that was it “not currently possible to define objectively a time limit for the commencement of the platform commercial operation in Portugal”, and also considering “national and international circumstances relating to the deployment of technical equipment and to the platform competitive conditions themselves”.

Finally, on the 26th February 2008 two new public tenders were released. The contestants were Portugal Telecom (PT) – applying for the multiplexers A (free-to-air) and B to F (pay TV) - and the Swedish venture Airplus TV - applying for the multiplexers B to F. On October 2008, Anacom and ERC endorsed the rights for the use of the multiplexers A and B to F frequencies, as well as the license for distribution operator to PT Comunicações, from the PT group [3].

Still, in early 2010, PT asked Anacom to revoke the licenses related to the multiplexers of paid DTT, justifying it with the significant changes that occurred within the pay TV market,

namely the increase of competition, which would reduce the competitive importance expected from the terrestrial platform. Anacom - without ERC's support – accepted PT claim [2]. The free DTT operation would officially begin in April 29, 2009, reaching a few regions of the country and about 30% of the population. At the moment, there are still no further plans regarding the pay-TV DTT service in Portugal.

2. PROJECT'S OBJECTIVES, THEORETICAL FRAMEWORK AND METHODOLOGY

2.1. Objectives

Therefore, all things considered, it is legitimate to ask if the interests of the television viewers are being properly addressed. If it is true that a switchover process can occur without major problems and in a transparent way, on the other hand, a badly planned and implemented transition process can have profound negative consequences, which include the possibility of confused viewers suddenly lose their television services [8].

To understand what are the most significant factors for digital TV adoption by Portuguese population in the switchover context is the main goal of the current research project. The secondary goal is to propose a set of recommendations to be applied by key stakeholders in Portugal, aiming to contribute effectively towards a more inclusive digital TV, to the promotion of efficient and effective communication, to the qualitative improvement of digital TV content and services and to the increased ease of use of this new broadcast technology.

The focus of this research project is on the people who do not have the intention to adopt digital TV. More precisely, our goal is to understand and identify the main factors that explain this intention, as well as their demographic and socioeconomic profile. The digital TV switchover process presents diverse challenges that go beyond the strict technology field, with serious economical and social implications [10]. Research can contribute with innovative solutions to the digitalization obstacles [17]. Also, research enables the reflection about what has been accomplished in diverse contexts, in order to avoid repeating past mistakes, as Roberto Suárez Candel notes [17], to whom monitoring the development of the migration towards digital television is necessary to introduce correction measures on time. Therefore, it is fundamental to understand people's attitudes towards digital TV, their concerns and worries, in order to communicate the correct messages and to assure that "nobody is left behind" in this transition process [11].

2.2. Theoretical framework

The transition from analogue terrestrial TV to digital terrestrial TV is a particular case of diffusion and adoption of an innovation, in which the adoption is both voluntary and involuntary, since there is a mandatory date to terminate the analogue broadcast. When reviewing the literature on the diffusion of innovations it is imperative to mention Rogers classic book *Diffusion of Innovations* [16], in which the author explains that the diffusion of new ideas - even after they are proven positive and beneficial - is a difficult task that should be planned in order to succeed. Rogers presents in this book several examples of innovations or new ideas that were not accepted and adopted, such as water boiling in a Peruvian village. The reasons that Rogers presents for the

majority of these failures are related with cultural beliefs of a given community of society, former traditions and habits, failure in the diffusion of the ideas on the local community and individuals that are more socially accepted, failure in including opinion leaders in the process of adoption of an ideas, perceptions of the target-audience about the change agent, messages not adequate to the needs and competences of the target-audience.

When tracing back the first authors to focus on the area of diffusion of innovation, Rogers mentions the French sociologist and criminologist Gabriel Tarde (1843-1904). Particularly in his work *Les lois de l'imitation* (1890), Tarde exposes a theory of innovation based on imitation and invention, which he considered as the elementary social acts. Yet, Tarde's proposals were not immediately followed by empirical studies in the area of diffusion: that would happen decades later, when north-American researchers looked into his work to better understand the innovation diffusion and adoption processes. The following nine traditions in the diffusion of innovations research field were identified by Rogers [16]: anthropology, early sociology, rural sociology, education, public health and medical sociology, communication, marketing, geography and general sociology. One of the most significant benchmarks in the field, noted Rogers, was the hybrid cord diffusion study in the Iowa state by Bryce Ryan and Neal Gross (1943), which set a new approach to the study of diffusion [16].

Also, before Rogers' book, George Beal and Joe Bohlen summarized the findings of 35 studies of how farmers accepted new ideas in the paper "The Diffusion Process" (1957), proposing a theoretical framework to everyone facing the challenge of diffusing new ideas and practices. In these studies, conducted over a period of two decades, the farmers were asked about their regular farm and home practices, their usage of pesticides, fertilizers and other agricultural techniques. After the analysis of these studies, Beal & Bohlen suggested that people accept new ideas over a mental process composed by, at least, five phases: the awareness stage, the interest stage, the evaluation stage, the trial stage and the adoption stage. Also importantly, Beal & Bohlen proposed five categories of people, based on the time of adoption, with significant differences in selected personal and social characteristics: the innovators, the early adopters, the early majority, the majority and non-adopters. Later, Rogers would propose similar categories of adopters that became the standard for years to come: the innovators, the early adopters, the early majority, the late majority and the laggards.

More recent studies in this field present other explanatory models of the diffusion and adoption of innovations. In 2003, Venkatesh, Morris, Davis & Davis proposed a unified model based on the most significant models in the area [18] – the *Unified Theory of Acceptance and Use of Technology* (UTAUT) -, defending that performance expectancy, effort expectancy, social influence and facilitating conditions are direct determinants of the usage intention and behavior in the adoption of innovations. In the UTAUT model, the performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance: the five related constructs are perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations. On the other hand, the effort expectancy is defined as the degree of ease associated with the use of the system: perceived ease of use, complexity and ease of use are the related constructs. Social influence is the degree to which an individual perceives that important others

believe he or she should use the new system: subjective norm, social factors and image are the related constructs. Finally, facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system: perceived behavioural control, facilitating conditions and compatibility are the different constructs that this definition captures. Also, there is the intention of evaluating the constructs of self-efficiency, anxiety and attitudes towards techniques, which Venkatesh et al. considered not to be directly determinants of the intention of use.

The impact of these four constructs is mediated by age, gender, experience and voluntariness of use. The UTAUT was developed through the revision and consolidation of eight theories of technology diffusion and acceptance, namely: theory of reasoned action, the technology acceptance model, the motivational model, the theory of planned behavior, a model combining the technology acceptance model and the theory of planned behavior, the model of PC utilization, the innovation diffusion theory, and the social cognitive theory. In the specific area of digital TV adoption, the UTAUT model has been applied in several research projects, such as the field investigations developed in Italy in the framework of the T-government projects [15].

The project's theoretical framework follows the model of the Unified Theory of Acceptance and Use of Technology – UTAUT [18]. The main research hypothesis is the following: in the context of switchover, digital TV adoption is significantly conditioned by factors of performance expectancy, effort expectancy, social influence, with a strong probability of rejection among population segments such as the elderly, people with less experience in technology uses and people with special needs. All these factors constitute heavy barriers to technology adoption.

2.3. Methodology

The research design combines quantitative and qualitative methods, according to the best practices applied in project of similar scope [11] [12] [7].

- 1) Ethnographic study, to take place in the households of 30 Portuguese families with different characteristics, with the objective of exploring in context what are their attitudes regarding digital TV and what uses they give to television and other media, among other issues;
- 2) Interviews with stakeholders, to gather the views of major players in this specific field, namely, broadcasters, pay-TV operators, DTT operator, regulatory institutions, representatives of people with special needs, etc;
- 3) Quantitative survey, to be applied to a representative sample of the Portuguese population, with approximately 1.200 participants, with the overall objective to determine the main adoption and rejection factors of digital TV usage;
- 4) Usability study, with a sample of 20 users, to make a comparative analysis of the main digital TV systems in the Portugal in terms of ease of use and overall satisfaction.

Also, this research project has the intention of analyzing significant statistical differences in the adoption of digital TV among Portuguese regions (distritos), urban and rural areas, age groups, income levels, professional occupation, school level attained, as well as levels of visual, hearing and cognitive impairments. In complement to the statistical data, the main conclusions of the ethnographical study will hopefully allow the research team to obtain an holistic view of the everyday life of different families and, in particular, to have a deeper

understanding of the issues related with the concepts of social influence, effort expectancy, self-efficiency, anxiety and attitudes towards digital TV and new technologies. Finally, there is the intention of conducting a comparative usability study between the main digital TV systems in the Portuguese market, in order to better comprehend the issues related with the concepts of performance expectancy, effort expectancy and facilitating conditions.

The project formally started in April 2010 and it will be concluded in late September 2011. The project is funded by Fundação para a Ciência e Tecnologia (FCT), the Portuguese government body responsible for financing and evaluating the national scientific and technological system. In summary, this research project aims to contribute for a better understanding of the challenges being faced during the short-medium term regarding the switchover process and, in practical terms, to contribute to a more inclusive digital TV. In the following pages, we will focus on the specifically on the main drivers and barriers for digital TV adoption, in the perspectives of the television viewers and other main stakeholders in this process.

3. PROJECT'S EMPIRICAL STUDIES: OBJECTIVES, METHODS, FIELDWORK

3.1. Ethnographic study

Regarding the empirical components of the project, firstly, the ethnographical study started October 2010, taking place at the households of 30 Portuguese families resident in the three pilot-areas (Alenquer, Cacém, Nazaré) in which the switchoff will first take place during 2011, as defined by the telecom regulator Anacom. The main objectives are to explore in context what are their awareness and attitudes regarding digital TV and the switchoff, as well as what uses they give to television and other media.

Also, there is the intention of understanding how these families adopt new information and communication technologies or new equipments of domestic or personal entertainment, as well as what are their learning styles: for instance, if they are self-effective or if they refer to their the social network to obtain counseling or help to use new equipments or new services. Finally, the participants are asked to project in the future their preferences regarding television: what they would like to see or obtain through television, what would be their ideal television today and what would be their ideal television in a near future.

It should be noted that this sample includes families with at least one member aged 65 or more and, also, families with at least one member with special needs, in order to obtain a better perception of the specific characteristics of these populations regarding digital TV. The ethnographic observation sessions and the in-depth interviews are recorded on video, for text transcription, codification and analysis, using the NVivo8 qualitative analysis software to support these tasks. In this paper, we will focus on the results of the quantitative inquiry and interviews with stakeholders.

3.2. Quantitative inquiry

The quantitative inquiry to a representative sample of the population is conducted in parallel with the ethnographic study. The instrument was based on the previous survey conducted by

the national communication observatory OberCom [6] with the necessary adaptations necessary for this research project.

The instrument was refined with inputs from all the partners and a pre-test was made during October 2010, involving 14 individuals, in order to detect areas of improvement and accordingly correct the instrument. The same conditions of the application of the instrument were replicated, meaning that the participants in the pre-test were interviewed at home.

The final questionnaire was applied to a representative sample of the Portuguese population with more than 18 years of age, composed by 1.205 participants, in their own households by a team of interviewers from the market studies company GfK. Overall, the instrument was composed by a total of 33 questions and 22 characterization items.

Regarding the main characteristics of the sample, the 1.205 individuals were aged between 18 and 92 years (average age 45,23), of which 48,9% were male (n=589) and 51,1% were female (n=616). Regarding the age distribution, 18 to 24 years were 11%, 25-34 years were 21%, 35-44 years were 19,1%, 45-54 years were 18,2%, 55-64 years were 13,3% and 65 years and plus were 15% of the total sample. About nationality, 96,3% of the survey participants are Portuguese. The remaining respondents are from Brazil, Ukraine, Cabo Verde and other nationalities. The respondents were selected by a quota method, based in a matrix which crossed variables such as gender, age, education level, occupation, region and habitat/ size of the place of residency. GfK applied it during November 2010, at the participants' households by a total of 68 interviewers through a direct and personal interview. The data was analyzed with SPSS software.

3.3. Interviews with stakeholders

The preparation and fieldwork for the interviews with the stakeholders was also done simultaneously with the ethnographic study fieldwork and quantitative survey. The main goal of these interviews is to get a sense of the different perspectives of these actors regarding the switchover process, namely, broadcasters, pay-TV operators, DTT operator, regulatory institutions, representatives of people with special needs, etc. Therefore, we conducted a series of interviews, questioning these stakeholders about the main drivers and barriers to digital TV adoption and other issues relevant for the research project. The instrument for the interviews was composed of 13 open-ended questions.

The participants in the study were contacted by email, phone and letter during last October and November: most the responses were obtained during November and December 2010. A total of 16 interviews were collected until early January 2011. The vast majority of the participants preferred to respond to the interview by email: only the media group Impresa, the public broadcaster RTP and the national media regulator ERC preferred a face-to-face interview to be conducted (in this case, the researcher prepared a transcript of the interview, which was later validated by the interviewee). Among these stakeholders, we find the national regulators for the telecommunications industry (Anacom) and media (ERC), as well as the telecom operators Portugal Telecom, ZON, Sonaecom, the media groups RTP, Mediacapital and Impresa and the consumers' representative institution DECO. The full list of participants who replied to the request is the following:

- **ANACOM**, Portuguese telecommunications regulator

- **ERC** - Entidade Reguladora para a Comunicação Social, Portuguese media regulator
- **RTP**, public service broadcaster
- **MediaCapital**, Media group – owner of the free-to-air commercial channel TVI
- **Impresa**, Media group – owner of the free-to-air commercial channel SIC
- **Portugal Telecom**, Telecom Operator – free-to-air TV (DTT) and pay TV (IPTV), internet, mobile, fixed phone
- **Sonaecom**, Telecom Operator - Pay TV (IPTV), internet, mobile
- **ZON**, Telecom Operator - Pay TV (cable, DTH), internet, mobile
- **DECO**, Portuguese association for consumers
- **APD** - Associação Portuguesa de Deficientes, Portuguese association for people with special needs
- **APAP** - Associação Portuguesa das Empresas de Publicidade e Comunicação, Portuguese association of advertising and communication companies
- **APED** - Associação Portuguesa de Empresas Distribuidoras, Portuguese association of distribution companies
- **APIT**, Portuguese association of independent video producers
- **APMP** - Associação para a Promoção do Multimédia e da Sociedade Digital, Portuguese association for the promotion of multimedia and the digital society
- **Jorge Ferraz Abreu**, Researcher specialized on digital interactive TV and university professor
- **Sérgio Denicoli**, Researcher specialized on digital TV in Portugal

The 16 interviews gathered in the course of this empirical study fieldwork were codified and analyzed with support of the qualitative analysis software NVivo8. For the purposes of this paper, we will focus on three specific questions, addressing the barriers and drivers of digital TV adoption in Portugal:

Q1. What are the main arguments which can convince the Portuguese viewers to voluntarily adopt digital TV?

Q2. What can motivate or serve as an incentive for the most reluctant Portuguese viewers to acquire a television set or set-top box to receive digital TV?

Q4. What are the main obstacles or barriers to the full adoption of digital TV in Portugal?

4. DIGITAL TV ADOPTION: PAY-TV PENETRATION, SWITCHOFF AWARENESS, ACQUISITION INTENTION

4.1. TV and Pay-TV penetration

Before further exploring the main drivers and barriers for digital TV adoption in Portugal, it is fundamental to provide some background information about the percentage of quantitative inquiry respondents who have TV at home, the percentage of respondents who have pay-TV at home and also, importantly, the percentage of these respondents who are aware of the switchover deadline and their willingness to acquire the necessary equipments to continue receiving free-to-air TV.

First, out of the 1.205 participants in the quantitative inquiry, **99,4% of the sample replied that they have at least one TV set at home** (n=1.198). Of these 1.198 respondents, 54,7% have pay

TV at home (n=655), which means that **45,3% of the total sample only receives free-to-air TV at home** (n=543). The most similar figures available are provided by the Portuguese telecommunications regulator Anacom [1], which estimated that in the first trimester of 2010, the pay-TV subscribers in Portugal were 47,5 per 100 households, based on the figures provided by the pay-TV operators (2,7 million pay-TV subscribers). Using the number of families estimated by the Portuguese National Institute of Statistics for 2009, Anacom estimated that the penetration of pay-TV in Portugal among classic families is 66 per cent.

More specifically, the 45,3% of participants who only receive free-to-air TV were asked how do they receive TV at home (Q.9). Therefore, **96,7% of the respondents claimed to have analogue terrestrial TV**, 1,8% free-to-air direct-to-home, 1,1% digital terrestrial TV and 0,7% preferred to not answer to this question.

4.2. Switchoff awareness and attitudes

Less than a year and half for the complete switchoff of the analogue terrestrial broadcast – defined for April 26, 2012 – a total of **92,2% of the participants in this survey do not know when the switchoff will take place** (Q.26). Out of the 1.198 respondents, 7,8% correctly identified 2012 as the year analogue terrestrial TV will come to an end, while 85,4% claimed they did not know when, 6,1% identified 2011 as the year of the switchoff and 0,7% pointed to 2013.

Table 1. Q.26. Do you know when will is the switchoff planned to occur? (n=1.198)

	No, I don't Know %	Yes, 2011 %	Yes, 2012 %	Yes, 2013 %
18 to 24 years	87,1	5,3	6,8	0,8
25 to 34 years	78,2	11,5	9,1	1,2
35 to 44 years	81,2	4,4	13,1	1,3
45 to 54 years	87,5	5,1	7,4	0
55 to 64 years	87,5	5,6	6,3	0,6
65 and more years	95,5	3,4	1,1	0
TOTAL sample	85,4	6,1	7,8	0,7

The respondents between the age of 35 and 44 were the best informed about the switchoff year, with 13,1% correctly answering the year 2012. On the case of individuals with 65 years of age and more is where we find significant differences compared with other age groups. This way, 95,5% of the respondents with 65 or more years replied that they do not know when the switchover will take place, with only 1,1% identifying correctly the switchoff year, a percentage well below the 7,8% of the total sample. In total, **98,9% of the individuals with 65 years and more do not know when the switchoff is planned to occur.**

To further explore the attitudes towards the switchover process (Q.27), we asked the participants to express their level of agreement with a set of questions, which were based on Ofcom's study "Attitudes to Digital Switchover" [14], namely on Q.31. Regarding the results obtained in our survey, **the costs are the main concern made manifest by the respondents in this survey**, with 60,6% of the participants agreeing with the statement "My big concern is cost". This is followed by the

practical issues associated with digital TV, with 49,8% of all the participants claiming to be concerned with these aspects.

Table 3. Q.27. To which degree do you agree with each of these statements about the switchover process? (n=1.198)

	-2 %	-1 %	0 %	+1 %	+2 %	DK/DR %
It's fine. Not a problem	5,4	15,5	21,6	36,3	5,9	15,1
I am happy with the end of digital TV, even if there is some inconvenience	7,3	21	28,3	26,6	2,6	13,9
I am surprised - I didn't know it would be done so soon	4,3	13,9	20,7	36,9	11,4	12,7
I am angry or anxious about being forced to change	3,8	17,9	31,7	25,6	7,1	13,8
This process should take longer, in order to give people the opportunity to obtain more information	1,3	8,1	22,1	35,6	17,9	15,1
My biggest concern is the cost that I will have with this transition	1,3	6,8	18,4	37,4	23,2	12,8
I am worried about practicalities, such as getting a new antenna or new equipments functioning properly	2,2	12,2	22,1	36,5	13,3	13,8
I really don't believe the analogue terrestrial broadcast will be switchoff in 2012	1,6	11,9	33,3	22,3	4,2	25,6

(note: -2= "Completely disagree"; -1= "Disagree"; 0="Neither agree or disagree"; +1= "Agree"; +2= "Completely Agree"; DK/DR= "Doesn't know or doesn't reply")

Also, to notice the 43,5% of the participants who agreed with the statement "I think that this process should take longer, in order to allow people to get more information" and the 48,3% who agreed with "I am surprised - I didn't know it would be done so soon".

4.3. Acquisition intention

When asked about the equipments or services that they were considering buying over the next 12 months (Q.28), out of the 525 respondents in the survey who previously mentioned that they had free-to-air analogue terrestrial TV, **45,5% do not know or did not reply if they have the intention of acquiring equipments or services for the reception of digital TV.**

Table 4. Q.28. What equipments or services are you considering acquiring over the next 12 months? (n=525)

	TV with DDT %	DTT set-top box %	Cable, DTH (pay-TV) %	IPTV, fiber (pay-TV) %	None %	Don't know/ Don't reply %
18 to 24 years	17,9	12,8	23,1	0	23,1	33,3
25 to 34 years	6,6	8,8	5,5	2,2	28,6	51,6
35 to 44 years	10	16,7	8,9	1,1	18,9	51,1
45 to 54 years	10,1	6,7	5,6	2,2	31,5	47,2
55 to 64 years	7,3	6,1	3,7	0	45,1	37,8
65 and + years	2,5	2,5	1,7	1,7	47,9	43,8
TOTAL sample	7,8	8	6,3	1,3	34,1	45,5

(note: the respondents could select more than one option)

Also importantly, **34,1% of these participants claimed to have no intention of acquiring equipments or services for the reception of digital TV**. Finally, 23,4% claimed to have the intention of buying equipments or services for the reception of digital TV over the next 12 months, with 8% predicting to buy a DTT set-top box, 7,8% planning to buy an integrated DTT TV set, 5,8% considering subscribing a cable TV service, 1,3% a fiber-optics TV service and 0,4% a DTH service.

Again, the age variable has a significant impact on the intention of buying equipments or services for the reception of digital TV, particularly on the respondents over the age of 55: **45,1% of the individuals aged 55 to 64 and 47,9% of those aged 65 or plus do not have the intention of acquiring a digital TV equipment or service**. The individuals aged 18 to 24 are the ones who are most considering buying digital TV equipments – 30,7% - or services – 23,1%.

Finally, about when these respondents are considering buying integrated DTT TV set or a DTT set-top box, 53,1% do not know or did not reply to this question (Q.29), while 30,5% of these individuals claimed that they would only do it when it is mandatory. Significantly, **12,4% of these respondents with analogue terrestrial TV claimed that they will never buy a integrated DTT television set or a DTT set-top box**.

5. DIGITAL TV ADOPTION: MAIN DRIVERS

Regarding the main motive to have DTT (Q.30), 36,5% of the participants with analogue terrestrial TV do not know or did not reply to this question. From the options listed on the survey, 25,7% of these respondents pointed to the mandatory analogue TV switchoff as main motive to have DTT.

Table 5. Q.30. What is your main motive to have DTT? (n=525)

	%	n
Quality of image and sound	13,7	72
Mandatory analogue TV switchoff	25,7	135
HD free of charge	1,9	10
New services (EPG, etc)	0	0
Other motives	1,3	7
None	23,6	124
Doesn't know/ Doesn't reply	36,5	193

(note: the respondents could select more than one option)

The quality of image and sound was selected by 13,7% of these individuals and 1,9% identified high definition as the main motive. It should be noted that **23,6% of these respondents claimed that they have no motive for adopting DTT**.

Particularly relevant is the high percentage of viewers with more than 65 years that claimed to find no motive to have DTT - 37,2%, after being explained that it is necessary to have a proper equipment to continue receiving TV or to subscribe a digital TV service, as well as the high percentage of these respondents that don't have an opinion or declined to reply to his question - 47,1%. The quality of image and sound is a relevant argument mostly for the respondents between the ages of 18 to 54, but the fact that analogue terrestrial TV will come to an end soon it is a more relevant motive in all the age groups. The possibility of having free HD channels is mostly a motive for the respondents with 35

to 44 years -5,6% - and 45 to 54 years -3,4%-, was well as 25 to 34 years - 2,2% -, with no one above 55 years selecting the option.

Table 6. Q.30. What is your main motive to have DTT? (n=525)

	Quality image sound %	Switch-off %	HD free %	Other %	None %	DK/DR %
18 to 24 years	23,1	35,9	0	2,6	10,3	35,9
25 to 34 years	16,5	33	2,2	1,1	16,5	33
35 to 44 years	20	26,7	5,6	1,1	17,8	34,4
45 to 54 years	16,9	32,6	3,4	1,1	18	31,5
55 to 64 years	9,8	25,6	0	1,2	32,9	32,9
65 + years	3,3	12,4	0	0,8	37,2	47,1

(note: the respondents could select more than one option)

A similar question was made to the stakeholders, namely, what are the main arguments that can convince the Portuguese viewers to voluntarily adopt digital TV? (Q.1). In the case of the interviews with stakeholders, this was an open-end question, in order to allow these participants to fully express their respective perspectives on the subject. The main motives or drivers for the adoption of digital TV by the Portuguese viewers, in the view of these 16 stakeholders, were the following:

- 1) improved quality of image and sound, with 13 references (ANACOM, APAP, APD, APIT, APMP, DECO, ERC, Abreu, MediaCapital, PT, Impresa, Sonaecom, ZON)
- 2) new services and functionalities, with 7 references (APD, APED, APMP, Abreu, PT, Sonaecom, ZON)
- HD or 3D, with 7 references (DECO, ERC, MediaCapital, Sonaecom, ZON, Abreu, RTP)
- 4) more TV channels: 5 references (DECO, ERC, MediaCapital, ZON, RTP)
- 5) mandatory switchoff of analogue TV: 4 references (ANACOM, APAP, Impresa, ZON)
- 6) a 5th free-to-air TV channel: 3 references (APIT, Denicoli, Abreu)
- 7) low cost: 2 references (APED, MediaCapital)
- DTT with no advantages or perceived advantages: 2 references (Denicoli, DECO)
- 9) accessibility services for people with special needs: 1 reference (APD)
- free radioelectric spectrum: 1 reference (Abreu)
- interior and mobile reception of TV: 1 reference (ANACOM)
- interoperability, technical issues: 1 reference (MediaCapital)
- paid packages with other services: 1 reference (MediaCapital)

Therefore, the main argument for the adoption of digital TV is for the 16 stakeholders interviewed in the study, the **improved quality of image and sound**, mentioned by 13 of these participants. The particular case of HD and 3D broadcast was mentioned by 7 of these stakeholders. Yet, comparing these results with the quantitative inquiry, we observe that only 13,7% of the respondents identified the quality of image and sound as a main motive to have DTT. In a previous question in the quantitative survey, the respondents were asked to evaluate the quality of image and sound received at home (Q.16), from 0 (completely unsatisfied) to 10 (completely satisfied). Only 1,9%

of the respondents claimed to be unsatisfied or very unsatisfied (0 to 4 points, in a scale of 10) and 13,6% manifested to be moderately satisfied (5 and 6 points, out of 10). The vast majority considered themselves to be satisfied or very satisfied with the TV quality of image and sound received at home, with 83,9% evaluating it with 7 to 10 points, with 0,5% of the respondents preferring not to answer this question.

Also, **new services, functionalities and interactivity** were the mentioned by 7 of the 16 stakeholders as one of the main arguments which could enable the voluntary adoption of digital TV. Yet, when the viewers were asked to choose one of several options as main motive to obtain DTT, of the 525 participants in this inquiry only with free-to-air TV at home, no one selected this option.

Regarding the **5th free-to-air** and **more channels**, again comparing with the results of the quantitative survey, there is a substantial difference between the perspectives of the main institutional and industry stakeholders and the responses of the Portuguese viewers. When asked if they wanted to have more TV channels (Q.13), 86,9% of the respondents replied that did not wish more TV channels, meaning that only 13,1% claimed to want more TV channels. In the case of the 16 stakeholders consulted for this study, this was the fourth main motive mentioned, with 5 stakeholders considering this to be a main driver for adoption (DECO, ERC, MediaCapital, ZON).

On the other hand, the **mandatory switchoff of analogue TV** was pointed out by 25,7% of this representative sample of the Portuguese population as a main motive to obtain DTT, becoming the second option chosen by these respondents, after “doesn’t know/ doesn’t reply”. In the case of the stakeholders, this motive was referenced by 4 of the 16 participants in this sample - namely by ANACOM, APAP, Impresa and ZON.

The second question in the stakeholders study was about the reluctant adopters of digital TV, in order to perceive what kind of measures could be taken to better enable a smooth process of transition for these viewers. Regarding the incentives for reluctant populations, the stakeholders referred to the above mentioned arguments:

- 1) mandatory switchoff of analogue TV: 6 references (ANACOM, APAP, DECO, PT, Impresa, Sonaecom)
- improved quality of image and sound: 6 references (ANACOM, APMP, Denicoli, ERC, RTP, Sonaecom)
- 3) low cost or costs compatible with income: 4 references (APD, APED, Abreu, MediaCapital)
- 4) a 5th free-to-air TV channel, more channels or content: 3 references (APIT, ERC, Sonaecom)
- 5) free or subsidized reception equipments: 2 references (APD, Impresa)
- 6) HD and/or 3D: 2 references (Denicoli, RTP)
- 7) new services and functionalities: 1 reference (Sonaecom)
- interior and mobile reception of TV: 1 reference (ANACOM)
- management of radioelectric spectrum: 1 reference (APMP)
- DTT with no incentive for adoption or perceived incentives: 1 reference (DECO)

6. DIGITAL TV ADOPTION: MAIN BARRIERS

In order to explore the motives behind the reluctance in having digital TV/ DTT, the 124 individuals who claimed to find no motive to have DTT – which represent 10,3% of the total sample in the quantitative survey - were asked to indicate their level of agreement with a set of statements (Q.31). Again, the basis of this question was Ofcom’s study [14]. This way, 77,9% of these participants agreed with the statement “I’d like to be able to continue to watch TV, but it’s a matter of cost”. The difficulty in knowing what to do in order to have digital TV was identified in second place in this list, with 62,1% of these individuals agreeing with the statement “I don’t know how to get digital TV. It’s all too complicated”.

Table 7. Q.31. To which degree do you agree with each of these statements? (only for individuals who claimed to find no motive to have DTT; n=124)

	-2 %	-1 %	0 %	+1 %	+2 %	DK/ DR %
TV is not important to me, so I am not going to bother to change over	3,2	21	21,8	36,2	4	13,7
I don't want digital TV in my household	1,6	15,3	20,2	36,3	10,5	16,1
I'd like to be able to continue to watch TV, but it's a matter of cost	0,8	2,4	9,7	62,9	15,3	8,9
I don't know how to get digital TV. It's all too complicated	0	8,1	12,9	50,8	11,3	16,9
I'd like to be able to continue to watch TV, but I don't know how I'd get it installed and set up	0,8	9,7	16,9	43,5	8,9	20,2
I'd like to be able to continue to watch TV, but I don't think I'd ever be able to understand how to use digital TV	1,6	15,3	23,4	27,4	8,1	24,2

(note: -2= “Completely disagree”; -1= “Disagree”; 0= “Neither agree or disagree”; +1= “Agree”; +2= “Completely Agree”; DK/DR= “Doesn’t know or doesn’t reply”)

In this case, there is concordance between the main barriers or obstacles to the full adoption of digital TV in Portugal referenced by TV viewers in the quantitative survey and the perspectives of the stakeholders, with costs being the most referenced barrier by these participants:

- 1) costs, with 9 references (APAP, APD, APED, APMP, Denicoli, Abreu, PT, RTP, Sonaecom)
- 2) absence or insufficient information for viewers, with 7 references (ANACOM, APAP, APD, DECO, ERC, MediaCapital, Sonaecom)
- 3) lack of advantages or perception of advantages of DTT, with 6 references (APED, DECO, Denicoli, MediaCapital, Impresa, RTP)
- 4) market conditions: 3 references (Denicoli, Abreu, MediaCapital)
- 5) absence of HD broadcast: 2 references (ANACOM, PT)
- absence of 5th free to air channel and other channels: 2 references (ANACOM, PT)

- low technological literacy: 2 references (ANACOM, APMP)
- 8) Government action and model for DTT: 2 references (Denicoli, RTP)
- 9) context of economical crisis: 1 reference (Denicoli)
- insufficient coverage: 1 reference (MediaCapital)
- duration of the transition process: 1 reference (APMP)
- age and gender of the viewers: 1 reference (APMP)
- mandatory action for the viewers: 1 reference (APIT)
- web usage: 1 reference (Abreu)

Curiously, the **issue of cost** was mentioned by the DTT free-to-air operator, Portugal Telecom, that considered the price of the DTT decoder equipments as “a set back” for the expansion of DTT in Portugal “since until not that long ago there were no equipments in the market compatible with the Portuguese DTT standard, both in quantity and in affordability”. On the other hand, for the national association that represents the consumers - DECO – the main problem for the very weak adoption to the new platform by the Portuguese “are the lack of information, in conjunction with the **reduced added value that DTT introduces**”. The **absence or insufficient of information for viewers** was the second more referenced barrier by these stakeholders, with the national media regulator considering that “the main barrier that exists at this moment is the lack of information”, further developing its perspective by recommending that the transition should be explained to the consumers almost as if it was a direct sale.

7. NEXT STEPS

In this paper, we briefly addressed the main drivers and barriers to digital TV adoption in Portugal, comparing the perspectives of the TV viewers with the perspectives of other main stakeholders in the switchover process. The relevance of this comparison goes beyond a mere academic exercise, since it is reasonable to expect that a greater concordance between the perspectives of the stakeholders with effective power in their hands - such as the Government, regulators, DTT operator and the main broadcasters - and the perspectives of the viewers will result in a more successful process for the all the parties involved. Particularly to TV viewers, who are the vast majority of the population impacted and who have quite limited influence in the overall planning and organization of the process. As the deadline for the analogue terrestrial TV switch-off approaches, to understand how the process is impacting viewers is key to improve the strategy and the tactics for a successful transition from analogue to digital. Regarding the next steps, the research team is in the process of conducting the usability study, with a sample of 20 users, with the objective of making a comparative analysis of a selection of DTT set-top boxes in the Portugal in terms of ease of use and overall satisfaction.

As a final outcome, the project team will present a set of recommendations for regulators and key stakeholders involved in the digital TV switchover, aiming this way to contribute for a better understanding of the challenges being faced during the short-medium term regarding this process and, in practical terms, to contribute both in Portugal and other countries in similar situation to a more inclusive digital TV.

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