

Digital Radio in Europe

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- *Although it does not enjoy a great deal of popularity in Spain, digital radio is a reality on the European radio market. The concept of digital radio is not limited to introducing the DAB (Digital Audio Broadcasting) system developed by Europe but also includes other systems of production, distribution and reception. Digital radio uses the Eureka 147 DAB system as well as cable, terrestrial digital television and satellite TV, the generation of UMTS mobile telephony, satellite and Internet digital-radio systems, and all without abandoning the traditional supports of FM, MW and SW, which are already testing signal-digitalisation systems. Far from being a strictly technical question limited to signal quality, digital radio is diversifying and increasing the number of distribution channels (including new content other than sound) and creating different ways to dialogue with audiences. It is thus changing the traditional broadcasting model and throwing up major challenges in the field of content and radio-company management.*

Introduction

At the State level, digital radio does not enjoy a great deal of popularity among either radio journalists or stations. Rather, there are major obstacles to recognising it as the price radio has to pay to remain on the new competitive media market that features the convergence of all digital

supports. The need to uphold market balance, even though this concept has often been questioned by audiences, has meant that traditional radio stations have failed to throw their weight decisively behind digital conversion.

The very thing that was once a byword for progress and modernity now appears to be a utopia of complicated execution in Spain. However, digital radio on other markets is already an indisputable reality. Furthermore, it does not stop with the introduction of the DAB system developed by Europe but includes other systems of production, distribution and reception. Broadly speaking, we could say that we are witnessing the configuration of a new concept of radio. Whoever fails to recognise this now will have serious difficulties in meeting the quality, new-service and interactivity demands of an audience which in ten years from now will have effortlessly incorporated the digital era into their daily consumption routines.

Radio in the New Digital Environment

To understand the scope of the technological, cultural and social convergence we are currently experiencing, it is important to point out that, in a digital environment, radio radically changes regular communication conditions. Firstly, the possibilities for broadcasting using supports other than electromagnetic ones are multiplied. Radio is also beginning to design and manage content that includes text, graphics, images and interaction possibilities. At the same time, it is establishing different forms of production, dissemination, access and consumption of messages. Therefore, when we talk about digital radio we are referring to a radio that is taking on the peculiarities of digital systems and subsequently diversifying and increasing the number of distribution channels (including new content other than

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sound) and creating different ways to dialogue with audiences. Let's look at what it all means.

In the new digital environment, distribution supports multiply and are no longer the scarce resource that justified the birth and consolidation of public broadcasting systems in Europe. A process of complementarity and diversity of supports occurs which makes it possible to use channels other than the electromagnetic spectrum, which has been the regular one to date. Digital radio uses the Eureka 147 DAB (Digital Audio Broadcasting) system as well as cable, terrestrial and satellite digital television, the generation of UMTS mobile telephony and Internet and satellite-based digital radio. All this, without abandoning the traditional supports, which are exploring ways to digitalise FM signals through the IBOC (In Band On Channel) system and AM (Amplitude Modulation) and SW (Short Wave) through the DRM (Digital Radio Mondiale) system.

With regard to language, another feature of a digital environment is that it combines different communicative dimensions. Radio that speaks only with sound becomes a multimedia support. It is "radio that reads and sees", as other authors have commented. Other services and sounds apart from radio in the traditional sense of the term appear. Production processes are modified and the possibilities of distributing them are multiplied. Digital radio is no longer sound radio and is integrated with other, complementary languages. It is integrated in a new modality of exhibiting its programmes different to the *here* and *now* of traditional radio and at the same time opens the door to new forms of narration in which it is complemented with other content.

The traditional communication model of radio is also modified. A non-mass, specialised and personalised model is established with different levels of interactivity on demand, in which a diachronic and successive reading becomes possible. We could say that the way of making and consuming radio is changing. The Internet is the laboratory where experiments are made and possibilities developed today. However, technological development means that within a decade this will be possible on other supports.

This new environment, characterised by a diversity of supports and content and the implementation of a new model for consuming or listening to the radio changes the dynamics of frequency management, production rates and content management, strategies for capturing new listeners

and the powers and alliances established among media organisations. To date, traditional media divided up a market, while now they come together on identical stages and are forced to diversify their core business to survive.

The Current Situation of DAB Radio

The process of digitalising radio's electromagnetic support does not begin and end with the development of the European system known as Eureka 147 DAB. However, DAB is the most revolutionary and complete system in the attempt to digitalise traditional radio and is considered the first big technological change in radio since the appearance of FM, stereophony and transistors.

Europe has been the main promoter of the DAB system, which began in 1986 with the support of the European Broadcasting Union (EBU). The aim was to develop a way to broadcast radio signals that would make it possible to prevent interference from MW and FM bands, extend transmission possibilities in a saturated spectrum and improve signal quality and stability, particularly in terms of mobile reception.

The period of technical development of the new system was completed in 1995 when the European Telecommunications Standard Institute (ETSI) adopted the DAB system as the only European standard¹. Technical efforts since 1995 have focused on obtaining accessibly priced and easy-to-use receivers and the integration of DAB with other multimedia applications and digital supports. A number of technical adaptations aimed at converging with the MP2 and MP3 digital-compression systems and the reception interfaces of digital television and personal computers have been made. In April 2004, the company Microsoft Corp. announced it was joining the WorldDAB Forum to speed along the development of new services. DAB is also expected to integrate with mobile telephony. To that end, the WorldDAB Forum has begun to take part in telecommunications congresses and fairs where developments in telephony services are discussed and presented.

DAB has a number of conditions that are particularly attractive to European radio, which, because of its geography, extension and location, is suffering from a saturated spectrum and has many difficulties with regard to

mobile broadcasts. Compared to traditional MW and FM systems, DAB offers a technically high-quality signal, reception free from interferences, mobile and portable reception, improved use of the spectrum, compatibility in the use of terrestrial and satellite systems, use of a lower-strength transmission, increased number of programmes, simple receivers compatible with other digital systems and the ability to disseminate images, graphics, text and, very soon, video services as well as services added to the principal programme.

Because it includes complementary and value-added services, DAB digital radio breaks with models based on station programming to give rise to programming techniques by channels. To the principal programme we can add adjacent channels, not just with data, images and graphics, but also audio, so that it is possible to offer other services, including listening to live broadcasts of parliamentary debates, showing all the messages that listeners leave on answering machines, accessing complete versions of interviews, etc.

Despite these advantages, which ensure DAB a speedy success, and the fact the many countries have adopted it as their technical standard, the implementation process has been laborious and complicated, basically for three reasons. Firstly, it requires awarding new Band III (174 to 274 MHz) and L-band (470 to 3100 MHz) licences, which means that some countries have had to readjust the distribution of a part of the spectrum that was previously being used for other services. Furthermore, the first licences awarded by the International Telecommunications Union (ITU) were not extensive enough, particularly for European countries with a long history of commercial radio such as Spain. Secondly, national governments have needlessly delayed the timetable for the introduction of DAB and have been excessively conservative when it comes to planning the regulatory framework, thus discouraging broadcasters from starting on the road towards digitalisation. Thirdly, once the debate about the complementarity of traditional systems and DAB had drawn to a close, the price reduction for the new receivers the system requires and the creation of a real market have still to be provided with a successful strategy.

By the mid-1990s, Europe was establishing forums to develop digital radio in an attempt to address these problems and promote the system in the different countries.

Although they had different structures and names, the goals and functions were similar: to follow DAB's evolution on the international scale, generate a favourable opinion among future users, define the new services to provide, obtain more radioelectric resources and define the framework for introducing DAB in each country. Germany, France and the United Kingdom were the first to create these forums and working groups, followed by Italy, Spain and the other European countries. Meanwhile, the European Broadcasting Union promoted the establishment of the WorldDAB Forum (www.worlddab.org), which initially grouped together European countries only under the title EuroDAB Forum. The name was changed to WorldDAB in 1997 and brought together all the sectors interested in the development and implementation of DAB, from governments through to broadcasters and transmitter and receiver manufacturers. The WorldDAB Forum facilitates the exchange of information, the organisation of congresses, the preparation of technical reports and market surveys, the promotion of the system, the development of new services and research into ways that can make it possible to offer flexible and inexpensive receivers.

In the past decade, nearly all the European countries have established their regulatory frameworks, awarded frequencies to public and private broadcasters and planned how to establish transmission networks. Figures from the WorldDAB Forum suggest that DAB has a potential audience of 300 million people able to receive around 600 radio stations today, many of which simulcast analogue programming.

The struggle to obtain competitive coverage has begun, although it has still to be concluded. DAB now has a coverage of 80% in the United Kingdom and in Germany it exceeds 70%. The figure for Canada is 35% and Australia introduced the system in December 2003. Meanwhile, countries such as France and Spain have only managed to achieve a theoretical coverage of 25% and 50% respectively, as many of the transmitters installed are either inactive or transmit with a data and strength capacity greatly inferior to the one stipulated and desired. That is why the debate – which, in Spain at least, should focus exclusively on the availability of accessibly priced receivers for the audience and the development of new content and services – is currently facing a crisis of trust in the system itself.

Within Europe, the country that has most decisively and continuously supported the future of digital radio is the United Kingdom. The BBC began experimental broadcasts in 1997 and one year later the Radio Authority awarded seven DAB multiplexes for new broadcasters in the frequency spectrum ranging from 217.5 to 230 MHz. In a move aimed at stimulating this initial distribution, the Radio Authority agreed that DAB licences would be granted for 12 years, automatically renewable to 24. At the same time, broadcasters who already had radioelectric frequencies on the AM and FM bands would have licences granted when they requested a digital radio frequency.

Because the private radio groups in the United Kingdom were still consolidating after the break up of the public radio monopoly, it was not hard to reach the consensus needed for the distribution of frequency blocks. One multiplex was awarded to national BBC programmes and another to Digital One, the multiplex that brings together the national commercial stations. The five remaining blocks were reserved for public and private regional and local broadcasters that had properly completed the implementation schedule.

With regard to programming, public radio began with transmitting its national channels: the youth station BBC 1, the popular BBC 2, the classical and cultural station BBC 3, the full-service BBC 4 and the news/sports station BBC 5 Live. Today, as well as the five traditional stations and the new format Five Life Sports Extra, the BBC has used DAB to launch a further three stations: BBC 1XTRA, specialising in black music; BBC 6 Music, which plays pop from the past 30 years; and BBC 7, a station that specialises in entertainment, comedy, drama, literature and children's programmes. It also uses DAB and the Internet to provide access to the complete programming of the BBC World Service and British Asian Network.

For its part, Digital One includes the UK's biggest private radio group, GWR and the terrestrial network operator, NTL. It first began DAB broadcasts in November 1999. Initially they simply simulcast the content of the national networks Classic FM, Virgin and Talk Radio, but soon went on to develop DAB content. First was the station The Core, with a CHR (Contemporary Hits Radio) format for teenagers and the under 25s, followed by Planet Rock, specialising in classic rock music. The next cab off the rank was The Mix,

an AC (Adult Contemporary) format of Live Digital Radio, followed by the specialised culture station Oneworld, the EL (Easy Listening) format of Prime Time Radio, the ITN all-news station, Talk Sport and the economic and financial news station Bloomberg Talk Money. In the past year it has added the specialist stations Student Broadcast Networks, Passion For London, ChoiceFM and Purple Radio².

As the UK case has shown, both public and private radio stations have supported the development of new content for digital radio, seeking specialisation in talk issues and music styles. Services and information and graphics stations have not enjoyed the same development. In these cases, they only include additional programming information (station ID, scheduling information, etc.) and traffic and weather information for drivers. The BBC's data service station is called BBC Vision Radio, while Digital One has an experimental interactive service called Digizone, which includes games, news headlines and information about the music stations.

From the outset, British broadcasters were aware that the real battle in implementing the system would be to win listeners over to digital radio. It tackled this challenge with an effective marketing plan that sped up access and availability to the technology. The Digital Radio Development Bureau (DRDB) was established in March 2001 whereby national and local public and private radio stations could join forces to meet this goal. The publicity campaign and sale of DAB receivers at the accessible price of £99 carried out in December the same year was very successful. It was the first concrete industry initiative to popularise the new system and showed receiver manufacturers that the market was interested in DAB and its value-added products if the price of receivers could be brought down considerably. The campaign was first carried out in London, extended throughout 2002 to the main UK cities with similar success and repeated during the last Christmas period. The promotional activity included the regular realisation of competitions with prizes that included a DAB receiver, the publication of listener magazines, the development of EPGs (Electronic Programme Guides), which until the end of 2004 arrived over the DAB signal, and the maintenance of a database that systematised listening habits and regular email consultations from over 5,000 listeners.

In March 2004, the DRDB had sales figures of half a million DAB receivers and estimated they would double by

the end of the year. In fact, the organisation that researches radio audiences, RAJAR (Radio Joint Audience Research), has included audience figures from DAB broadcasters since the first quarter of 2003. Although the audience share it won in the last quarter of 2003 was only slightly over 1%, it is still an encouraging figure bearing in mind the number of receivers available at the time.

Germany, together with France, was the main promoter of DAB during the research period. Digital radio transmission began in 1999 and today includes more than 150 broadcasters across the country. 40% of them offer exclusive content for the new support, while the remaining 60% simulcast analogue programmes. The planning of the DAB spectrum is up to each federal state and the granting of licences carried out to date has allowed the appearance of new broadcasters. Since May 2001, Initiative Marketing Digital Radio (IMDR) has promoted the system by procuring to combine forces with industry, government and broadcasters. It also assesses the viability of an analogue switch-off that will force all the radio stations to digitalise within 10 years.

In Spain, the first pilot experiments in DAB began in 1998. The National Digital Broadcasting Technical Plan, which awarded the first national licences, was established a year later. The six multiplexes available were distributed as follows: three national multiplexes to the public and private stations with a total of 18 programmes, two multiplexes for autonomous-community and regional broadcasters and one for local broadcasters. Coverage currently stands at around 50%, according to the national network operator Retevisión and the operators in the autonomous communities. However, many of the services are not operative, do not transmit with the data capacity or strength awarded and the adjustments of data stations – where they exist – are confusing and permanent. Content is fundamentally simulcasts from the analogue broadcasters. Radio Nacional de España simulcasts the four national stations and the Radio Exterior service across Europe. The private stations Onda Cero Radio, SER, COPE, Radio España and Intereconomía do the same. The remaining licence holders, El Mundo, Radio Marca, Onda Rambla-Planeta, the Godó group (which broadcasts M80 Digital), Quiero Radio, Punto Radio de Prensa Española and the Vocento group include music broadcasts and the odd specific content developed

for other digital supports, in particular the Internet and the postponed and controversial digital terrestrial television.

The situation in the autonomous communities is pretty much the same. Catalonia, the Basque Country and Galicia have led the charge with regards DAB broadcasters. Catalonia has awarded a total of 48 local and provincial licences to date and carried out a number of informational and promotional campaigns about DAB, in which it has given away 500 receivers.

Although the Forum for the Development of Digital Radio was established in April 1997 and was very active during the period of technical experimentation, it quickly lost its way in promoting the system, bringing down the price of receivers and developing new content. This means that the situation in Spain is slightly more pessimistic, at least among the broadcasters of the traditional stations, who are not disposed to break the current balance of national and local markets that are still returning positive results.

National timetables aside, in general terms we can say that the introduction of DAB digital radio is now facing three challenges: consolidating real coverage, extending the content and service supply and capturing audiences. It will only be possible to reach stable goals if the steps followed form part of an overall strategy that facilitates the integration of all the digital supports of the new radio being developed.

Other Systems of Digital Radio: the Digitalisation of MW and FM and Satellite Digital Radio

The digital radio environment does not end with the introduction of DAB. In the past decade, technical efforts have been made to digitalise MW, SW and FM in the short term and to make the most of the signal distribution of satellite systems.

In 1997, the United States authorised two nation-wide S-DAB (satellite digital-radio) licences, i.e., XM Radio and Sirius Radio. They have a national coverage and work on a subscription basis, offering over 200 mainly music stations. However, they also include news and sports stations in virtue of the redistribution agreements they established with USA Today, the BBC World Service, PBS, Bloomberg News, CNN News, The Weather Channel, etc.

Because they were pay stations, the added value offered

to subscribers (for an average price of \$10-14/month) consisted of maintaining updated music lists, the use of DJs with a very good knowledge of the music genres they presented, and not having advertising (except for sponsorship, the main source of funding)³.

The authorisation of these S-DAB frequencies with a national coverage across the US was of an experimental nature. Depending on how market acceptance went, the FCC (Federal Communications Commission) hoped to obtain data on the changes that would be involved with authorising a greater number of digital-radio frequencies of a national coverage on a basically local market.

With regard to terrestrial digital radio, in early 2003 the FCC authorised the adoption of the IBOC (In Band On Channel) system to digitalise the current FM and AM signal carriers. Under the names HD Radio and AM IBOC, the company iBiquity Digital Corporation developed a system of digital radio for the traditional electromagnetic spectrum without modifying consumption habits, market conditions or current content. These conditions were very advantageous to receiver manufacturers, broadcasters and audiences, who did not have to change frequencies or spend a lot of money updating existing technology. The system included the development of associated text and data services that would make it possible to identify new listener requirements. Although it still needs some technical adjustments relating to protecting the signal from interference from other transmitters, more than 100 broadcasters have adopted the system on an experimental basis in the US.

DRM (Digital Radio Mondiale) was developed in 1998 to work on the digitalisation of SW and MW. Five years later, the group had tested and standardised a digital-radio system for these frequency bands. A group of 80 broadcasters, network operators, receiver and transmitter manufacturers and the governments from 27 countries took part in the consortium. The system includes the development of data and text channels and can be received on fixed, mobile, portable and PC receivers. It was approved by the ETSI in September 2001 and various tests and demonstrations have been made at international forums. The official industry presentation took place in June 2003. In August that year, the WorldDAB Forum and the DRM consortium announced they would work together on developing receivers and services common to the two

systems, as they had arrived at the conclusion that they were complementary technologies. By January 2004, a total of 60 stations had begun to run test broadcasts with the system. Although a number of receiver prototypes have been developed, neither competitive market prices nor equipment that will also be compatible with other digital systems are expected before the end of 2005.

The Internet as a Content and Interactive Services Laboratory

Although the sphere for developing radio technology has always been the electromagnetic spectrum, radio cannot reject other digital supports and media, as they all tend to converge in the common environment described above.

As a starting point, the Internet cannot be considered a direct competitor of either traditional radio or DAB digital radio. The Internet is a new support that facilitates the digital integration of radio and the supply of new services. When people talk about online radio today, it is important to understand that it concerns a new form of communication rather than just a new support. The principal and traditional programme broadcast in real time is complemented online with other, new audio services, called side channels, with a new way of showing the principal channel and different ways of narrating sound. It is clear that online radio is a concept that transcends traditional radio. It is traditional radio as a basic concept of sound communication and a great many added values that can be accessed on the Internet, on DAB and on a range of digital supports.

Radio is no longer defined by its basic technical support or the technology it is built on, and imposes a concept based on content and functions: radio is not defined by technique but rather by supply.

Even if the Internet is not the only manifestation of digital radio and its features are not exclusive, it does have a number of significant advantages over radio. Firstly, it has a global scope that makes it possible to access international coverage without additional technical infrastructure. Furthermore, the process of implementation on the Internet and online radio have been much faster than in the other digital supports. The Internet modified radio's traditional communication model and made it personal, interactive and

on-demand, allowing a new packaging of products no longer limited to sound but which can be understood as added services of data, images, graphics and videos.

From the point of view of the message, the Internet also makes it possible to go beyond the concept of the *volatility* of the radio discourse because it enables content from different radio programmes to be recovered in times other than real time. We could say that the Internet puts a stop to the *fleetingness* of radio: the order and synchronic time of its narrative sequence, characterised by the *here and now* is broken with the diachronic consumption made in deferred time and in a selective fashion.

Information on the Internet is presented in a non-hierarchical, interactive and hypertext fashion and permits increased audience involvement, which means it is possible to personalise consumption. It thus facilitates the delimitation of audiences for a better financial return and impact for advertisers and promotes the business extension of radio now aimed at sound, particularly the music business.

In terms of making the most of the interactive resources that the Internet offers, the main marketing and communication tools employed with users are email, chat rooms, discussion forums and distribution lists that allow multiple options, including information requests, opinions, participation in competitions or voting, through to the exchange of data and files between users. Radio has to make the most of this effective instrument for interacting with listeners and profiling programmes more in line with new listener demands.

Although the phenomenon is on the rise and the advantages are clear and numerous, it would be wise to sound a note of caution about using online radio. This is mainly because, after a speedy implementation process in developed regions, where between 60% and 80% of the population has access, the Internet continues to be a scarce resource in other regions of the world, with a penetration of just 1%. Furthermore, signal quality is still not as good as the sound quality offered by FM, although the response capacity is conditioned by the features of the user's computer and software and the transmission speed of the phone line, at least until broadband becomes more generalised.

With regard to reception, the simultaneous and global audiences are usually reduced in line with Internet capacity,

bringing radio back into a fixed and non-portable environment. To date, European broadcasters have not awarded commercial viability to the Internet: despite the rise in the number of surfers consulting websites and the growth in the on-demand radio and music trade, radio stations still don't see it as a good business.

With these advantages and disadvantages, the truth is that the Internet is now being used as a test platform. In the US and Europe, both public and private radio stations use the Internet as a laboratory and testing ground for the presentation of new formats and the development of multimedia services.

Although the basic product of online radio often continues to be antenna sound, it is not limited to transferring existing content and formats. Online radio makes it possible to identify new formats by audience sections and to establish a new time cadence which corresponds to the new ways of listening to the radio. The Internet is thus installed as a device and a laboratory of specialised content which makes it possible to identify and trace new audiences shares while also helping consolidate station brands. It should not be understood just as a complementary support but also as a fundamental part of new content development and management strategies.

The Digital Radio Audience

From the early years of experimentation in digital radio, work was also done to identify the potential DAB market because there were doubts that there would be a real demand on the part of audiences. The first study prepared by the company Touche Ross & Co. in 1992, and the later reports commissioned by the EBU and the WorldDAB Forum in subsequent years, reflected that interest in the new technology was associated with the quality of the reception and absence of interference so long as it did not involve more than 10% in added cost.

These studies were done with samples of the population that had little information about the system and practically no experience as digital-radio listeners. However, when studies were done with qualified samples who knew about the technology and did have access, the figures changed radically in favour of digital radio.

The latest study prepared by British firm Continental Research into audiences found that digital-radio listeners were gradually abandoning analogue stations as they became more familiar with the new technology. The survey, published in the first quarter of 2004 was made with 502 people aged over 16 who had digital television and/or DAB receivers in their homes in the UK.

The study revealed that 68% of the people polled acknowledged having increased their listening time (TSL, Time Spent Listening) since having access to a digital-radio receiver. Two-thirds tuned in to the radio for 29 hours per week, 12 hours more than their previous listening habits. With regard to content, music programming and quality of the reception were the reasons behind the growth in listening time.

The same survey found that nearly 75% of the listeners in the sample consulted data stations, essential for discovering the name of the singer and track played and to obtain information about programming on the air. Digital-radio listeners said they had a satisfaction level of 94-98% with the quality of the reception, the range of programmes on offer and the facilities for finding the stations.

We can therefore say that, except for the pitfall of the availability of low-cost receivers, there is a potential market for the implementation of digital radio.

The Analogue Switch-off

Another burning question with regard the implementation of digital radio is the debate that has opened up around the possible analogue switch-off. Although some European countries mention dates beyond 2010 for transferring radio and television services to digital supports, it is not a question with an easy answer. To begin with, it is not possible to apply the same market logic for radio as for television.

A recent study by the European Commission (COM 2003, 541 final, 17 September 2003) found that the digital conversion of broadcast systems was a complex process with important economic and social implications not limited to a simple "technical migration".

The analysis is primarily political and it is in this area that the interests of each State run up against market demands. Although the advantages and needs for proceeding with the

analogue television switch-off are clear, the report found that the same criteria could not be applied to the case of radio. This was mainly because the radioelectric resources approved for digital radio, as I said earlier, are still too scarce to include the broadcasters currently operating in the various countries. Furthermore, Europe has failed to make tests or transmit on the authorised L-band, further limiting transmission possibilities.

The Key to Success

For now, success in implementing digital radio depends on overcoming the obstacles that were apparent in the mid-1990s.

With respect to DAB, it is necessary to have: authorisation for *more frequencies*, as the current ones are not enough; *flexible regulatory frameworks* that stimulate private and public initiatives, as the current ones are excessively bureaucratic; *broadcasters prepared to take risks* in developing new content and services and carrying out aggressive informational campaigns for audiences, as they have so far proved reluctant to invest in an uncertain future; and *receivers available at a low cost*, which integrate different digital possibilities and are easy to use, as for now they continue to be inaccessible. (Martínez-Costa 1997: 43 on).

With respect to the IBOC, HD Radio, DRM and S-DAB systems, it is necessary to successfully move beyond the current experimental stage in a way that ensures optimal technical conditions and complementarity among all the systems. Steps have already been taken in this direction; now the systems just have to mature and be brought technically into line with all the supports.

Online radio in Europe at least has failed to achieve a solid development. Using it as a laboratory and testing ground can help present new formats, develop multimedia services and delimit new audiences.

Having resolved the administrative and technical questions, the area now to be tackled is the radio model to reinvent and, particularly, the content to develop. However, now more than ever before, the debate around the technology is operating as a brake and freezing the possibilities of change. We have spent more than 10 years discussing the potentialities of digital radio, the added

values of the new supports, unfavourable market conditions, coverage, inexistent receivers and the announcements of unviable analogue switch-offs. These discussions have prevented us from beginning to discuss content, the question that both public and private broadcasters must take on without further delay.

The current radio programming model has run its course even before the digital debate has begun. However, in spite of this, and in the short term, it continues to be profitable to companies. It will not be so in the medium term. Broadcasters have to think about tomorrow's market, about the young audiences they are today having problems capturing, not to mention making loyal. As occurred with the appearance of FM radio, digital radio is the excuse or technological trigger for developing the new content that radio audiences are now demanding. Fundamentally, this new type of radio will have to develop new, specialised formats with a great level of synergy and interaction of content and services among the different digital supports.

Otherwise, we will be facing the situation that Bertolt Brecht presaged in his 1932 work on radio theory, in which we will have full availability of stations but nothing to say: "[radio] has the possibility of speaking to everyone, but looking at it closely [it is important it has] something to say". Or, what is worse, the things radio says may not interest listeners in the digital era.

Notes

1. The broadcast method for the DAB signal approved by the ETSI is characterised by using the multiplex broadcast system called COFDM (Coded Orthogonal Frequency Division Multiplex) and the signal-compression system called MUSICAM (Masking Patter Adapted Universal Sub-band Integrated Coding and Multiplexing) in the modulation process, which later assimilated the conditions of the MP2. In the COFDM system, the broadcast information is shared among a large number of interlinked carriers that use multiple routes between the transmitter and receiver to allow a better use of the frequency spectrum and to prevent the numerous interferences of multiple propagation. The MUSICAM compression system reduces the quantification of information by eliminating frequencies that are irrelevant or redundant to the human ear. These technical premises make it possible to establish synchronised, single-frequency networks at the national and regional levels and install networks of complementary transmitters in areas where reception from the principal transmitter is difficult or impossible due to shadow areas (Martínez-Costa 1997: 37-42).
2. The rise in the number of stations available was possible because the Radio Authority allowed the frequency blocks to redistribute the initial broadcast capacity of six channels to obtain 12 or 18 audio channels.
3. During the 12 months from January 2002-January 2003, the interest generated in the new services rose, as did the number of subscribers. XM figures grew from 17% to 32%, while in the case of Sirius figures were up from 8% to 18%, according to a report from Arbitron.

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Websites for Consultation:

DIGITAL RADIO MONDIALE: www.drm.org

EUROPEAN BROADCASTING UNION: www.ebu.ch

IBIQUITY DIGITAL: www.ibiquity.com

WORLD DAB: www.worldddab.org