

Incentives and Barriers to the Adoption of Digital Terrestrial Television in Portugal: Perspectives of the stakeholders involved in the transition process

Ágata Sequeira¹

Iolanda Veríssimo²

Célia Quico³

Abstract: *The success of the transition from analogical terrestrial television to digital terrestrial television – process also known as switch-over – requires the identification of barriers and drivers among the impacted population. Therefore, the study in which this article is based had as main purpose to understand exactly what are those barriers, in order to produce a valid contribution to the several decision makers, and to be able to contribute to a more inclusive television, accessible and transversal to the whole of the population. In that sense, one of the phases of the project consisted in several interviews to key stakeholders in the transition process, the results of which and subsequent recommendations are presented in this article.*

Keywords: *Diffusion and Adoption of Innovations, Digital TV, Audiences.*

¹ Ágata Sequeira, PhD student in Sociology and master in Sociology of Culture and Communication by ISCTE. Researcher at Universidade Lusófona de Humanidades e Tecnologias. Email: agata.sequeira@gmail.com

² Iolanda Veríssimo, master's student in Journalism and graduated in Communication Sciences by Universidade Nova de Lisboa. Researcher at Universidade Lusófona de Humanidades e Tecnologias. Email: verissimo.iolanda@gmail.com

³ Célia Quico, PhD in Communication Sciences by Universidade Nova de Lisboa. Teacher and researcher at Universidade Lusófona de Humanidades e Tecnologias. Email: celia.quico@gmail.com

Introduction

The definitive switch-off of the terrestrial analogical TV broadcasts in Portugal has taken place in the 26th of April 2012. Just as it has been happening in other European countries, this was replaced by Digital Terrestrial TV (DTT) – which is aligned with the technological modernization in the field of TV broadcast that has been taking place mostly since the 90s in the last century.

This event naturally demands a preparation that is not only technological but mostly of social nature, since if viewers want to continue to watch free-to-air TV they will have to adopt digital television – DTT or other solution the market may offer – with all that it implies in terms of compatibility with their domestic devices.

Several measures have been subject to debate in the sense of making this transition process easier – such include subsidization of decoding devices to the segments of the population with more economical difficulties, or the investment in information campaigns so that when the moment of the definitive switch-off arrives, all the previous process has worked out effectively. On the other hand, in what concerns the offer of TV products, there is also a series of proposals that have been made to make the DTT service more appealing to the people, namely the creation of a 5th channel, the introduction of HD and 3D contents, or even free regional channels, for example.

The ADOPT_DTV Project

This is the context of the project “ADOPT_DTV: Barriers to digital television adoption in the context of the digital switchover” (PTDC/CCI-COM/102576/2008), which had as main objective to understand which are the most significant factors to the adoption of digital TV by the Portuguese population, as well as to propose to the main stakeholders in this process in Portugal, a series of practical recommendations, in order to effectively contribute to a more inclusive digital television, to the promotion of a more efficient communication, to the qualitative improvement of digital TV content and user friendliness.

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. The project's theoretical framework follows the Venkatesh, Morris, Davis and Davis (2003) *Unified Theory of Acceptance and Use of Technology* (UTAUT) model and its main research hypothesis is the following: in the switchover context, the adoption of the digital TV 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 use and people with special needs. All these factors constitute heavy barriers to the adoption of technology.

The research design combines quantitative and qualitative methods, namely:

- 1) Ethnographical study with 30 Portuguese families, in order to explore in natural context which are their attitudes towards digital TV and what uses do they give to television and other media, among other questions;
- 2) Interviews to the several involved stakeholders, with the intent to understand the different perspectives of the main involved entities in this process – that is, free-to-air TV channels, pay-TV operators, the DTT operator, regulatory institutions, consumers representatives, representatives of people with special needs, among others;
- 3) Quantitative survey, to be applied to a representative sample of the Portuguese population, with the main goal of determining the main factors of adoption and rejection associated with the digital TV;
- 4) Usability study, with a sample of 20 users, in order to proceed to a comparative analysis of some of the main digital TV systems in Portugal, in terms of user friendliness and general satisfaction.

The project formally started in April 2010 and it was concluded in late October 2011. The project was 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.

Interviews to the stakeholders

In this paper we will focus on the second empirical study that integrates this research project, by analyzing the replies given by 16 relevant stakeholders in this field in Portugal. The main objective of these interviews was to obtain the different perspectives of the interested parts in this transition process, which are free-to-air TV channels, pay-TV operators, the DTT operator, regulatory institutions, consumer representatives, representatives of people with special needs, among others. Each interview consisted of 13 open questions. The participants were contacted via e-mail, telephone and letter from October to November 2010. Most of the answers were obtained in November and December 2010. A total of 16 interviews was gathered until late January 2011. Most of the participants preferred to answer via e-mail, having the SIC/Impresa, ERC and RTP opted by face-to-face interview, which was in these three cases later transcribed and validated by the interviewees. The interviewed organizations and people were the following:

- ANACOM, the Portuguese Regulator for the Telecommunications;
- ERC (Entidade Reguladora para a Comunicação Social), the Regulatory Entity for the Social Communication;
- RTP - media group, to which belong the free-to-air channels RTP1 and RTP2;
- Impresa – media group, to which belongs the free-to-air channel SIC;
- Media Capital – media group, to which belongs the free-to-air channel TVI;
- Portugal Telecom, telecommunications operator, which detains the license for free-to-air DTT, as well as IPTV services, internet and mobile communications;
- Sonaecom, telecommunications operator - IPTV, internet and mobile communications;
- ZON, telecommunications operator - cable TV, DTH, internet, mobile communications;
- DECO - Associação Portuguesa dos Consumidores, Portuguese Consumer's Representative;
- APD - Associação Portuguesa de Deficientes, Portuguese Disabled People's Representative;
- APAP - Associação Portuguesa das Empresas de Publicidade e Comunicação, Portuguese Association of the Advertising and Communication Companies;

- APED - Associação Portuguesa de Empresas Distribuidoras, Portuguese Association of the Distributing Companies;
- APIT – Associação Portuguesa de Produtores de Vídeo Independentes, Portuguese Association of the Independent Video Producers;
- APMP - Associação para a Promoção do Multimédia e da Sociedade Digital, Association of the Promotion of Multimedia and Digital Society;
- Jorge Ferraz Abreu, researcher specialized in the field of interactive digital television of the University of Aveiro;
- Sérgio Denicoli, researcher specialized in digital television of the University of Minho.

All of the 16 interviews obtained were later coded and analyzed with support of the qualitative research software NVIVO8. The interviews included such questions as what are the main incentives and barriers to the adoption of digital TV by the population, namely, which arguments the stakeholders would consider more valid to the adoption of digital TV; which incentives would they consider to be effective in the adoption of digital TV by the Portuguese; which position would they defend in relation to the question of the subsidization of decoding boxes; which are the main barriers to the adoption of digital TV in Portugal; which perspectives do they have towards the creation of a 5th TV channel in the process of transition from analogical to digital TV; which recommendations would they give in order for this process to be effective; how to reach the more vulnerable populations; how do they evaluate the information campaigns that have been promoted; how do they stand in what concerns the question of the digital dividend; how do they define the role of the governments in this transition process; and what do they defend to be the role of the main parts involved: RTP, ANACOM and PT.

We will now proceed to the analysis of the results obtained through the interviews, according to these key topics.

1. Analysis of the results obtained through the interviews to the stakeholders

1.1. Arguments to the adoption of digital TV

The success of the process of adoption of digital TV – of which DTT is a particularly important case – lies in good measure in effectively trying to convince the population that it presents advantages towards the analogical terrestrial television. In this sense, it is important to know which are exactly the pro arguments to its adoption, that may be determinant in this transition process.

One of the most mentioned aspects, in the context of the several interviews to the stakeholders that took place, was the fact that the better quality of image and sound in digital TV would be a recognizable asset that the Portuguese population would value. This aspect is particularly relevant to the residents in zones where the reception signal by the analogical terrestrial TV is weaker, since the digital TV and in particular DTT allow the quality of image and sound to increase.

Associated to the question of the quality of image and sound, a factor that was evaluated as having considerable attraction potential to the Portuguese population is the possibility that, through DTT, can be made possible the transition to an HD format broadcast for all free-to-air channels or for a 5th channel, or even the possibility of having some programs broadcasted in 3D format.

The creation of a 5th channel in free-to-air was seen by the stakeholders as a potential advantage for the Portuguese users of DTT. However, this is a question that raises some controversy, as none of the proposals that were presented to the ERC (Regulatory Entity for the Social Communication) for the creation of a 5th channel in free-to-air was until now approved.

The increased offer of generalist channels via free-to-air DTT is also a measure to be valued by the population, despite in practical terms it is considered by some of the entities that were interviewed as a remote possibility (according to DECO – Portuguese Consumer's Representative – the fact that Multiplexer A supports only one more channel, plus the characteristics of this market in Portugal, are factors that inhibit a bigger offer).

On the other hand, one of the consequences of the shift from analogical terrestrial TV to the digital is the liberation of radioelectrical spectrum, which can revert in several

advantages for the user, that should, in Jorge Ferraz Abreu's (Universidade of Aveiro) opinion, be clearly communicated to the population. Among these advantages there is the possibility of technological innovation, namely through the future implementation of new television services. This can include not only the referred improvement of image and sound quality but also the integration of interactive services.

It is also important to refer the possibility of inclusion of contents and interactive services that contemplate the particular needs of disabled people, making television more accessible.

Another possible argument to the adoption of DTT will be the unavoidable question of the costs that it involves to the user, in a sense that it will allow access to a quality of sound and image pretty much like the one offered by the pay-TV cable, satellite and IPTV services, with the single cost of a decoding device (that can eventually be subject to subsidization for specific groups of the population).

The fact that the switch-off is itself mandatory for the users that want to keep having access to free-to-air TV broadcast is a heavy argument for the adoption of DTT. This need to adopt a new TV broadcast system should be accompanied by several informational campaigns directed to the users.

There are, however, arguments against the adoption of DTT, considering that this will not itself consist of a set of obvious advantages for the user – namely, the fact that the number of accessible channels is the same in relation to the free-to-air analogue TV, and the fact that it is necessary to pay for a decoding box or new TV set to assure the transition. This question may dissuade the adoption of DTT.

1.2. Incentives to the adoption of DTT

As for the incentives that can motivate the more renitent Portuguese users into buying a decoding box or TV device with integrated DTT and subsequent adoption of DTT, there is a group of aspects that is important to underline.

Firstly, the advantage inherent to the better quality of sound and image available, was mentioned by 6 of the 16 stakeholders. This feature will of course be more valued in areas where the current analogical reception is weaker. The possibility of HD broadcasts is also attractive (2 out of 16 stakeholders mentioned this incentive), despite being valued only by the users whose TV device has a good resolution that allows to

fully enjoy the advantages of HD quality. Another advantage of DTT that is undoubtedly an incentive to its adoption is the one mentioned by one of the stakeholders: the fact that it allows portable inner reception, that is, it allows users to have access to TV with considerable quality of sound and image without the need for installing an exterior antenna, which is an advantage especially for ancient urban areas or historical locations.

The eventual creation of a 5th free-to-air channel was also considered a strong incentive to the adoption of DTT, for 3 out of 16 stakeholders, in so as to also allow a practical advantage in relation to the currently available free-to-air analogue TV. In relation to this is also the possibility of new functionalities and contents, namely of proximity (local or regional channels).

The most recurrently mentioned incentive to the adoption of DTT would be the low cost of the set-top-boxes (mentioned by 4 out of 16 stakeholders), compatible with the incomes of families, that would allow for better quality at a reasonable price. In this sense it is indicated (APD and SIC) the possibility of subsidizing the boxes - or even to distribute them free of cost – to the families in need.

According to APMD, the availability of more radioelectric spectrum, an advantage that comes from the transition of the analogue TV model to a digital one, should be explained to the population through informational campaigns, so that this factor too becomes an incentive to its adoption.

The question of the inevitability of the switch-off is also mentioned, in the sense that this can also be considered an incentive to the adoption of DTT, for the populations that will want to keep access to the free-to-air television broadcasts, as referred by ANACOM, APAP, DECO, PT, SIC and Sonaecom. Therefore, it is necessary that they understand fully that this adoption is the only possibility for them to gain access to that TV service. However, in the case of populations with low income and that detain TV devices that aren't prepared to have the new broadcast format, it is likely that the adoption of DTT will not in this circumstances be contemplated, which will imply, in case there is not an adjusted measure of subsidization, that these populations will opt to exclude themselves of the access to TV broadcasts.

1.3. Positions towards the subsidization of DTT

A question that inevitably appeared was the one concerning the subsidization of TV devices prepared to receive DTT and set-top boxes.

As for the population that could benefit from an eventual subsidization, the opinions diverge. Some institutions (APIT and RTP) indicate that this subsidization should be universal, in particular for the populations that will lose access to TV broadcast in case they don't adopt the new digital model: «It should be subsidized for all, in special those who don't have any other access to the 4 national channels, that is, those who will 'have to' switch, when none of the existing offer has persuaded them. To those, the incentive will have to be the free offer of the new service.» (APIT). This was also indicated as an ideal solution, but not practical in terms of very high costs it would involve. Therefore, the subsidization of the set-top-boxes was the most recurrently mentioned solution. This would contemplate for instances the subsidization (partial or full) by the DTT network operator of specific population groups in the process of acquiring the TV decoder and respective installation, namely those with bigger economical difficulties, social beneficiaries, citizens with special needs, etc. This solution is actually contemplated in the DTT operator license granted by the telecom regulator.

This measure was taken in other countries, such as Italy and U.S.A. On the other hand, there is a segment of the population – around 12 to 13% - that by their geographical location will only be able to continue receiving free-to-air TV via satellite. For those, DECO considered that the necessary equipment and installation should be made available freely.

As for the ways of effecting this subsidization, the possibilities stated by the stakeholders are the support of the State, of the DTT operator, financial institutions or through public-private partnerships. However, this question can raise problems in terms of the E.U. mechanisms, so it is necessary to comply to the established rules for that particular field (according to ZON's answer): «The legal principles of competition clearly define that there can be no favoring of operators in detriment of others. Each person should be held responsible by the acquisition of the necessary equipments. The transformations and technological alterations will occur and each person will have to adjust. Besides it is possible to find set-top boxes at very reasonable prices.» (ZON). It is precisely because of this question that some of the interviewed stakeholders refuse the

possibility of subsidization in the process of adoption of digital TV, since each person would be the responsible for choosing an operator, and therefore the costs inherent to that option, being the other reason mentioned the fact that there are decoding boxes available at low costs.

1.4. Barriers to the adoption of Digital TV

The question of the costs associated to the buying of a set-top box, or, in the cases in which it is necessary, to the substitution of a TV set, is mentioned again in what concerns the barriers or obstacles to the full adoption of digital TV. Particularly, due to the average price of the TV sets with integrated DTT and the decoding boxes, many families may not be able to have the necessary economical means to buy the equipments requires to the reception of free-to-air TV broadcast, in case there will be no support to the acquisition and installation of such devices. The issue of the costs is also aggravated by the current context of economical crisis – the instability is a strong factor that dissuades the investment of some families in set-top boxes that allow them to have access to DTT.

The very way the market operates is indicated (by Denicoli, Jorge Ferraz Abreu and Media Capital) as a potential barrier to the adoption of digital TV. According to Denicoli, PT (the DTT operator and also the major telecommunications company in Portugal) has also a strong positioning in the offer of cable TV services, as well as optical fiber and satellite, which means that, even if it is the DTT operator, it is not in its interest to provide for a strong DTT that constitutes a real competition to the services PT already makes available and that are way more lucrative for the company. Besides, the simple fact that there is an offer of TV services of another kind with more advantages for the consumers that can afford them is also a factor against the adoption of DTT by these population segments.

Likewise, the fact that the offer of free access channels through DTT is not only unattractive but also not complemented by a pay platform that allows for bigger offer, is also a barrier to its adoption, according to RTP.

The positioning of the governments in this issue was also referred by some stakeholders (Denicoli and RTP) as a barrier to the adoption of DTT, in a sense that it is

appointed to them an insufficient role in the regulation of both the market and the radioelectric spectrum that becomes available with this transition, and that is able to benefit the populations with more needs. On the other hand, the role that the regulatory entities took in not allowing the creation of a 5th channel is also pointed out as a potential barrier.

Also referred by one stakeholder – Media Capital – is the fact that the coverage of the DTT service is not sufficiently broad, which means some segments of the population will need a device that captures the signal via satellite, that will of course imply further costs.

Another factor that may constitute a barrier to the adoption of DTT is the very duration of the transition process from the analogical to the digital. In the Portuguese case, and according to RTP, there is a fear that it will be too short comparatively to other countries, not allowing the users enough time to adjust and get familiar to the process and all that it implies.

The socioeconomical characteristics of the users are an absolutely unavoidable factor in the adoption of DDTV, in the sense that a lower income and level of school frequency, as well as low technological literacy, will probably translate into a barrier to this adopting process. It is also considered that the elderly are also more susceptible of having these characteristics, while the younger population, because it tends to privilege the use of the internet to search for audiovisual contents, will prefer this resource to the television offer, which will also constitute a barrier to the adoption of DTT.

The informative campaigns, considered insufficient, are also singled out by 7 of the 16 stakeholders as a potential barrier. ERC suggested a direct approach to the consumers, a door to door campaign, to make the process more effective.

On the other hand, APIT mentioned that the single fact that adopting DTT implies an action from the consumer, or he or she will lose the access to free signal TV, is in itself a barrier.

1.5. 5th channel

When questioned about whether or not the existence of the 5th channel would or not be hurtful to the adoption of DTT by the Portuguese population, the opinions of the stakeholders are divided. Amongst those who admitted that it could be a strong incentive (PT, SIC, Sonaecom), the arguments revolve around the fact that is eventually would consist of further offer in channels associated to the switch-off from the analogical to the digital. The issue of the 5th channel appears frequently associated to the possibility of DTT providing for a package of paid channels, more accessible than the cable services and that would also consist in an alternative – even with a lesser offer probably – to the available signed TV services currently available. However, and as referred by one of the interviewed stakeholders (RTP), despite models that privileged paid offer in detriment to the free digital TV offer have failed in other countries, that had to later follow the reversed order, in Portugal it is the paid offer that is privileged, which means the model that is being followed is possible to fail.

To the group of that 6 stakeholders that consider that the existence of a 5th channel in free-to-air would not be relevant enough for the process of transition to digital TV, the argument is that the conditions to create such a channel would not be fulfilled, which would be the justification for ERC to suspend its development. On the other hand, another argument pointed out is that the creation of a 5th channel would imply more competition between the 3 existing operators, to which would eventually associated a decreasing of the quality of the contents.

1.6. Recommendations to an effective switch-off process

When questioned about what recommendations would be made so as to make the transition process from terrestrial analogical TV to DTT well succeeded, again the question of the 5th channel was mentioned by 5 of the 16 stakeholders as a pro-argument, eventually in HD, as well as the possibility of public channels that are now available only on paid network (RTPN and RTP Memória) to be made available in digital free-to-air network, or allowing SIC and TVI to be able to make use of more radioelectric spectrum so as their news channels could also be made freely available through DTT. Likewise, it was suggested by Denicoli the creation of regional or university channels that would be available freely, so as to constitute an obvious advantage.

In order to make more public channels available in free-to-air, RTP recommends that it is found a financial mechanism that allows its creation.

On the other hand, it is also recommended that DTT implies a betterment of the technical quality of the channels, such as making HD contents, or the possibility of including interactive contents and mobile TV. Also, the quality of the net coverage is a recommendation made by 2 stakeholders, PT and ZON.

Another recommendation that came from the interviews to the stakeholders was the one APIT made of including a pay DTT pack that would make it attractive in relation to the cable or optic fiber services.

The bigger presence of public and social institutions in the promotion, subsidization and subscription of DTT is one of the suggestions made by PT, in the sense that its position of visibility would allow them to constitute a valid platform for the adoption of this new TV system. It was also cited by Media Capital the example of Spain, in which the creation of an organism responsible for the communication, establishment of goals and guidance of projects allowed for the process of adoption of DTT to be more effective, faster and consolidated. Regarding the Spanish example, it is also worth mentioning the success of opting for an integrated offer in relation to the considerable amount of free services and paid services.

Unavoidable is the issue of the costs that the transition from analogical TV to the digital will imply for the consumer. Several recommendations were made in this sense, in particular in the current economical crisis situation and its consequences for the populations with more economical difficulties: one would be that this service would not imply any further costs, or making competitive prices for the set-top boxes, or even the subsidization of these devices, so as to this populations will not be excluded from the access of free-to-air TV signal.

As for the consumers, it is also recommended by ANACOM that they get the necessary devices for the switch-off in time, in order to avoid or resolve adequately situations of lack of stock or other necessary technical interventions in the reception system. Likewise, it is recommended that they search for information by their own initiative, namely through ANACOM. To this last question is recommended that there is an effective communication plan that informs the populations about the procedures that

need to take place, as well as the advantages associated with DTT and technical support, particularly to the people with low levels of technological literacy and people with special needs.

1.7. Recommendations towards the population in study

Specifically in what concerns the more vulnerable populations – the elderly, people with low technological literacy or people with special needs – the stakeholders gave several recommendations to make easier their process of transition from the analogical to the digital TV system. These include the necessity of informing these segments, through public information campaigns that are well structured and that show these populations what are the advantages and necessary procedures concerning the switch-off. Others suggest that a good solution to inform people would be to place outdoors, informative flyers – namely made available with the social security correspondence, for instances, and in local associations and institutions -, collaboration with TV personalities, face to face explanations by electrical devices salesmen or in the local post offices, or through the TV channels or even the family circle, call centers, etc.

On the other hand, in what concerns interfaces and TV contents for this specific population, the interviewed stakeholders underlined the necessity of presenting translated contents and audio-description, as well as adjusted devices. The contents should also be accessible and the necessary information be easily transmitted to people with special needs, in order for this TV service to be effectively inclusive. As ERC stated: «In what concerns DTT, these barriers have to be overcome from the moment the products are being produced, more so than in their exhibition and distribution. The production of the contents has to bear that in mind. As for the digital, it is urgent to study how can digital TV solve the problem of audio descriptions. This is a problem that has to be studied because audio descriptions is made available through networks that have radio band and that can though it develop these audio descriptions.» (ERC).

1.8. Evaluation of the communication campaigns during the switch-off process

Still in what concerns the communication on the process of switching-off, a considerable part of the interviewed people (5 out of 16, namely APD, DECO, SIC, Jorge Ferraz Abreu and ZON) evaluate it as residual or insufficient, considering that with the definitive switch-off date becoming nearer, still very few Portuguese are up to date with that process and the procedures that are inherent (such as buying a decoding box, eventual need to get a new TV set, etc.). DECO points out the confusion that many users make between DTT and other services such as cable TV, optical fiber, etc.

In this sense, 8 stakeholders (APAP, APED, APIT, Denicoli, ERC, Media Capital, Sonaecom, RTP) considered that the communication is startlingly inexistent, with the real danger of many people losing TV access simply because they lacked adequate information.

Another aspect that is relevant is the fact that the interviewed stakeholders consider the information made available by the websites of ANACOM and TDT inadequate, because of the simple fact that the population with the biggest informational necessities (precisely those who lack in technological literacy) will not probably use these means to search for information.

One of the stakeholders, ERC, suggests the necessity of implementation of a community-based proximity information campaign, in articulation with local entities, that explains effectively to people what they have to do to prepare themselves for the switch-off.

1.9. Digital Dividend

Another relevant question concerning the switch-off process is the way in which the digital dividend (the radioelectric spectrum available) that will be made available with this transition from the analogical to the digital. Among the possibilities referred by the stakeholders, it is included the bigger offer of services, especially in what concerns better quality of image and sound, new channels, HD or 3D contents.

The questions related to the interoperability and interconnection are equally mentioned by 2 stakeholders (Jorge Ferraz Abreu and PT), as aspects to be improved according to the European standards, when the radioelectrical spectrum is freed.

Another possibility 3 sources mentioned (Denicoli, PT and ZON) is that this digital dividend be used for high speed internet connections in broadband, making it more accessible, and to mobile TV services. There is also the opinion (SIC) that this spectrum should be reserved to the radio diffusion of TV and radio.

As for ERC, the opinion of this entity is that this is a delicate matter that demands planning and therefore it must remain on the open at the moment: «It is necessary to think ahead. Today we all talk about IPTV, we all talk about broadband... but how will it be in 20 years? How will it be in 25 years? Will we be thinking in another kind of distribution? We must take in account a series of factors and above all not compromise the future already.» (ERC).

1.10. Perceptions towards government strategies

One of the questions that was important to mention was the way in which the interviewed stakeholders defined the government's strategies towards the process of transition from the analogical TV to the digital. Among those who considered it adequate (ANACOM), the arguments revolved around the timing of the preparation of the transition, all adequate, or the fact that the adopted strategies were according the ones adopted in other E.U. countries. However, even among those who have favorable opinion on the measures that have been taken by governments, it stands out the necessity to consolidate efforts to the implementation of DTT in Portugal, through partnerships for the subsidizing of decoding boxes to the population in need, or through informational campaigns that prepare people for all the aspects inherent to this change.

Other opinions (APED, Jorge Ferraz Abreu, SIC and Sonaecom) state that the governmental measures have had long stops, going backs, stepping forwards, change of strategies, etc., due to the difficulty in managing so many factors in a whole that is very complex and in a context of economical crisis. On the other hand, some of the stakeholders considered that the governments strategies in the process of switching-off was diffuse, indecisive or even inexistent, as a consequence not only of the changes

inside the governments but also of the difficulty in managing the performance of several organizations and institutions.

Regarding specific options, one of the opinions (ZON) stated that the governmental strategy should have chosen DTH (satellite TV), as there was already available a supply chain and it was eventually a cheaper option: «However, maybe it would have been useful the adoption of a satellite solution, as there were already 2 suppliers that were capable of making the service available in the whole of the national territory, probably with lesser costs for the country (in terms of investment in imported technology) and even with less costs of transportation for the TV channels, currently available in hertzian transmission.» (ZON).

Another opinion, Denicoli's, reflects negatively the fact that PT was the company chosen as operator of the service of free DTT, seeing in this a situation of favoritism: «The government privatized the implementation of digital TV and handed it to PT, where it keeps its 'golden shares', condemned by the European Committee, and that allow a strong political pressure over the group. There was a clear situation of favoritism to PT, since the launching of the public contest of DTT. Sonaecom even denounced that officially. But this favoritism was always very subtle.» (Denicoli).

The time of governmental actuation concerning the several parts of this change was also a factor the interviewed stakeholders mentioned (DECO, ERC and RTP), as a negative one: some consider that the government should have been quicker in making the decisions, and sharper the phasing of the process, both in the process of technological migration and in the process of informing the people: «The task of migrating to the DTT in our country became more complicated with the late start of the digital platform. Other countries did it pretty sooner (like Germany in 2002, Holland in 2003, the U.K. in 1998), allowing therefore a broad period of simultaneously (where both the analogical and the digital coexisted).» (DECO); «After this long stop, to which the evolution of PT is not without consequence, a tough economical context followed. Therefore, the process has been complex, involving a set of technical, economical and social aspects that are not easy to manage. If you ask me if I think the process was a big success, I'd have to say no. If you ask me whether I could have known how to do it better, I'd say that maybe, afterwards, it's easy to say I could.» (RTP).

Some of the recommendations that the stakeholders mentioned (in particular Media Capital) towards the way the governments acted in this process of technological migration are to be noted: a) to privilege the freed radioelectric spectrum to reinforce the technical applications already available; b) to take specific measures of accessibility for the citizens with special needs; c) to reserve spectrum for the production of programs and special events; d) to make sure the state assumes, at least partially, the inherent costs to the transition; e) to make sure that the current programs can be transmitted in HD and not exclude the possibility of becoming available in 3D; f) to assure the regulation of the competent entities; g) to assure the recommendations and norms within E.U.

1.11. Roles of the main stakeholders

In a process of transition from an analogical TV structure to a digital one, in which one of the challenges is to conjugate the performance and objectives of the several entities involved, we tried to understand what perception did the stakeholders have in what concern the role each of the main parts should have, namely RTP as the public television service, ANACOM as the regulatory institution and PT as operator in the DTT network.

1.11.1. RTP

RTP, as the public television provider, is taken into account by several of the interviewed stakeholders (APED, APIT and Denicoli) as having the main responsibility in this transition. One of the main arguments is that the public operator can have an aggregation part among the several intervenients, as it is in a privileged position to launch the DTT service, especially in what concerns the information about that process: «The public operators are having, in all Europe, a crucial part in the adhesion of people to DTT. In UK and Spain – the first two countries to implement DTT in Europe – initially the DTT failed and they re-launched the services in a structured way, giving bigger emphasis to public channels, such as BBC and TVE. Many other European countries, such as Italy and France, followed the same path and made these public companies stronger, so that they could impulse digital TV. Portugal should follow the

same directions, as it seems to have been working out fine. But there are no moves in that direction.» (Denicoli).

It is also worth mentioning that 8 opinions state the part of RTP in this transition is mainly informative (APAP, APIT, DECO, ERC, Media Capital, PT, Sonaecom, ZON), that is, that it should bring out the necessary means to the transition, especially for the population with low literacy levels, as well as inform about the advantages and technicalities of the process, through broadcast, shows, information programs, etc.

Promoting the transition was another role 5 stakeholders mentioned as of responsibility of RTP (ANACOM, APAP, APIT, DECO and RTP), contributing with a positive input to the current change of TV systems and giving the users enough and adequate information for them to be able to be prepared for the 2012 switch-off.

Another role frequently assumed to be of RTP's responsibility (by APD, Sonaecom and Jorge Ferraz Abreu) is that of guarantee the quality of television contents, making sure it is an effectively public TV service, and possibly with a 5th channel, that would become a factor of further interest for DTT. It was also mentioned the role of making the contents fully accessible to people with special needs.

The issue of the contents was mentioned by RTP itself, in the sense that it assumes as its main role to assure the offer of non-linear products, such as the promotion of the Portuguese language in cultural products developed not only in TV and internet but also in new products (including 3D), when the switch-off comes, in a perspective of complement and integrate with other forms of television broadcast that are not DTT, or internet. It also highlights the possibility of passing the previous contents from magnetic tape to its recording in servers. There is, in fact, a project of RTP in that direction: «The challenge of RTP is huge and it should assume as a priority the challenge of proceeding to the transition of the recordings of contents from magnetic tape to a pioneer method that records those contents in servers. RTP is developing a project that organizes the use of the new technologies in this field and it will continue to do so.» (RTP).

Another opinion (SIC) refers that the role of RTP should not be more important than the one of other TV operators.

1.11.2. ANACOM

In what concerns the role of ANACOM in the process of transition from the analogical to the digital TV, it is referred by the stakeholders (APAP and RTP) that it is to assure the access to TV in free-to-air to all the users, so that no one is excluded.

Therefore, it is suggested that ANACOM assumes the role of informing the population, simultaneously with other institutions, promoting the transition through debates, public information sessions, etc. Another aspect that ANACOM itself highlighted is the creation of coverage conditions – assuring therefore its quality – that allows all the population to have access to TV in free-to-air.

On the other hand, it is referred by 12 in 16 stakeholders that it's its responsibility to articulate the several parts, in coordinating the transversal activities to the transition process. It's to the regulatory role of ANACOM that the interviewed stakeholders give more importance, as well as to supervise the markets and the activities inherent to the process, so as to assure its transparency. It is also mentioned the function of make recommendations to governments in that sense, assuming a role of intermediate between governments and the several institutions involved: «It should promote the regulation in an impartial way, guaranteeing to the citizens a fair and effective management of the radioelectric spectrum, which is a common good to all the Portuguese. The role of ANACOM is mainly technical and it is important that the regulator doesn't subdue to political pressure.» (Denicoli).

One particular aspect that was mentioned by one of the interviewed (DECO) in which ANACOM should intercede was in the specific case of the subsidization of decoding boxes for the populations in need: «The matter of the subsidization of the decoding boxes, as stipulated in the license of use, is still a secret. ANACOM has responsibilities at this level, by not taking measures that force PT to divulge them in useful time.» (DECO).

On the other hand, it also was questioned the process by which PT established as the DTT operator, which raised doubt to one of the stakeholders (Denicoli), namely whether ANACOM had had the most adequate response to that situation: «Currently, ANACOM has been a disappointment and allowing the existence of inexplicable blanks, such as the decision by ANACOM of refunding PT with the caution related to

the contest for paid DTT, without giving much explanations for its position.» (Denicoli). A third question raised (SIC) was related to the launching of paid DTT, which according one of the stakeholders should be of ANACOM's responsibility.

Still worth mentioning is the matter concerning the management of the radioelectric spectrum, which will be, according to some of the interviewed (ANACOM, Jorge Ferraz Abreu, Denicoli, RTP, SIC, Sonaecom and ZON), of ANACOM's competence, allowing space for the development of the future audiovisual market, through careful management of the interests of the several operators: «As the entity responsible for the management and attribution of spectrum, it is its responsibility to guarantee the effective and efficient usage of spectrum and supervise the abidance of the conditions under which frequencies are attributed.» (Sonaecom). Also the matter of the quality of services was approached (RTP and ADP), being the responsibility of its regulation, according to these stakeholders, of ANACOM.

1.11.3. PT

The third part in the process of transition of analogical to digital TV was PT, as operator of the free-to-air DTT network. Some stakeholders (ERC, Media Capital, RTP, Sonaecom and ZON) refer that the role of PT is to follow the obligations of the public bid through which it became the operator of the DTT network, namely by ensuring the network coverage, making it accessible to the whole of the population and to safeguard the interests of citizens, aspect in which both the regulatory entities and governments must have an active role: «The role of PT, in my point of view, is the one that is written in the regulations of the contest to which it submitted a proposal that won. That is the role, it is very well described in its obligations. As for the fact that PT has itself IPTV and other type of distribution, the government must be very attentive, and the regulator must also be aware so that the citizen – and I'm not saying the consumer – is not in the least form hindered or pushed to this or that technology. There must be neutrality. We must provide a free and universal service, and it is essential to guarantee that that service is free and universal. I think PT will certainly be able to separate its functions.» (ERC).

There is a recommendation that comes from this matter, that PT must separate the fact that it is the operator of DTT and also the detainer of an ADSL and optic fiber

service, which could conduce to situations of unfair competition, so its performance must be closely regulated by the competent entities, namely ANACOM.

Another referred aspect (SIC, PT, DECO, APIT, APAP and ANACOM) as being of the responsibility of PT is that of bring forth information that makes the population ready for the switch-off, making communication plans, to which a sum is made available, according to the terms of the public bid. Also important as referred by the stakeholders (APD, Denicoli, Jorge Ferraz Abreu and PT) is that PT must ensure the good quality of the television service it provides, with good network capacity and signal, so as to allow the percentage of the population that will not be able to have access to DTT by herztian transmission (12,8%) to not increase, and to have equal access to DTT without further costs.

RTP also states that PT has the responsibility to allow for the future technological evolution, allowing eventually new forms of diffusion and new potentialities – such as HD, for instances: «And it must also have a role in the evolution of technology and possible evolution of the network, in such a way that the same network is able to, in the future, evolve to DVB-T2, and other forms of diffusion, HD, etc.» (RTP).

Finally, another referred aspect (by ANACOM, APIT, DECO, RTP and SIC) as responsibility of PT is that of enabling the subsidization of decoding devices to the populations in most need, ensuring that the access to free-to-air TV is transversal to the whole of the population.

Final Note

After the data collected in this second phase of the investigation, we highlight a set of aspects that are particularly relevant to the process of transition from the analogical TV to digital. As arguments for it's adoption, the most important are the better quality of image and sound, as well as the possibility of broadcast in HD and 3D formats or the creation of new interactive contents, the eventual existence of a 5th channel or more, the liberation of radioelectric spectrum and the relatively low cost of the transition (which is the price of a set-top box). These arguments translate also in incentives to the adoption of this new technology of distribution of TV in free-to-air.

The matter of the subsidization is also unavoidable. In this field the opinions tend to divide – some state that it should be universal, guaranteeing that all the population has access to DDTV; others that it should be applied to specific segments, with economical needs or accessibility issues. Unfavorable opinions revolve around arguments such as the free choice of the operator by the user, or the fact that the market is provided with low cost decoding devices. As for the favorable opinions, the ways by which this subsidization should take place include state contribution, operator, public-private partnerships and banking institutions.

The most common announced barriers to the DTT are the inherent costs of buying the decoding box or the TV set with integrated DTT, particularly to the populations with low technological literacy levels and with economical needs, the functioning of the markets, the unappealing offer of channels and the fact that it is not complemented by a paid platform, the behavior of the governments (namely in regulating the markets and the radioelectric spectrum available) and the regulatory entities (which resulted in the non-existence of a 5th channel).

Considering the 5th channel, some of the interviewed stakeholders considered it a strong incentive to the adoption of DTT, as it is an appealing factor, while most of the answers stated that it is irrelevant in that sense.

The stakeholders left some recommendations to an effective process of transition of analogical TV to DTT. These include a bigger diversity of offer, namely technical quality (HD, 3D, interactivity, quality of coverage) and quantity of channels (5th channel, more free public channels, eventually local or university channels); the main role of public entities and social associations in the promotion, subsidization and subscription of DTT; control of costs, namely through subsidization; timely preparation of the population to the transition, which assumes an effective communication plan.

As for the population that might be more vulnerable throughout this process – elderly, people with low income and literacy levels, as well as people with special needs – are recommended more effective forms of informing them, as well as making the television contents more adequate to their specific needs in terms of accessibility.

When questioned about the way they evaluate the informative campaigns, many of the stakeholders considered it residual or insufficient, as the population remains

generally uninformed and unprepared. Half the interviews collected indicate that it is alarmingly inexistent or inadequate, once that being available on the internet is not enough to reach the population segments with low technological literacy (note: the fieldwork for this study took place between October 2010 and January 2011; the first information campaign about the switch-off took off in March 2011). In this sense, one of the stakeholders suggests a proximity campaign with face-to-face interaction, in cooperation with local entities.

The opinions concerning the digital dividend are diverse. The stakeholders indicate that it can serve for better offer of services or better interoperability and interconnection, broadband and faster internet, radio diffusion of TV and radio. One opinion also highlights that it must remain in the open, so as to not compromise the future in what concerns the technological possibilities.

The evaluation of the governmental strategies is by some considered positive (timely and according to E.U. directives), while at the same time the majority of the stakeholders considers it to be unsatisfactory, due to the complexity of the factors and actors involved, inefficacy of the information campaign, inadequate timing for preparing the transition, process of choice of the operator or the choice of DTT in detriment of TV via satellite.

The role of RTP in this process is by many of the interviewed seen as prominent: to ensure the synergy between all the actors involved, to inform, promote the transition, to ensure the quality and accessibility of the television contents. As for ANACOM, the interviewed consider that it's its role to ensure full access to DTT in free-to-air to all of the population, as well as to inform it, create coverage conditions, articulate the whole of the parts in the process, to subsidize decoding boxes and to manage the radioelectric spectrum. In what concerns the role of the operator, PT, this would be of fulfilling the contractual obligations, to ensure the quality of the service, to allow for the future technological evolution to take place and to participate in the subsidization of decoding box sets.

Concluding, a general portrait of these stakeholders' opinions leads us to highlight three areas of action so that the successful transition from analogue terrestrial TV to digital may be a reality for all the Portuguese.

Firstly, the reinforcement of the attractiveness of DTT, increasing the number of channels and useful services, as the opening of transmissions to the HD and 3D formats. Currently, the advantages of DTT are not significant in contrast to what has generally happened in all the countries which have passed for the same process. In Portugal, as Sérgio Denicoli pointed, there's a lack of elements that lead the viewer to want to migrate voluntarily for DTT: «In Spain, for example, DTT brought over 20 free access channels. That is, citizens invested in the purchase of a TV with digital tuner or a set-top box because they knew they would have a differentiated schedule».

The promotion of communication campaigns more informative and enlightening is equally important, warding off the real danger of many people losing TV access simply because they lacked adequate information.

Finally, and considering the context of economic crisis that Portugal is crossing, the importance of strengthening the supports towards the inherent costs of this mandatory transition is further highlighted, either through the subsidization of the set-top boxes, either by making competitive prices for these devices, so that the populations with more economical difficulties are not excluded from the access of free-to-air TV signal.

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