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Radio in 2030: A study on the crucial variables in the future of the sector in Catalonia

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Abstract
After an initial study on the future scenarios of radio in Spain (Robert-Agell, 2023), the focus is now on Catalonia, which has its own media ecosystem and a radio sector that can be distinguished from the rest of the Spain in its supply, consumption, regulation and players, both public and private. With 100 years of history under its belt, Catalan radio has shown a notable capacity for adaptation (Bonet, 1995; Franquet, 2001) but is now facing new structural challenges that may alter its future.
Using the theoretical framework of media economics and scenario planning, the research drew from a survey of key players to identify the critical variables that will define the Catalan radio industry in 2030. This study adds to the limited structural research on media economics applied to radio and the almost non-existent foresight production on the media. It aims to serve as a guide for addressing the need to update the management models and adapt the regulations within a context of digital transformation and profound demographic changes.

Keywords
Radio, Catalonia, scenario planning, future, variables.

Resum
Després d'una primera investigació sobre els escenaris futurs de la ràdio a Espanya (Robert-Agell, 2023), la mirada se centra ara a Catalunya, que disposa d'un ecosistema mediàtic propi i un sector radiofònic que es distingeix de la resta de l'Estat en oferta, consum, regulació i actors, tant públics com privats. La ràdio catalana, amb 100 anys d'història, ha demostrat una notable capacitat d'adaptació (Bonet, 1995; Franquet, 2001), però s'enfronta a nous desafiaments estructurals que podrien alterar-ne el futur.
Utilitzant el marc teòric de l'economia dels mitjans i la prospectiva, la investigació recorre a l'enquesta a actors clau per identificar les variables crítiques que definiran la indústria radiofònica catalana el 2030. Aquest treball contribueix a la limitada investigació estructural en l'economia dels mitjans aplicada a la ràdio i a la gairebé inexistent producció prospectiva sobre mitjans. La investigació vol servir d'orientació per abordar la necessitat de revisar els models de gestió i adaptar la regulació en un context de transformació digital i profunds canvis demogràfics.

Keywords
Ràdio, Catalunya, prospectiva, futur, variables.

1. Introduction. State of the matter

Catalonia has its own media ecosystem and a particularly rich, diverse radio sector that is in many ways different from the rest of Spain (in its supply, consumption, regulation, public and private players, etc.). This article sprang from the desire to continue the research on radio's future scenarios in Spain (Robert-Agell, 2023) and to transfer knowledge. Criteria for judgement are needed at a time when the media sector is experiencing a period of profound, radical changes, driven by the ageing of the population and the new generations' disruptive media diet, as well as by the speed and universality of the digital transformation in recent decades.

Catalan radio has proven its ability to adapt throughout its 100 years of history (Bonet, 1995) by playing different roles in different periods (Franquet, 2001). However, today this may be changing, and many voices are warning about the need to update the management models and adapt to an environment

in the throes of transformation (Sellas, 2013; Fernández-Sande & Gallego, 2018; Piñeiro-Otero & Pedrero-Esteban, 2022; Fernández-Sande & Rodríguez-Pallares, 2022; Prata *et al.*, 2024).

The purpose of this research is to determine the possible factors or variables which will define the scenarios for this industry in Catalonia in the year 2030 based on their impact and the degree of uncertainty. The research aims to serve as a guide for addressing the need to revise the management models and adapt the regulations in the context of digital transformation and profound demographic changes.

The answers will be grounded on the theoretical framework of media economics and scenario planning as both science and a methodology: a literature review and a survey of the players and their sphere of interest will determine both the variables and their importance. This article joins the scant structural research and media economics applied to radio and the almost non-existent scenario planning on the media.

2. Theoretical framework

2.1 Media economics and scenario planning

This study falls within the purview of the media theoretical tradition and media economics, which explains the functioning of this industry and the behaviour of the companies within it, as well as how the economic, financial and regulatory forces influence the operations of media markets and their effects on society (Albarran, 2014; Cunningham *et al*., 2015). It also justifies individual consumption behaviours and the decisions —media management— taken in this industry (Picard, 2006).

Macroeconomics accounts for overall factors circumscribed within megatrends, the currents where economies will evolve in the forthcoming decade, which are almost impossible to change (European Strategy and Policy Analysis System, 2019). Küng (2016) states that the PESTLE model may be more geared towards professionals and researchers but is useful for organising these major trends, and she highlights the effects on the media of both demographic changes (and consumption changes among the younger generations) and changes in regulation and the digital transformation (which completely alters the relationship between companies, audiences and advertisers (Elavarthi & Chitrapu, 2021).

The application of the Industrial Organisation model enables the market structure, the reasons for companies' behaviour and the performance of this industry to be ascertained (Hoskins *et al*., 2004). Variables like the number of sellers and buyers, product distinction, entry barriers, cost structure and the degree of vertical integration make it possible to explain everything from the formation of monopolies to perfect competition (Albarran, 2010). In the case of media markets —like the radio market— there is a tendency towards concentration (theory of the firm) because of economies of scale and scope (Doyle, 2011) and the huge entry barriers (Hoskins *et al.*, 2004). The dilemma for regulators lies in calibrating the effects of their intervention: excessive concentration may run counter to consumers' interests, but excessive fragmentation —which makes companies less efficient— may also run against the public interest (Doyle, 2011), such as given the power of digital platforms.

Government interventions come when there are market deficiencies (like the abuse of a dominant position), and the main tools used are regulation and public media management. Positive externalities can be promoted (by encouraging the dissemination of high-quality content) and negative externalities can be minimised (like banning content that are harmful for society) (Doyle, 2011). In both cases, government decisions have direct and indirect economic effects (Alexander *et al*., 2003). Likewise, the prerogative to become an operator and allow financing from advertising along with the injection of public funds leads to conflicts with private operators. Doyle (2011) reports this and adds that it is not easy to decide what financing mechanism is the most desirable for the public service. Hoskins *et al*. (2004) draw from the conclusions of the Peacock Committee (1986), which recommended not allowing the BBC to be financed with advertising because of its effects on the system as a whole. In any case, the dual market logic pushes public operators into the same battle for audiences as private operators (Alexander *et al*., 2003). If we add management's risk aversion, we find an explanation for the similarity of the broadcasters' lineups (Doyle, 2011).

The audience's individual listening choices can also be explained by media economics: they are the product of experience that can only be evaluated by their use (Hoskins *et al.*, 2004) and are a choice based on both their utilitarian and symbolic value (Elavarthi & Chitrapu, 2021).

Media economics also points to the need for anticipation in an extraordinarily complex environment (Chan-Olmsted, 2005) and the need to identify long-term trends (Albarran, 2014). On this point, it connects with scenario planning —which makes neither prognostications nor predictions but instead collects knowledge about possible scenarios— which has attracted a huge academic community (Spaniol & Rowland, 2018) equipped with both theoretical frameworks (De Jouvenel, 2019; Minkkinen, 2020) and its methodologies (Schultz, 2015).

The first step in defining which variables may be crucial in shaping radio in 2030 is to identify what stage in its life cycle this industry is in today. Picard (2011) and Küng (2016) situated the media in the maturity stage. Lehman-Wilzig and Cohen-Avigdor (2004) use the concept of natural lifecycle from biology and apply it to the evolution of the media environment subjected to digital transformation: the phase of defensive resistance begins after birth, market penetration, growth and maturation. This ends in either adaptation, convergence or obsolescence. Robert-Agell and Bonet (2023) situate the radio industry in Spain in the defensive resistance stage.

2.2 The Catalan market

This description, which is necessarily incomplete due to the scope of the article yet sufficient for the purpose of this study, points to the main features in the evolution of this market (supply, consumption and financing).

2.2.1 Evolution of the supply

We have to distinguish between the programming available, management companies and the number of frequencies. What Bonet (1995) wrote as the definition of the structure of the sector in Spain (the only case in Europe where the public and private sectors coexist where neo-regulation allows both more private and more public radio stations to enter the market) perfectly describes the evolution of the radio sector in Catalonia: in addition to an extensive private sector, each political administrative level (state, regional and local) develops its media system (Fernández-Quijada *et al.*, 2013).

Regarding private radio stations, the business concentration process has been amply documented (Bonet, 1995; Martí, 1996; Bonet, 1998; Bonet, 1999; Martí & Bonet, 2000; Artero Muñoz *et al*., 2021; etc). The changes in the regulatory framework and political decisions on its enforcement (such as by fostering station affiliation in tender processes) have consolidated a dynamic which is also fostered by economic reasons (gain in volume and efficiency).

The decrease in the number of companies managing private stations, despite the increase in frequencies after the different technical plans, attests to concentration. The main corporate transactions were Prisa's purchase of shares in 2005 and the COPE agreement to manage all the Punto Radio stations (including the frequencies from the former Catalan company owned by Luis del Olmo) in 2013. Concentration is also taking place with independent operators' licences for stations that cover all of Catalonia (RAC1 and RAC 105 owned by Grupo Godó, and Grup Flaix), as well as individual counties.

In 2023, 168 licences were operated by seven groups and broadcast on stations (in Catalan or statewide), and 29 frequencies are local broadcasters or small stations with a regional or county reach. This proportion has remained approximately the same since 2013.

On the other hand, the supply of public frequencies has risen 34.6% since 2001, and in absolute numbers, it has gone from 407 to 548 —most of them due to the proliferation of the CCMA. The private sector accounts for one-third of this spectrum.

2.2.2 Evolution in consumption

The radio audience in Catalonia has remained at around 3.8 million people in the past decade, which is under its historical peak of 4.2 million in 2012. The net loss of listeners is found in music radio stations, and the gradual ageing of the audience as well as attrition among younger generations should also be noted.

Table1. FM Frequencies and Ownership

Years	Private	Municipal	CCMA	RTVE
2001	94	201	155 *	51*
2022	197	213	270	65

Source: Catalan Audiovisual Council, BIAC and Annual Report, except (*) Franquet (2001).

Table 2. Evolution of the average age

%	2000	2023
Total population	40.5	43.4
Total listeners	42.2	48.7
Total general stations	47.9	52.2
Total music stations	33.4	44.5

Source: Idescat for Total population. AIMC, EGM cumulative third sweep, Monday to Sunday, 2000 and 2023.

Table 3. Evolution of the audience and of the population aged 14 to 19

%	2000	2023
Total population (15 to 19)	6	5.5
Total listeners	8.3	6.1
Total general stations	3.2	4.2
Total music stations	14.6	7.8

Source: Idescat for Total population. AIMC, EGM cumulative third sweep, Monday to Sunday, 2000 and 2023.

Table 4. Evolution of the audience and of the population aged 20 to 24

%	2000	2023
Total population	8.1	5.4
Total listeners	10.2	5.5
Total general stations	5.8	3.7
Total music stations	16.6	7.4

Source: Idescat for Total population. AIMC, EGM cumulative third sweep, Monday to Sunday, 2000 and 2023.

2.2.3 Financing. Advertising and public contributions

2.2.3.1 Advertising

Determining the evolution of the radio advertising market in Catalonia comes upon three difficulties: the lack of a systematic historical record before 2007, the atomisation of some of these operators —public and private— and the very definition of what comprises this market. Martí (1996) draws from the estimate of the total volume of the state market (according to figures from InfoAdex) and rates it at 10% (6 billion pesetas), while Martí and Bonet (2001) raise this share between 10 and 11% to 8 billion pesetas. The records based on figures from Idescat do not represent the reality of radio advertising in Catalonia (the income category does not distinguish advertising from subsidies, and the income figures of the state radio groups are included in the totals of their respective corporations).

The lack of comparable data prevented us from establishing a dual market correlation until 2007 when the Associació Catalana de Ràdio (Catalan Radio Association) commissioned the consultancy Media Hotline to draw up a report which would be updated every year (even though the lack of official records compels it to make estimates for municipal radio).

If we compare consumption with share (volume of radio advertising over the rest of the media), we find the paradox that the gradual loss of penetration has not come with a loss of advertising share. However, we should note that radio invoiced €50.6 million in 2023, far from the €75.4 million in 2007 and the €54 million pre-pandemic.

The income of the majority of companies in the Catalan private sector (which is more competitive than in the rest of Spain) depends on musical programming. Seventy-two per cent (26 of the 36 brands) are music stations.

2.2.3.2 Public funds

The public funds earmarked for radio in Catalonia by all the public administrations have never been fully quantified. The resources earmarked to the CCMA's radio stations stopped being published in disaggregated form in 2014. Likewise, we should add the funds that the Barcelona Provincial Council allocates to radio content via the Xarxa Audiovisual Local (Local Audiovisual Network, XAL), the funds that the public corporation Radio Televisión Española earmarks to Ràdio 4 and the budgets of the more than 200 municipal stations.

The government of Catalonia earmarks two types of funds to the private radio sector: generic support or structural assistance (for stations that only use Catalan) and assistance for projects (Catalan Secretariat of Media and Dissemination, 2013). In 2022, the government of Catalonia awarded €2.4 million in subsidies to private radio companies, €1.7 million of which is for projects and €704,687 for structural assistance (CAC, 2023 and Catalan Ministry of the Presidency, 2023). If we add this amount to the advertising resources earned from the market, public funds account for only 5.2% of the financing of private radio in Catalonia.

Table 5. Evolution of radio's penetration and share in Catalonia

	Penetration *	Share **	Volume (€M) **
2000	54.9		
2001	55.2		
2002	55.1		
2003	59		
2004	55.9	9.7	
2005	55.6	10.2	67.2
2006	55.1	10.2	70.1
2007	52.3	11.6	75.3
2008	52.5	13	71.1
2009	56.1	13	57.8
2010	57.8	13.2	56.4
2011	59.7	13.6	50.4
2012	64.7	13.9	45.1
2013	63	13.8	43
2014	60.6	13.5	44.1
2015	61.9	13.5	47.1
2016	60	13.9	48.3
2017	60.5	14.9	51.4
2018	57.9	15	50.8
2019	57.3	16.3	54.0
2020	55.5	17.5	43.2
2021	55.8	16.7	46.2
2022	56.1	16.7	47.9
2023	54.7	17	50.6

Source: *AIMC, 2023. EGM cumulative third sweep, Monday to Sunday.

**Media HotLine & ACR, *Informe de la situació de la ràdio a Catalunya*.

2.3 The differential factors that have shaped the Catalan market

First, the political decisions and legislative framework, along with the existence of its own language, explain the unique radio supply in Catalonia compared to the rest of Spain (Guimerà, 2014). De Carreras (1987) highlights the importance of radio regulation in spreading the use of the Catalan language, and De Moragas Spà and López (2000) describe the linguistic approach of the government of Catalonia's communication policies by both the scarce presence of Catalan after the restoration of autonomy and the lack of authority over telecommunications. Guimerà (2014) credits the successive governments of Jordi Pujol (1980-2003) with creating Catalonia's media system within the framework of a political and communication strategy with powerful public means (CCMA) and the granting of frequencies to local companies. Fernández-Quijada *et al*. (2013) also reveal the centrality of regulation in designing the media systems of

stateless nations and the role of the language. Consequently, Corominas (2003) highlights the growth in the supply and consumption of radio in Catalan between 1981 and 2002, when it rose from 19.3% to 50%. This percentage reached 71.8% in 2022, according to figures from the AIMC reported by the ACR (2023), which situates radio as the medium with the highest consumption in Catalan. Private radio stations account for 74.1% (ACR, 2023).

Setting language quotas is nothing new in radio broadcasting. Balsebre (2002) recalls that during the Franco dictatorship in the mid-1960s, the Spanish Ministry of Information and Tourism imposed percentages of music in Spanish to halt the penetration of pop music in English.

Secondly, the radio industry has adapted to the changes that have taken place in the society in which it operates. The evolution in contents and programmes attest to this capacity to respond to its demographic context (Bonet, 1995 and Balsebre, 2001 & 2002). The main social changes that took place in Catalonia between 2000 and 2023 are the increase in the foreign population (which accounted for 2.9% of the population in 2000 and 16.32% in 2022 —22% in Barcelona—) and the drop in the birth rate, with the consequent ageing of the population. In 1975, the mean age was 33.7 years, in 2000 it rose to 40.5 and in 2023 it was 43.4 years. The largest population group is now made up of people between the ages of 40 and 49, while in 2000 the largest group was between the ages of 25 and 34 (Idescat, Statistical Institute of Catalonia, 2024).

Thirdly, the digital disruption has stormed onto the scene and is auguring changes throughout the entire audio chain: production, distribution and consumption. According to the Enquesta de Participació Cultural a Catalunya (Cultural Participation Survey of Catalonia), among the respondents who stated that they had listened to music the day before, 61.3% had used platforms (Spotify, Deezer, etc.) (Generalitat de Catalunya, 2022). The increase in the consumption of digital audio also has effects on radio, which has doubled the number of Internet listeners in four years. Nonetheless, the sector is not monetising this digital consumption, given that in 2023 digital advertising only accounted for 2.2% of the sector's total invoicing, while for Spain as a whole, this figure was 3.5% (ACR, 2023).

These figures prove Bonet and Fernández-Quijada (2011) right on the digital growth of new forms of consumption, as well as Sellas (2013) on the maintenance of an analogue business model, with the risk of being left behind in the exploitation of digital audio.

Table 6. Comparison of digital audiences and percent of digital income over total income

%	Internet audience*	Over advertising income**
2019	5.8	1.4
2020	7	2.4
2021	9	3.2
2022	11.2	3.4
2023	12.6	2.2

Sources: *AIMC, EGM cumulative third sweep, Monday to Sunday.

**Media Hotline & ACR, *Informe de la situació de la ràdio a Catalunya*.

3. Methodology

The goal of scenario planning is to anticipate possible futures, and it usually draws on the scenario methodology. The normative use of scenario planning tools is broadly described —to prevent it from being confused with predictions or forecasts— as are the most frequent errors —based on biases or intuitions (Popper, 2008; Balarezo & Nielsen, 2017). This research falls within the Intuitive Logics scenario planning school due to the purpose, the tools used, the nature of the participants and the identification of forces and variables (Bradfield *et al*., 2005; Sjøvaag & Krumsvik, 2018; Spaniol & Rowland, 2019). The factors with the greatest impact —regardless of their degree of uncertainty— are examined due to the significant changes they may cause in the future (Ratcliffe, 2000; Lindgren & Bandhold, 2003).

The Intuitive Logics school allows for a broad time frame: between 5 and 20 years (Bradfield *et al*., 2005). The decision in this study to situate it in 2030 first meets the knowledge transfer goal proposed —to keep a sufficient connection with the present to get the players involved (Das & Ytre-Arne, 2017). Furthermore, in such a changing context as the media, caution and precedents indicate the usefulness of situating it on the low end of the time range.

To identify the variables that will determine the future of radio in Catalonia in 2030, the factors pointed to by the megatrends were crossed with the results of the industrial life cycle research on radio in Spain (Robert-Agell, 2023) and with the literature review on the Catalan market. Seventy-four variables which meet these conditions of influencing the future have been identified. This entails expanding the ones obtained in the prior research by 37% due to the specificities of the Catalan market. They are organised by areas to design the survey.

Table 7. Key variables determining the evolution of radio in Catalonia

Factors		
Social and economic	A - G	7
Political and regulatory	H - S	12
Technological	T - AA	8
Dual market	AB - AH	7
Business and management model	AI - BG	25
New competition	BH - BV	15

Source: Own work.

Once the players and the circle of influence on the radio sector were identified (people in charge with the ability to influence in their respective fields, Heijen, 2005), and the survey asking about these variables was drafted (via self-administered electronic Google Forms questionnaires), 81 emails requesting participation were sent, to a representative sample of middle and senior management profiles of both public and private operators (local, Catalan stations or state stations), as well as their spheres of interest (lawmakers, regulators, government, advertising market and distribution) and a sample of scholarly researchers and other experts.

We sent the emails on 8 and 9 March 2024, and anyone who did not answer by 20 March got a reminder. The text stated that the goal of the research was to provide tools for making decisions that would help to pinpoint uncertainties and guide the sector among all possible futures towards desirable scenarios. The variables had to be rated between 0 and 10, and anonymity was guaranteed in the presentation of the results. 'Impact' was defined as the capacity to significantly alter the sector, and special emphasis was placed on defining 'uncertainty'. The highest level of uncertainty (10) indicated that it was impossible to anticipate how that variable would evolve by 2030, a judgement that should not be based on desire or personal will but instead be an opinion on its potential for happening.

We obtained 48 responses, which accounts for 59.3% of the initial sample. Soriano (2007) considers 60% the high side of success in responses to social research. Even though the sample may seem small and a limitation of this study, its value lies in the representativeness of the profiles surveyed (due to their professional position in radio or its sphere of interest: political, institutional or academic), which matches the recommendations made by Van der Heijen (2005). The results were organised according to the degree of impact as a factor to support decision-making among operators and stakeholders (Balarezo & Nilsen, 2017), and they are presented in tables to make them optimally readable.

4. Results of the surveys

When interpreting the results, we took all the factors over the average (equal to or higher than 6.9) as relevant in impact, and all the factors equal to or under the mean of 5.1 as uncertain.

The table organised by highest impact (see Table 8) reveals the importance of factors that could negatively affect the future of the sector, unlike the variables organised according to minimum uncertainty (see Table 9): in this case, despite the persistence of negative factors, they are counterbalanced by the variables that point to the strengths and opportunities that the medium will maintain.

The results of the survey according to the highest level of impact (Table 8) show a widespread opinion that the conditions for the development of the radio industry will worsen, which

Table 8. Survey results organised by level of impact (equal to or higher than 6.9) and uncertainty (equal to or lower than 5.1)

	Factors	Impact	Uncertainty
V	FM receivers will disappear in cars.	**8.5**	**5.5**
H	Digital listening alternatives will lead to the digital switchover.	**7.9**	**5.8**
AB	Radio's penetration will decrease among the total audience.	**7.7**	**5.4**
W	FM tuning on household receivers and mobile telephones will disappear.	**7.7**	**5.3**
BE	Radio will lose its rights to broadcast football, as has happened with TV stations.	**7.6**	**5.6**
Y	Companies owning personal voice assistants and mobile telephones will worsen the conditions to distribute radio companies' signals.	**7.5**	**5.6**
BC	The conditions for using the repertoire of copyright organisations will worsen (due to cost and restrictions on the possibility of use).	**7.5**	**5.4**
BT	The conditions for broadcasting advertising will be limited for public radio.	**7.3**	**5.3**
U	Users will prefer to consume audio accompanied by video.	**7.2**	**5.3**
BD	The decision-making and influencing power of media clearinghouses will increase.	**7.2**	**5.6**
BS	Advertising will disappear from public radio.	**7.1**	**5.9**
P	The obligation to develop DAB+ or an equivalent replacement standard will be imposed.	**7.1**	**5.7**
L	The possibility of exploiting licenses of municipal and CCMA stations will become more flexible, allowing private operators to exploit them.	**7.1**	**6.0**
AD	The importance of the CCMA will increase in competition with radio audiences.	**7.0**	**5.4**
BB	Ground signal distribution costs for FM waves will increase substantially.	**7.0**	**5.5**
F	Economic crises will recur more often.	**6.9**	**5.8**
K	A new Technical Plan will be approved with an increase in private licenses.	**6.9**	**6.1**
AA	DAB+ will develop because of its presence in cars.	**6.9**	**5.3**
J	The conditions for licenses in the private sector will worsen (limitation on their length; limitations on syndicated broadcasting, on transfers; new obligations regarding contents; more advertising limitations, etc.).	**6.9**	**5.8**

Source: own work.

could affect the entire value chain. Technology, regulation and changes in the supplier-customer power relations in the sector are the most salient. Technology is relevant because intermediation with the audience is no longer neutral and universally accessible (disappearance of FM in cars, higher consumption of audio via voice recognition devices) and the proliferation of competitors for listening attention and time brought about by the digital transformation. These threats are joined by a negative view of the regulatory context, if the variables perceived as plausible end up happening (worsening of operating conditions, imposition of new obligations like DAB+, digital switchover, etc.). On the other hand, all the environments with which radio interacts are gaining power against the sector's status quo in all phases of the chain: audience empowerment, advertising intermediation, organisations that determine the rights (for football and music), etc.

Regarding the strict radio ecosystem, the only factors that the respondents consider noteworthy in terms of impact on public radio are the possibility of limiting or eliminating advertising on these stations, as well as the fact that these frequencies may end up being exploited by private operators and the possibility that the CCMA may boost the battle over audiences—a possible scenario as long as financing with advertising continues. Therefore, we dismiss possible important effects from the dual local market or the regularisation of third-sector broadcasts.

In contrast, in the table organised according to greatest uncertainty (Table 9), the results of the survey anticipate that it is highly likely that the main strengths of the medium will remain in place, alongside the realisation that the risks and threats once again encompass the entire value chain. What stands out is recognition that radio will maintain its role as a reliable means of communication among both the audience and social institutions, along with its role as an effective influencer among advertisers. There are also a few doubts that technology will continue to gain ground among the threats (more competitors in the supply, lower presence on car

Table 9. Results of the survey organised by level of uncertainty (less than or equal to 5.1) and impact (more than or equal to 6.9)

	Factors	Uncertainty	Impact
AY	Artificial intelligence tools will optimise data management (on the audience and the advertising market).	3.9	8.3
AG	The audience will increase its ability to choose and consume and interactivity.	3.9	7.9
A	The population will age.	4.0	7.4
BG	Radio will maintain credibility and acknowledgement of its efficacy among direct advertisers.	4.1	7.3
BH	Digital native players (podcasting platforms, streaming music services, audio book platforms) will expand their catalogues to include live audio contents.	4.3	7.5
BK	There will be large-scale production of sound contents to be consumed as podcasts.	4.3	7.0
B	Immigration and cultural diversity will increase.	4.4	7.3
AU	Radio will witness improvements in audience studies, both quantitatively and qualitatively, which will include all digital consumption, both scheduled and after-the-fact.	4.4	7.6
AX	Artificial intelligence tools will optimise the production of radio contents.	4.4	7.9
BA	The increase in online radio consumption and podcasts will lead to less interest in new FM licenses and the purchase of existing licenses.	4.5	7.4
Z	Higher development of hybrid radio (combination of contents distributed two ways, radio spectrum and Internet, on the same device).	4.6	7.1
AT	Radios will multiply their supply on segmented audio channels thanks to the Internet.	4.6	6.9
AV	The value of radio and its editorial responsibility compared to digital platforms will be acknowledged due to its contribution to combatting fake news.	4.6	6.9
X	Radio's audio products will lose prominence in vehicles, which are increasingly connected, in favour of online audio services.	4.6	8.2
AF	Radio will lose share in the advertising market.	4.7	7.7
AH	There will be an increase in audience and advertising concentration in groups and stations, both Catalan and statewide.	4.7	6.9
AL	Production costs will decrease.	4.7	7.3
T	The use of voice recognition devices beyond personal assistants will increase.	4.7	7.7
AO	Radio companies will have difficulties transforming the work routines of existing staff to the new digital environment.	4.8	7.1
BF	Radio will lose advertising share in favour of digital media.	4.8	7.3
AR	Radio broadcasters will tend to join local, Catalan or statewide multimedia groups.	4.8	7.1
BL	Social media, Big Tech, etc., will be competitors for sports broadcastings.	4.9	7.4
E	Future generations will live worse than their parents (climate crisis, wars, etc.).	5.0	7.4
BI	New players (Big Tech, TikTok, X[Twitter], etc.) will increase their production of live audio contents.	5.0	7.2
M	Public subsidies for public radio activities will increase.	5.0	7.1

Source: own work.

Table 10. Order of the number of variables according to the category of the factors

Factors	According to impact	According to uncertainty	Total
8 technological	5	5	10
25 business and management model	3	4	7
7 social and economic	1	3	4
7 dual market	2	2	4
12 political and regulatory	2	2	4
15 competition	2	2	4

Source: own work.

dashboards, share lost to the digital advertising market, etc.), but this may be a positive impetus for radio due to artificial intelligence's capacity to optimise management, its ability to efficiently multiply the audio products produced by the stations themselves and the improvement in audience studies thanks to the integration of results on digital listening. The surveys also reflect a continuation of the logic of concentration among the existing private broadcasters, while the respondents do not believe it is likely for new radio stations to be launched, nor would it have a major impact. The certainty about competition in the radio sector revolves around digital platforms, devices and social media.

Finally, the ageing of the population and the increase in cultural diversity because of immigration forms the social context within which radio has to once again demonstrate its ability to adapt.

Even though it was not the area with the most variables, technological factors show the highest number of coincidences in the results on both impact and uncertainty.

5. Conclusions

The opinions collected by this study have enabled us to provide answers on the variables around which the future of radio in Catalonia will revolve in 2030. Players and the environments of interest may use this information according to their objectives.

Taking the results of both tables together, the transformations caused by digitalisation in the value chain are the factors that may most deeply shape the scenarios for radio. This first affects the production of the broadcasters, as they will have to determine how to make the unquestionable advantages of the technological advances compatible with the professionals on staff today. It also affects the distribution of their products, given that until now, operators could manage the radio signal themselves (broadcast centres) or they could use the services of companies that do not seek to exploit the signal for their benefit (carriers like Cellnex and Axion), and FM receivers are cheap and ubiquitous. All this could worsen the access conditions and costs that could be charged to broadcasters to be on the digital audio distribution channels and smart voice recognition devices, and even to guarantee their presence in cars. Finally, this digital transformation affects consumption with an empowered audience and an exponential increase in competition, given that as an information or entertainment product, sound is no longer exclusive to radio broadcasters. However, digital transformation provides both threats and opportunities: improved audience studies, optimisation of production tasks thanks to artificial intelligence and the multiplication of the broadcasters' channels stand out as positive factors in the business and management model.

According to the results of the surveys, the audience and advertising concentration trend in groups and stations will continue in response to the effect of radio's loss of importance in the advertising market in favour of the digital market, paradoxically despite the improvement in audiences, with all that entails for both the optimisation of the production of sound contents tailored to the target audiences and the improvement in the return demand (metrics) by the advertising market.

The ageing of the population and the transformations caused by immigration are the main factors in impact and uncertainty in the social sphere. Throughout its history, radio has been able to connect with an ever-changing audience, but it is now facing a twofold challenge: while it is adjusting its contents to the listening habits and preferences of a demographic pyramid that is ageing and remains loyal to it (with news and entertainment contents on general radio stations and more talk radio or adult music, or oldies, on music stations), it is not reaching younger audiences (who tend towards digital mobile consumption and the creation of communities away from the radio). On the other hand, the coincidence in the high impact of the population growth of newcomers from other cultures (who now account for one-fifth of the population) coupled with the high uncertainty that comes with it is a symptom of the lack of strategies to address this.

Legislative and regulatory intervention, in the respondents' opinion, may occupy a core role as a factor not because of its ability to shape radio (as it has done in the history of this market) but as a threat or defence and protection against some of the prominent variables in impact and uncertainty. This will depend on the decisions taken. The future of FM broadcasts (like spectrum band, household and car receivers) and the question about the development of DAB+ (without interest

from the private sector and with some recent initiatives in the public sector) generate both uncertainty and a prediction of impact, and it is up to lawmakers or regulators to set the conditions to secure it. Something similar occurs with the competition from digital platforms, which are not subject to the same regime of content obligations as radio broadcasters. Also worth highlighting are the consequences of the worsening of the economic conditions of the rights to use repertoires and the loss of football broadcasting rights, two core areas on the general radio stations' lineups which may ultimately be subject to what is determined by the regulatory provisions. Likewise, the complementarity or competition between the public and private sectors and the destination of the public administration's funds within the system as a whole are prominent regulatory and public-intervention factors in the system.

Radio's continued recognition for its reliability and advertising efficacy should also be noted. In a context in which competition for audience time and attention and advertising market share is increasing, radio will continue to be a safe bet, albeit with a gradual decrease in its audience and advertising share, which is shifting towards digital media.

These conclusions are a sample of how exploiting these data using the Intuitive-Logics participatory methodology may be useful, and this is why the complete results organised by impact have been included in the annexe.

From here forward, two pathways are possible: one, which should enable the scenarios to be sketched following the scenario planning methodology, and the other, which entails setting priorities based on these results: the organisation of the variables according to impact and uncertainty are a fairly clear indicator for strategies in the present —for both the players and the spheres of interests— to guide the probable ones, and of those, the desirable ones, among possible futures.

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Annexe

We believe it is valuable to offer the results of all the statements on the variables organised according to their level of impact while indicating their degree of uncertainty. These data can provide guidance on what is predicted not to have a relevant effect and may be useful for both the players and their spheres of interest. The variables have been organised from the highest to the lowest impact, regardless of the level of uncertainty.

	Variables	Impact	Uncertainty
V	FM receivers will disappear in cars.	8.5	5.5
AY	Artificial intelligence tools will optimise data management (on the audience and the advertising market).	8.3	3.9
X	Radio's audio products will lose prominence in vehicles, which are increasingly connected, in favour of online audio services.	8.2	4.6
AC	Loss of penetration among younger audiences.	8.1	4.5
H	Digital listening alternatives will lead to the digital switchover.	7.9	5.8
AG	The audience will increase its ability to choose and consume and interactivity.	7.9	3.9
AX	Artificial intelligence tools will optimise the production of radio contents.	7.9	4.4
AB	Radio's penetration will decrease among the total audience.	7.7	5.4
B	Immigration and cultural diversity will increase.	7.7	4.4
W	FM tuning on household receivers and mobile telephones will disappear.	7.7	5.3
AF	Radio will lose share in the advertising market.	7.7	4.7
T	The use of voice recognition devices beyond personal assistants will increase.	7.7	4.7
AU	Radio will witness improvements in audience studies, both quantitatively and qualitatively, which will include all digital consumption, both scheduled and after-the-fact.	7.6	4.4
BE	Radio will lose its rights to broadcast football, as has happened with TV stations.	7.6	5.6
BH	Digital native players (podcasting platforms, streaming music services, audio book platforms) will expand their catalogues to include live audio contents.	7.5	4.3
Y	Companies owning personal voice assistants and mobile telephones will worsen the conditions to distribute radio companies' signals.	7.5	5.6
BC	The conditions for using the repertoire of copyright organisations will worsen (due to cost and restrictions on the possibility of use).	7.5	5.4
BA	The increase in online radio consumption and podcasts will lead to less interest in new FM licenses and the purchase of existing licenses.	7.4	4.5
E	Future generations will live worse than their parents (climate crisis, wars, etc.).	7.4	5.0
A	The population will age.	7.4	4.0
BL	The social media, Big Tech, etc., will be competitors for sports broadcasters.	7.4	4.9
AL	Production costs will decrease.	7.3	4.7
BF	Radio will lose advertising share in favour of digital media.	7.3	4.8
BG	Radio will maintain credibility and acknowledgement of its efficacy among direct advertisers.	7.3	4.1
BT	The conditions for broadcasting advertising will be limited for public radio.	7.3	5.3
BI	New players (Big Tech, TikTok, X[Twitter], etc.) will increase their production of live audio contents.	7.2	5.0
U	Users will prefer to consume audio accompanied by video.	7.2	5.3
BD	The decision-making and influencing power of media clearinghouses will increase.	7.2	5.6
BS	Advertising will disappear from public radio.	7.1	5.9
Z	Higher development of hybrid radio (combination of contents distributed two ways, radio spectrum and Internet, on the same device).	7.1	4.6
AO	Radio companies will have difficulties transforming the work routines of existing staff to the new digital environment.	7.1	4.8
P	The obligation to develop DAB+ or an equivalent replacement standard will be imposed.	7.1	5.7
L	The possibility of exploiting licenses of municipal and CCMA stations will become more flexible, allowing private operators to exploit them.	7.1	6.0
M	Public subsidies for public radio activities will increase.	7.1	5.0
AR	Radio stations and broadcasters will tend to join local, Catalan or statewide multimedia groups.	7.1	4.8
BK	There will be large-scale production of sound contents to be consumed as podcasts.	7.0	4.3
AD	Increase in the importance of the CCMA in competition with radio audiences.	7.0	5.4
BB	Ground signal distribution costs for FM waves will increase substantially.	7.0	5.5
F	Economic crises will recur more often.	6.9	5.8
K	A new Technical Plan will be approved with an increase in private licenses.	6.9	6.1
AA	DAB+ will develop because of its presence in cars.	6.9	5.3

AH	There will be an increase in audience and advertising concentration in groups and stations, both Catalan and statewide.	6.9	4.7
AT	Radios will multiply their supply on segmented audio channels thanks to the Internet.	6.9	4.6
AV	The value of radio and its editorial responsibility compared to digital platforms will be acknowledged due to its contribution to combatting fake news.	6.9	4.6
J	The conditions for licenses in the private sector will worsen (limitation on their length; limitations on syndicated broadcasting, on transfers; new obligations regarding contents; more advertising limitations, etc.).	6.9	5.8
I	The conditions for managing municipal broadcasters will worsen (stricter obligations regarding content, management models, etc.).	6.8	5.6
AZ	Artificial intelligence will increase competition for audience listening time with new automated sound content operators.	6.8	5.2
.BR	The CCMA's TV and digital channels will increase competition for the local and Catalan radio advertising market.	6.8	4.5
.AJ	The digital audio products of radio companies will earn profits.	6.8	5.5
O	Editorial obligations will be imposed similar to those of FM stations for large tech operators that distribute audio (Spotify, Amazon, Google, etc.).	6.7	6.1
AN	Radio companies will have difficulties hiring new professionals who are prepared for the new digital environment.	6.7	4.9
AW	Public radio will generate relevant contents to attract children and young people as radio audiences.	6.7	4.8
AP	Private state stations will increase their presence in Catalonia.	6.6	5.8
C	People's amount of free time will increase.	6.6	5.5
N	Public subsidies for private radio activity will increase.	6.6	5.8
D	Commuting time will increase.	6.5	5.1
BJ	Traditional players (TV, press, etc.) will boost their production of live audio contents.	6.5	4.5
AQ	The number of independent private broadcasters will decrease in favour of affiliation with Catalan or state stations.	6.5	5.4
AS	Music will have less importance in thematic radio programming, replaced by talk radio targeted at younger audience segments.	6.5	5.1
AM	Local production will decrease at the expense of station production.	6.4	4.4
AI	Income from paid audiences will be significant (more than 20%)	6.3	5.8
S	The private radio sector will be obligated to contribute to media literacy	6.2	5.7
BV	Competition from illegal broadcasters will increase	6.2	5.3
Q	The CAC will have increased competences at the expense of the Catalan government's competences	6.1	5.6
BM	A new general private station will be launched	6.1	6.4
G	People will have more disposable income to spend on leisure and entertainment	5.9	5.2
AK	Radio stars will be less crucial in achieving companies' audience and advertisement targets	5.9	5.8
R	The public radio sector will be obligated to contribute to media literacy	5.9	5.3
BO	Local public radio will increase its jointly-broadcast programming	5.9	4.5
BN	A new music station will be launched	5.4	5.9
BP	The XAL will increase shared sound contents and its role in the radio market	5.3	4.1
BU	The third sector will be definitively regulated	5.3	5.4
AE	Local public media will increase competition for audiences	5.0	5.0
BQ	Local TV will increase the competition for the local and Catalan radio advertising markets	4.8	5.0
	Average	**6.9**	**5.1**