

The Business Model of Hertzian Radio with A Presence on The Internet: From the Perspectives of Administration and Communication

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ABSTRACT

The business model of the press, in general, and radio, in particular, remained almost unchanged until the 1990s; however, the situation changed with the arrival of the Internet. Therefore, this article aimed to investigate the influence of the antecedents of the business model—value creation, people, strategy, technology, convergence, interaction, and people—of radio stations, taking into account the influence of the Internet on their performance. To this end, a quantitative, descriptive study was carried out with data collected through a survey of Brazilian radio stations with an Internet presence. Data were analyzed using *Partial Least Squares Structural Equation Modeling*. According to the quantitative data from the survey, the most important antecedents were convergence, strategy, and interaction, and there is a relationship between the business model and the performance of radio stations with an Internet presence.

Keywords: Business Model, Hertzian Radio, Internet, Performance.

INTRODUCTION

This paper investigates the influence of the antecedents of the business model on the business performance of radio stations with an internet presence. For the research to be carried out, two scientific areas were brought into play. i) Administration, mainly with regard to the theoretical and conceptual contribution of the business model, and ii) Communication, which brings into the discussion the object of this study: radio with a presence on the Internet. Hertzian radio with an internet presence refers to traditional radio that also broadcasts its programming over the Internet.

With Management as a base, the *Web of Science (WoS)* database was searched for articles published in scientific journals and books discussing the emergence, trajectory, definition, and

components of the term business model to find the antecedents. The term is so popular that a quick search on Google using the expression "business model" returned 113,000,000 results in 0.97 seconds. The widespread use of the term suggests the importance of the business model. It is still often used in a generalized, superficial way and often reduced to the production of new ideas, proposing magical solutions for business, with a unilateral approach and greater weight on the financial aspect. The shallow, unsubstantiated discussion reflects the lack of understanding of the topic, the basis for its discussion, and the market's difficulty in understanding it (DaSilva & Trukman, 2014).

In the first phase, between 2000 and 2002, the articles referring to the business model were more technologically oriented, with the *e-business* context dominating, in which the business model is understood as a small fraction of the company, adopting an operational understanding. In the second phase, the prevailing view is that of the theoretical conception of the business model, which is defined and divided in terms of the components of the business (DaSilva & Trukman, 2014; Wirtz, Pistoia, Ulrich, & Göttel, 2015). In the third phase, scholars have stated that the technological, organizational, and strategic perspectives have become more complex, making it challenging to establish distinguished boundaries, with the business model becoming strategy-driven.

One aspect of the difference between scholars on the subject is the difficulty in defining the word. Forge (1993) was among the first to define it based on a functional approach; it sees the business model as a central process of organizations and includes in its conception the need to sell products. In turn, Amit and Zott (2010) understand the business model as the definition and description of a product or service architecture that meets consumer needs. Magretta (2002) states that the business model involves a management structure comprising tools relevant to the company's success.

A literature review was conducted with the intention of gaining a better understanding of the term business model, besides establishing a theoretical basis for this paper. In all, 36 authors were consulted in this search, and 84 categories of business model components were identified, finding dissonances and consonances in the theoretical construction of the term. Thirty-six different connotations were identified for the business model, coined in different contexts that emphasize strategic scenarios, the use of new technologies, change, innovations, and the digital economic environment. The components of the business model found in the review were organized, and it was found that only three of them were cited more than five times: strategy (eight), resources (ten), and value creation (22), which is why the antecedents of the business model were chosen to be considered in this research in the field of administration.

After identifying the antecedents of the business model from administration perspective, we moved on to the other scientific area covered by the research: Communication, which brought radio stations with a presence on the Internet as the object of reflection in the study. The investigation of the radio business model seems to attract little attention from communication researchers (Moreira, 2000). In order to verify the state of the art of radio studies covering the areas of Administration and Communication, a bibliographic search was carried out in the WoS database on January 11, 2020, using the descriptors "*business model*" and "*radio*" in the abstract, keyword, and title, from 1945 to 2019. The results indicated the existence of 79 articles; However, only nine were allocated to the field of Communication and four to

administration, with the remaining 56 distributed in other fields of knowledge. Specifically with regard to Communication, the articles discussed the history of radio in Spain in order to understand the current radio business model in the country (Bonet & Arboledas, 2011); the presentation of a holistic business model for the media (Brown, 2011); content management as a strategy (Fernandez-Sande, Rodriguez-Barba, & Rodriguez-Pallares, 2013), among others.

None of these studies identified proposals to build a theoretical framework for understanding and measuring the antecedents of the business model belonging to the two areas of this research, which indicates a theoretical gap to be explored.

No schematic proposal for a business model developed theoretically and specifically for radio was found in the literature review in the field of Communication. Therefore, this study sought to identify the antecedents of the business model by revisiting the history of radio, considering technological development and recent case studies. The antecedents of the business model from the field of Communication highlighted for treatment in this research were technology, convergence, and interaction. Lopez and Mustafá (2012) argue that radio was understood as a technological medium before being considered a means of communication. In turn, media convergence should be understood as a cultural movement in which people choose what they want to consume and how (Jenkins, 2009). Finally, interaction has been much discussed with the arrival of the online environment (Fragoso, 2001; Belloni, 2001; Quadros, 2013).

Elucidating the growth of scientific interest in business model issues in administration, the challenges faced by the area of Communication in the face of technological development, and the opportunities and propositions emerging in the cyber environment, this study presents the following research question:

What is the influence of the antecedents of value creation, people, strategy, technology, convergence, interaction, and people on the performance of the business model of radio stations with a presence on the Internet?

In these terms, the general objective of this study was to analyze the influence of the antecedents of the business model (value creation, people, technology, strategy, convergence, and interaction) on the performance of radio companies with a presence on the Internet.

In this environment of transformation, radio stations face the challenges of the digital convergence of networks, languages, and platforms (Becerra, 2015). The radio business model is centered on a value chain that moves mainly through advertising revenue. However, with the migration of advertising to different media, the radio industry is seeking another sustainable business model (Prata, 2016).

By measuring and understanding the theoretical aspects with the most significant influence on the performance of the radio business, the sector can create business forms that contain more assertive investments, which contribute to improving company management. This study contributes to the areas of Communication and Administration, raising new questions that can improve the dialog between these different fields of knowledge and pave the way for future research. In addition to this introduction, this article presents the theoretical framework that

underpins the arguments, the research methodology, the analysis of the results, and the final considerations.

THEORETICAL FRAMEWORK

Business Models: Approaches and Scope

The pioneering studies on business models are concentrated on tacit knowledge of the term, and its understanding has essentially been developed by the market (Lecocq, Demil, & Ventura, 2010). The notions put forward were aimed at qualifying the activities of the new *e-business* ventures. The concept of a business model became more attractive and significant than a strategy for explaining the forms of online commerce. At the beginning of the 1990s, scientific knowledge was characterized by the interest of academics who—addressing an audience of practitioners—sought to develop a conceptual definition to support the discussion on the *status of* the business model (Lecocq, Demil, & Ventura, 2010).

Considering a research period of 34 years, from 1975 to 2009, Zott, Amit, and Massa (2011) carried out an extensive literature review on business models. Extracting data from scientific journals in the EBSCO database, the authors examined the term through a variety of theoretical lenses. They concluded that business model research had been used to address or explain three phenomena: (1) *e-business* and the use of information technology in organizations; (2) strategic issues, such as value creation, competitive advantage, and performance; and (3) innovation and technology management. Although they were not in favor of the exclusivity of these categories, they believe that the categorization allows for the classification of the business model literature and have therefore used them as organizing principles for the article.

In the early 2000s, there was a breakthrough when theoretical discussions began to understand the business model as an independent concept, clearly separating it from strategy, organizational theory, and business planning (Seddon, Geoffrey, Freeman, & Shanks, 2004). The identification of the main elements that interact with the business model is guided by the idea that the development of a business model encompasses the commercial concept and enables its visual representation (Lecocq, Demil, & Ventura, 2010). Meirelles (2015) reveals that, from 2006 to 2010, efforts were made to systematize the general dimensions of a business model, with the aim of providing theoretical support for traditional models and those that have emerged in the internet environment. He believes that there was an effort to provide a theoretical basis for the proposed business model and to fill the existing theoretical gap.

Authors also differ in specifying what a business model is. Amit and Zott (2001) pointed out this lack of clarity in the meaning of the expression. They said that this promotes dispersion and represents a potential source of confusion, going against the grain of studies on business models. According to Pateli (2002), the term received various conceptualizations in the 1990s, especially when information technology and the Internet asserted their capacity and power to influence business *praxis*.

Given these definitions—and based on the work of Timmers (1998), Rappa (2004), Morris, Schindehutte, and Allen (2005), Amit and Zott (2010), Wirtz (2014) and Wirtz et al. (2015)—this study understands the business model as a schematic representation of a company's activities. It is somewhat stable but not rigid and hence can be adapted and adjusted to any changes in the market. Made up of components that vary according to the specifics of the

business and are previously established in strategic planning, the business model must also take into account the nuances of the sector in which it operates. The following topic defines and explains the components of the business model.

Business Model and its Components in the Field of Management

The controversies surrounding the business model are also present when it comes to defining its components. According to Rappa (2004), studying a business model without paying attention to its components favors particular aspects and runs the risk of losing the whole. It is, therefore, necessary to clarify and understand which components of the model are relevant in the literature, considering that the content of a business model is often expressed by subordinate components (Wirtz et al., 2015).

The components of the business model were compiled from the definitions of the various authors in the literature who have dealt with the subject in order to see which were the most cited elements in the 36 definitions of the authors analyzed. A total of 84 categories of components were identified and then organized in alphabetical order. After distributing the 84 components found in the definitions of the business model, only three of them were cited more than five times: strategy (eight), resources (ten), and value creation (22); hence, they were chosen for this study as the antecedents of the business model.

The first element, value creation, describes the products and services that create value for a certain segment of customers and is the reason why people choose a company over its competitors. The expectation of every business model is value creation; within a production chain, it can be understood as the organization's ability to develop relationships between its assets and create resources in order to offer value to the consumer. In other words, value creation is an organization's ability to generate benefits for the consumer (Zott, Amitt & Massa, 2011).

In radio, one of the ways of organizing the value chain comes from the continuous flow of programming, integrating the production of content; the organization of a program schedule, interspersed with advertising blocks; the provision of public utility services; the transmission and reception of the content produced and the services provided, distributed and consumed by listeners. A noble and strategic part of the radio value chain is the insertion of advertisements distributed directly during the commercial breaks and indirectly in the programs (Magnoni, 2007).

Thus, based on market research and the authors' investigative work, the creation of value is considered to be directly related to the consumption of the final product distributed by radio and consumed by the audience. Therefore, this study proposes the following hypothesis:

- H1: The creation of value influences the business model of radio with a presence on the Internet.

The second element considered in this work in the field of administration was resources.

In this work, the understanding of the "resources" component found in the Resource-Based View (RBV) theory was adopted for the consolidation of the radio business model, as it is assumed in most studies covering the subject (Nezameddin et al., 2018). [The term resource was broken down into technological resources, dealt with in the "technology" component,](#)

and human resources was considered the focus of this element. According to the RBV, a company is a set of potential resources with the main focus on its internal qualities, thereby providing it with a competitive advantage (Nezameddin et al., 2018). Barney and Hesterly (2007) advocate that a firm's resources and capabilities include all the attributes that can define and implement strategies.

In proposing to study the business model developed in the media industry, Wirtz (2014) stated that the business model, value chains, and competencies are critical to achieving competitive advantages in media companies. These three elements, combined with organizational assets, form the media service system, with people's competencies understood as essential and assets as complementary. Employees are a company's main asset and a key resource for business success, as their *know-how* combined with complementary skills is difficult to imitate. The combination of individual skills in a team can lead to better service creation and, therefore, competitive advantage (Wirtz, 2014). Zangiski, Lima, and Costa (2013) state that the most modern approaches to human resources start from the premise of workforce development and seek to improve the organization's individual and collective skills constantly. Investing in people is considered strategic, as they contribute to the formation of a firm's competitive advantage (Jugdev & Maathur, 2006).

When considering the context of radio with a presence on the Internet, it is clear that in the operation of a station and its content production and distribution process, people from various areas are needed: journalists, publicists, announcers, commentators, audio technicians, scriptwriters, broadcasters and professionals (Kischinhevsky, 2016). Based on Kischinhevsky (2016), Wirtz (2014, 2015), and Lopez, Resende, and Borges (2019), the second hypothesis of this research was constructed:

- H2: People influence the business model of radio with an internet presence.

The third element in the field of management considered in this work was strategy. Strategy has a substantial impact on organizational structure and performance, as it "refers to the determination of long-term goals, the basic objectives of the organization, the adoption of courses of action and the allocation of resources necessary to achieve these objectives" (Chandler, 1962, p. 13). As it is a multidimensional and situational concept, there is no consensus among authors when it comes to defining it (Hambrick, 1980).

The dominant understanding is that strategy is one of the components of the business model and is important for the development of the company (Chesbrough & Rosenbloom, 2002; Wirtz, 2014). A business model contains instructions on the combinations of factors of production through which the business strategy is implemented and on the choice of roles to be played by the corresponding actors (Mintzberg & Lampel, 1999). It explicitly involves suppliers or partners because the unit of strategic analysis is not done in isolation but in a network, combined with other components of the business model (Wirtz, 2014).

Bearing in mind that strategy is essential to the development of a business model, the third hypothesis was formulated:

- H3: Strategy influences the business model of radio stations with a presence on the Internet.

In the next topic, through the history of radio, it will be possible to identify the essential components of the business model originating from Communication.

Communication Perspectives on the Radio Business Model

In an attempt to identify and discuss the antecedents of the radio business model in the area of Communication and, by juxtaposing them with those of Management, to develop the hypothetical model of this research, we covered the history of radio and its business model from the early years, through the emergence of the Internet and into the second decade of the 2000s. In order to meet these objectives, we used Ferraretto's (2012) classification of radio into four phases: 1) artisanal, from the late 1920s to the second half of the 1930s; 2) commercial, from the early 1930s to the second half of the 1960s; 3) industrial, from the late 1950s to the early 21st century; 4) post-industrial, from the mid-1990s to the present day.

The initial phase, called artisanal and corresponding to the first half of the 20th century (Ferraretto, 2012), shows that radio emerged in Brazil as an enterprise of intellectuals and scientists, with a non-commercial bias, aimed mainly at disseminating culture, education and information (Ortriwano, 1985). The commercial phase of radio began in the 1930s and lasted until the second half of the 1960s (Jambeiro, 2003). In the subsequent industrial phase, with the arrival of television in the 1950s, radio's financial reality began to change. The main way of financing radio's business model was the sale of commercial space, i.e., advertising. Gradually, the advertising pie migrated to TV, and the new communication vehicle and radio had to change their configurations in order to remain in the market. In the post-industrial phase, which began in the 1990s, the development of internet technology permanently changed the way radio was made, creating different ways of financing the business. Digital technologies reinforced its historical characteristics, such as segmentation, mobility, interactivity, and international reach. A new market architecture has emerged, wherein new players use techniques to capture the consumer's attention (Lopez & Mustafá, 2012).

Although radio's greater presence on the Internet has changed the balance of power in the broadcasting industry (Kischinhevsky, 2013), radio's expansion into the World Wide Web and the variety of technological resources available does not necessarily guarantee the success of the business. It is necessary to find ways to monetize the medium in this new medium, studies that have been neglected (Prata, 2016).

In these terms, technology can be understood as an antecedent of the radio business model with a presence on the Internet due to the changes resulting from technological modifications, the impacts generated on the radio industry, production arrangements, changes in business structure, and the multiplicity of attempts to establish new business models in the digital environment. On the one hand, in the early 2000s, Quinn (2004) considered the convergence of print media with TV news and radio companies a trend. Media business models are made up of collective ownership of various media and partnership models, in which the news company acts as a news producer for media companies. On the other hand, interactivity has become much discussed with the arrival of the online environment. However, the interactive process predates it, with the first recorded forms of interactivity being attributed to radio (Brecht, 2005; Lopez & Mustafá, 2012).

Thus, the antecedents of the business model arising from Communication chosen to be dealt with in this research were technology, convergence, and interaction.

Technology is the first element of communication. Radio was configured as a technology long before it was understood as a means of communication (Lopez & Mustafá, 2012). Regarding the economic situation, radio has been conditioned by technological changes since its origins, expanding its business with the technological possibilities offered by the digital environment (Martínez-Costa & Prata, 2016).

This topic discusses radio in the context of the emergence of internet technology, a time when there was a profound reorganization of the players in the radio industry caused by the introduction of the new digital medium. According to Prata (2016), in the history of radio, there are two fundamental moments of transformation: the first, with the arrival of television in the 1950s; the second, with the incorporation of digital technologies, which forces it to change constantly. For Prata (2016), radio is the medium that most easily adapts to new technological scenarios; for Faus-Belau (2001), it was not uncommon for technology to come to radio's rescue. The emergence of the cyber environment has changed the way radio is made, expanding the possibilities for entrepreneurship on the web.

Based on technological development, the fourth hypothesis of this study was formulated as follows:

- H4: Technology influences the business model of radio stations with a presence on the Internet.

The second element of communication is convergence. Initially, convergence was developed on the basis of technological determinism. Over time, studies on the subject began to consider a broader perspective. Society was witnessing a process of convergence of all types of information on the same support or platform, and this process of transforming information into *bits* was reflected in four dimensions: 1) business, accentuating the processes of concentration and monopoly of the cultural industry, tending towards production on a scale; 2) technological dimension, when production processes are modified and renewed; 3) professional, in which journalists need to take on more tasks and develop new skills; 4) communicative process, which tends to transform the product itself with new languages, themes and rhetoric (Scolari, 2008).

The convergence process leads to new players entering the scene, changing the ways in which content is produced, accessed and distributed: (a) asymmetric digitization processes, business concentration, and unequal forms of access; (b) expansion of radio content distribution channels, with greater traffic speed; (c) formation of major *players* in the market, due to the formation of transmission networks; (d) new value chains in the production of symbolic goods, with large business groups remaining relevant; (e) new services that provide interaction with listeners, applications and *branded content* actions; (f) deepening of segmentation and market niches; (g) new business models and formats developed abroad (Ferraretto & Kischinhevsky, 2010).

In the same vein, Espada (2018) states that convergence is the main force of change affecting the media ecosystem; in line with this idea, the fifth hypothesis of the research is as follows:

- H5: Convergence influences the business model of radio with a presence on the Internet.

The third element influencing the radio business model from a communications perspective was interaction. The definition of this concept is diffuse and can be confused with interactivity and participation. Belloni (2001) states that the term interactivity has been used synonymously with interaction but differentiates between them: interactivity refers to the interaction between machine and man. Interaction, on the other hand, is understood as the reciprocal action between two or more subjects "which can be direct or indirect (mediated by some technical communication vehicle)" (p. 58). Herrera Damas (2005), when considering radio support, defines the term as a formula used by radio professionals to facilitate contact between transmitter and receiver and for listeners to give their opinions on the content of programs. Technology, associated with convergence, is considered to expand the forms of Interaction on the radio (Cebrián Herreros, 2007). With the proliferation of smartphones in the 2000s and the migration of radio stations to the Internet in the 1990s, radio has had to keep up with new technologies in order to meet the demands of the audience, which expects more interactive processes (Lopez & Mustafá, 2012).

Considering the importance of interaction channels for radio communication, the sixth hypothesis of the research was formulated:

- H6: Interaction influences the business model of radio with a presence on the Internet.

Radio's Business Model and Performance: Role of the Audience

The topic of the business model is commonly associated with the company's performance. An analysis of this issue leads to the inference that communication is a circular process carried out between different communities, with personalized content produced and distributed horizontally. Interaction takes place diachronically in the multimedia environment, and an active audience, with audience engagement, is one of the pillars of business success, as commercial breaks are marketed based on audience attention. The main objective of the media is to establish relationships of exchange with the public. Therefore, for this research study, it is considered that the performance of radio with a presence on the Internet should be understood by the number of listeners who turn on the radio and/or access the stations on the Internet, with engagement with the stations, in a convergent and expanded scenario, which relies on experimental forms to consolidate itself. Thus, the relationship between audience and performance is directly proportional, i.e., the larger the audience, the better the performance of radio companies and vice versa (Morris, Schindehutte, & Allen, 2005; Lambert & Davidson, 2013; Zott & Amit, 2007). In simple terms, audience is defined as the average number of people or households tuned in per minute to a program or time slot (Kantar Ibope Media, 2018). Bearing in mind the new configurations and roles that the audience has in the new media ecology in which radio is inserted (Scolari, 2013), it seems reasonable to consider the audience as an important element for radio's performance. Based on this, the seventh and final hypothesis was formulated as follows:

- H7: The business model, configured by its antecedents (value creation, people, technology, strategy, convergence, and interaction), influences the performance of radio stations with a presence on the Internet.

Research Model

The analytical model of this research is based on the assumption that investing in value creation, people, strategy, technology, convergence, and interaction influences the radio business model. Figure 1 shows the breakdown of the structural model.

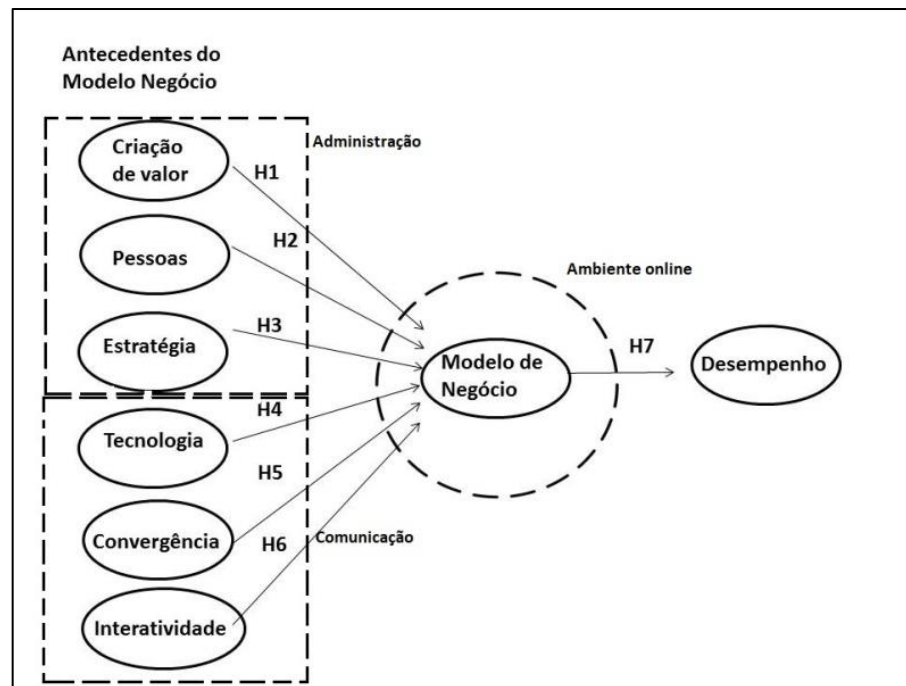


Figure 1: Hypothetical Research Model

Source: Research data

METHODOLOGY

This research was carried out in two parts. In the first part, the quantitative method was used to collect data through a survey using Structural Equation Modeling. A multidimensional questionnaire was created with a five-point interval measurement scale. In order to validate the questionnaire, it was sent for analysis to two specialists in the area of administration and two in the area of Communication. All of them had experience with radio and sound media and proposed the changes made to the instrument before it was applied. The questionnaire was drawn up in two sections called preliminary questions and basic research questions, respectively, involving the seven constructs of the theoretical model.

The second part of this study involves qualitative research with data triangulation. Ten people were interviewed, including professionals with experience in the radio market and researchers on the subject, in order to better understand the results found in the quantitative research. The data collected in the interviews was triangulated with the quantitative data to support the analysis of the results.

Regarding the universe or population for the quantitative survey, the best source of information would potentially be people who had a relationship with radio. As such, the survey population was made up of radio entrepreneurs (station owners), professionals in the field, journalists, broadcasters, producers, and researchers. Considering the survey population, it was determined that 400 questionnaires would be needed. A total of 404 questionnaires were collected, leaving 371 complete data records after eliminating *outliers*. The adequacy of the sample size was determined by analyzing the *Statistical Power* using *G*Power software*, version 3.1.9.4, achieving a statistical power of 100%. *Partial Least Squares Structural Equation Modeling* (PLS-SEM) was then used to process the data;

RESULTS OF THE MULTIVARIATE STATISTICAL ANALYSIS WITH STRUCTURAL EQUATION MODELING

The demographics of the questionnaire respondents can be summarized as follows: 18.06% of respondents belonged to radio stations in the countryside; 16.71% federal universities; 12.67% communications companies; 11.05% radios in the capital; 8.63% community radio; 7.82% private universities; 3.77% marketing companies; 3.50% education and training sector; 2.43% research and development; 1.62% state universities; 1.35% community university; 1.35% foundation and non-profit organizations; 1.62% state university; 1.08% consultancy firm and 0.81% educational radio.

With regard to the state of the Brazilian federation in which the respondents work, 46.90% are located in Minas Gerais; 12.94% in Rio Grande do Sul; 7.01% in São Paulo; 5.93% in Rio de Janeiro; 4.85% in Bahia; 4.04% in the Federal District; 2.16% in Santa Catarina and Alagoas; 1.62% in Paraná; 1.89% in Mato Grosso do Sul; 1.08% in Goiás, Mato Grosso, Pernambuco and Maranhão; 0.81% in Rondônia; 0.54% in Ceará, Pará, Espírito Santo and Tocantins; 0.27% in Rio Grande do Norte. There are also professionals from two southern cone countries: 0.54% in Argentina and 0.27% in Uruguay.

To analyze the relationships between the constructs, we used the *SmartPLS software*, version 3.2.9, configured according to the following parameters: *WeightingScheme* = *Path WeightingScheme*; *Data Metric* = *Mean 0, Var 1*; *Data Iterations* = 300; *AbortCriterion* = 1.0E-7 (i.e., 0.0000001); and *InitialWeights* = 1.0 (Hair Jr. et al., 2017, p. 91). The results obtained after running the *Partial Least Squares* (PLS) algorithm are displayed in the measurement model shown in Figure 1. The analysis of the measurement model must precede the analysis of the relationships between the constructs in the structural model. Table 1 shows the rules and parameters for evaluating the structural model and the measurement model with reflective indicators.

Table 1: Model Evaluation

Measurement Model (Reflective Indicator)
- Reliability: 1) Internal Consistency: <i>Composite Reliability</i> must be greater than 0.70 (in exploratory research, values of 0.60 to 0.70 are considered acceptable); and 2) Indicator Reliability: <i>Indicator Loadings</i> must be greater than 0.70. - Convergent validity: <i>Average Variance Extracted</i> must be greater than 0.50 - Discriminant Validity: 1) the average variance extracted from each latent construct must be greater than the highest squared correlation of the construct with any other latent construct (Fornell-Larcker Criterion); and 2) the loadings of an indicator must be greater than all its cross-loadings (<i>Cross Loadings</i>).
Structural Model
R^2 values of 0.75, 0.50, or 0.25 for endogenous latent constructs in the structural model can be described respectively as <i>substantial</i>, <i>moderate</i>, or <i>weak</i>. - Use of the <i>bootstrapping</i> algorithm to assess the significance of the structural path coefficients. The minimum number of <i>bootstrap</i> samples is 5,000, and the number of cases must be equal to the number of observations in the original sample. Critical <i>t-values</i> for a two-tailed test are 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.58 (significance level = 1%). - Predictive Relevance: use of <i>blindfolding</i> to cross-validate the redundancy measures for each construct. Verification of the number of valid observations, which must not be an integer multiple

of the omission distance D. Choice of D values between 5 and 10. Q values² greater than zero indicate that the exogenous constructs have predictive relevance for the endogenous construct under consideration.

Source: Adapted from *PLS-SEM Indeed a Silver Bullet* (Hair Jr., Ringle, & Sarstedt, 2011, p. 145).

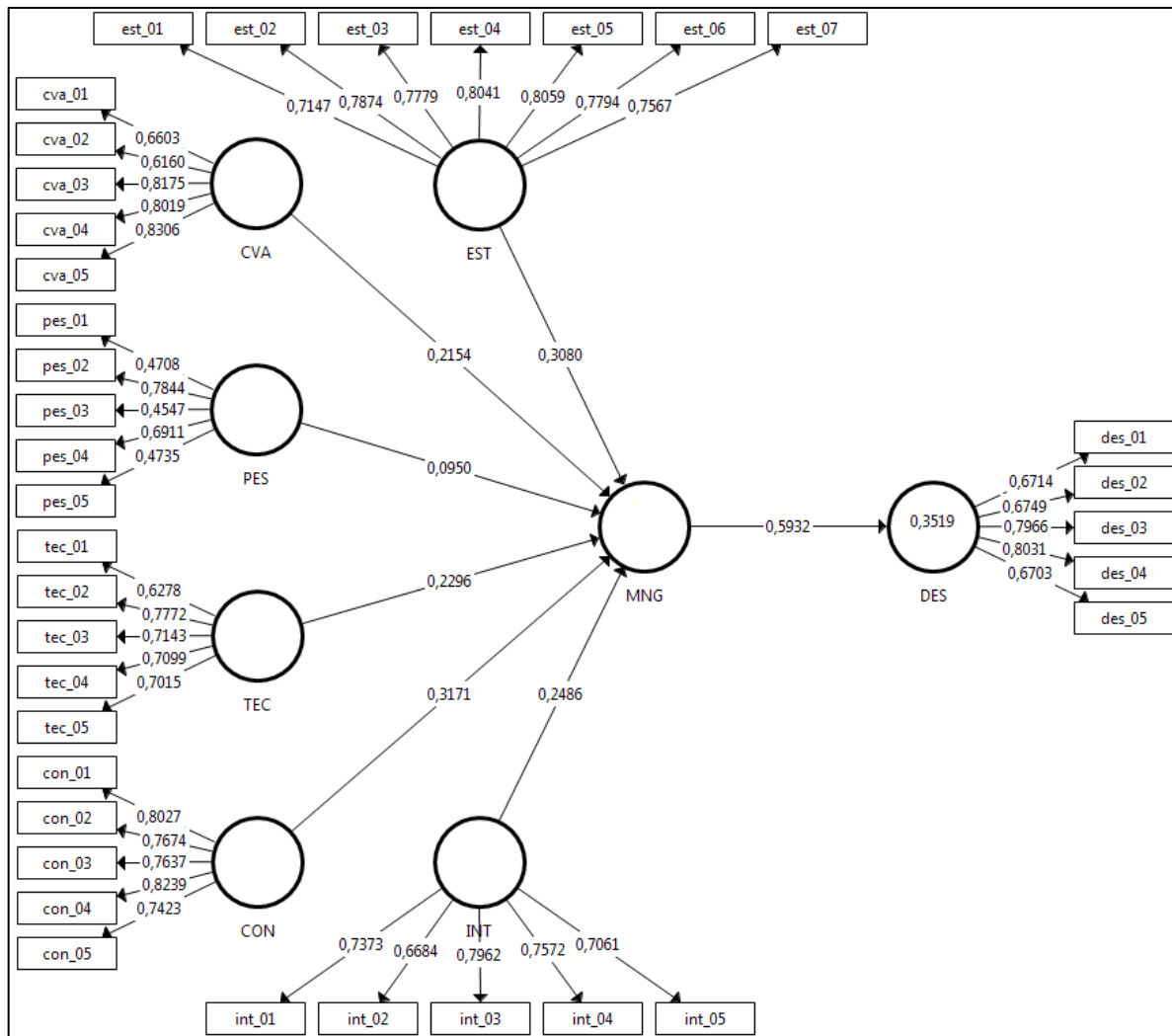


Figure 2: Results of the PLS algorithm

Source: Research data.

The first phase consists of examining the reliability and validity of the indicators and constructs based on certain criteria associated with the specification of the measurement model. The indicators had internal consistency since the measures reflecting composite reliability are greater than 0.70; i.e., the constructs are reliable. In the first stage of checking convergent validity and after analyzing the results, the indicators with values greater than 0.708 and those with external loadings between 0.40 and 0.70 were kept in the model, as their external loadings proved to be statistically significant.

The Average Variance Extracted (AVE) was examined to check for convergent validity. The Fornell-Larcker criterion showed that the variance extracted was more significant than the

variance shared in all cases. Valid and reliable estimates of the measurement model allow the structural model to be assessed.

The second phase of the PLS-SEM evaluation process involves establishing the predictive capacity and analyzing the relationships between the constructs. The significance results of the structural path coefficient were found to be significant with a certain probability of error (significance level). The critical values used for two-tailed tests are 1.65 (significance level = 10%, i.e., $p < 0.10$); 1.96 (significance level = 5%, i.e. $p < 0.05$); and 2.57 (significance level = 1%, i.e. $p < 0.01$).

The size of the effect f^2 is described respectively as small, medium, and large for values of 0.02, 0.15, and 0.35, with values below 0.02 indicating the non-existence of the effect - large effect means the good capacity to explain the relationship between each antecedent and the business model (TAB 1).

Table 1: Total Effect Significance Test

Constructs	Structural Path	T	Level of Significance	P	99% Confidence Interval
EST→ DES	0,1827	8,9021	***	0,0000	[0,1296 ; 0,2358]
EST→ MNG	0,3080	10,3825	***	0,0000	[0,2311 ; 0,3849]
CVA→ DES	0,1278	12,3462	***	0,0000	[0,1011 ; 0,1545]
CVA→ MNG	0,2154	12,7932	***	0,0000	[0,1719 ; 0,2589]
PES→ DES	0,0564	6,5747	***	0,0000	[0,0341 ; 0,0787]
PES→ MNG	0,0950	6,9886	***	0,0000	[0,0598 ; 0,1302]
TEC→ DES	0,1362	13,2419	***	0,0000	[0,1095 ; 0,1629]
TEC→ MNG	0,2296	17,2200	***	0,0000	[0,1952 ; 0,2640]
CON→ DES	0,1881	11,3301	***	0,0000	[0,1451 ; 0,2311]
CON→ MNG	0,3171	16,5759	***	0,0000	[0,2676 ; 0,3666]
INT→ DES	0,1475	10,0180	***	0,0000	[0,1094 ; 0,1856]
INT→ MNG	0,2486	13,1367	***	0,0000	[0,1997 ; 0,2975]
MNG→ DES	0,5932	16,3300	***	0,0000	[0,4992 ; 0,6872]

Note: NS = not significant. * $p < 0,01$. ** $p < 0,05$. * $p < 0,10$.**

Source: Research data, 2020.

The indirect effect on the "people" antecedent shows a smaller reduction compared to the other business model factors in the survey. There is also conceptual support. The focus is on explaining the dependent constructs, and the fundamental interest is that the coefficient of determination R^2 is high (Hair Jr. et al., 2017). For values of 0.75 (0.67); 0.50 (0.33) or 0.25 (0.19), the constructs can be described, respectively, as substantial, moderate, or weak. Another evaluation involves establishing the model's predictive capacity; to this end, Q^2 values above zero indicate predictive relevance. It can be said that the DES construct has a moderate R^2 . The values of R^2 and Q^2 are: $R^2 = 0.3519$; $Q^2 = 0.1672$; $R^2_{adjusted} = 0.3502$; $R^2_{analysis} = \text{Moderate}$. This concludes the analysis of the results using the PLS-SEM method, and the hypotheses expressed by the hypothetical model can be considered to be supported. Consequently, this indicates that the antecedents of the proposed business model are capable of explaining approximately 35% of the performance of the radio station Ziano with a presence on the Internet.

Analysis of Results

According to the results of the PLS algorithm and the direct effect significance test, all the dependencies were positive and statistically significant, so all the research hypotheses were supported.

Once the hypotheses had been proven, as described in the method, ten experts, including professionals from the market and academia, were interviewed so that the hypotheses could be better understood and explained by the research. Interviewee 1 is an audience consultant; Interviewee 2 is a radio researcher; Interviewee 3 is a journalism director; Interviewee 4 is a radio broadcaster. Interviewee 5 is a radio professor and entrepreneur. Interviewee 6 is a radio researcher; Interviewee 7 is a radio researcher; Interviewee 8 is a radio researcher; Interviewee 9 is an electrical engineer/broadcaster; and Interviewee 10 is a journalist/entrepreneur.

Therefore, H1: which suggests that value creation influences the business model of radio stations with an internet presence ($H1: CVA \rightarrow MNG = 0.2154; p < 0.01$)—was confirmed by this research. In radio, value is created for a specific audience by offering a service that is delivered through the production of content, journalistic material, weather and time reports, music, and radio documentaries, among others, organized through programming (Magnoni, 2007). For Interviewee 7, value creation is a subjective element but fundamental to the business model. Interviewee 6 says that creating value "is fundamental to any business model, as it consists of identifying and satisfying a need." He says that a station that can't create value is a meaningless radio station and, as a result, won't be able to generate an audience. Interviewee 9 corroborates Interviewee 6's thoughts when he says that many managers are still unprepared and ignore the fact that content generation is the future of radio. One of the ways to create value is to invest in developing new ideas and sharing information (Zott, Amit, & Massa, 2011).

H2: which assumes that people influence the business model of radio stations with an internet presence ($H2: PES \rightarrow MNG = 0.0950; p < 0.01$)—was confirmed. Wirtz (2014), considering the organizational scenario, stated that employees are the main asset and key resources for the success of the business. The author understands that the *know-how* of employees, coupled with their complementary skills, is something that is difficult to imitate and that combining individual skills in a team can lead to better service creation and, therefore, competitive advantage (Wirtz, 2014).

Although the theory and the interviewees defend the importance of people for organizations, the survey revealed that this is the antecedent with the least influence on the business model of radio stations with an internet presence. For interviewee 4, people are undoubtedly fundamental to radio, but he warns that once the company's standards and models have been defined, employees have less room to express their opinions and make changes. From a different point of view, Interviewee 1 attributes the low score for the hypothesis to a lack of information about how radio will behave on the digital medium. "The Internet gives one number when measuring the audience, Google comes along and gives another number, Ibope another, it's still very confusing. "So, people may feel unimportant to radio because of the lack of information." Iedema (2003) reminds us of the need to value intellectual capital, the *ethos* of participation, and the holistic relationship between people and their work. Zangiski, Lima, and

Costa (2013) understand that the most modern approaches to dealing with human resources are based on premises aimed at developing the workforce and constantly improving the organization's individual and collective skills.

H3 suggests that strategy influences the radio business model (H3: EST→ MNG = 0.3080; $p < 0.01$). Strategy has been considered an essential component of the business model (Timmers, 1998; Chesbrough & Rosenbloom, 2002; Morris, Schindehutte, & Allen, 2005). It has an impact on organizational performance and is substantial, as it determines the goals and objectives of the organization (Chandler, 1962). Over the years, radio has used a variety of strategies to get closer to and retain listeners, set up its programming, get closer to young audiences, diversify, and create different business models. Interviewee 7 says that to define a strategy is to set out a path to follow with a minimum of organization. Interviewee 7 thinks it's essential that the strategy understands that local radio becomes global with online support.

For Interviewee 9, due to the technological revolution experienced in the second decade of the 2000s, it is necessary to define the business strategy in order to remain relevant to the target segment. Interviewee 2, however, says that radio stations with a presence on the Internet still do not know how to exploit an important strategy: the notion of community, the idea of establishing communication among numerous individuals.

H4 deals with the influence of technology on the business model of radio stations with a presence on the Internet (H4: TEC→ MNG = 0.2296; $p < 0.01$). As has been studied, technological processes are part of the evolution of radio and have been fundamental to the medium's survival. When analyzing technology, Interviewee 5 says that it is possible to classify broadcasters into three groups of entrepreneurs: 1) those who see that they need to change and are changing and adapting to new realities; 2) others who see that they need to change, but don't know how to do it and 3) radio entrepreneurs who don't see it, who think that the Internet has to go, that Facebook was bad for radio. With regard to this last group of entrepreneurs, Interviewee 10 believes that "those who find it hardest to change are going to have serious problems keeping up."

The appropriation of new technologies has led radio to expand (Kischinhevsky, 2016) to the most diverse platforms such as smartphones, mp3 players, televisions, the Internet, and media that transmit high sound quality. Sharing the same perspective, Interviewee 9 says that with the wide variety of platforms available today, there is a tendency for the population's interest to turn to local and regional content.

H5 assumes that convergence influences the business model of Internet radio (H5: CON→ MNG = 0.3171; $p < 0.01$). It should be noted that this was the antecedent that most influenced the business model, which indicates that some attention is needed when thinking about convergence in radio with an Internet presence.

When analyzing convergence in the radio business model, Interviewee 6 said that the antecedent affects aspects such as "content, production model, marketing, commercialization, distribution strategy, definition of value, design with market partners and limits with the competition." For this interviewee, this changes the media landscape and, therefore, the

business. From the same point of view, Interviewee 5 says that convergence drives and expands the ways in which radio is captured and monetized.

H6 suggests the influence of interaction on the business model of radio with a presence on the Internet (H6: INT $\rightarrow$ MNG = 0.2486; $p < 0.01$). For Interviewee 7, interaction is a dialogical relationship between transmitter and receiver, which guarantees that listeners can express their opinions by participating in the programs. For Interviewee 7, interaction is fundamental on the web because the model of exchange between sender and receiver has merged into a single person who can fulfill both functions. For interviewee 10, there's no way that radio stations with a presence on the Internet can give up interaction or interactivity resources, as they are one of the greatest advances that new technologies have brought to radio. For interviewee 1, it's not radio that's changing, but the way radio is listened to.

H7 indicates a relationship between the business model and radio performance (H7: MNG $\rightarrow$ DES = 0.5932; $p < 0.01$). The association between these two themes has already been exposed by authors such as Morris, Schindehutte, and Allen (2005), Zotte and Amit (2007), and Lambert and Davidson (2013). This means that the antecedents (value creation, people, strategy, technology, convergence, and interaction) influence the radio business model, improving its performance by 0.5932. Note that performance is understood in this research as the number of listeners who turn on the radio and/or access the stations on the Internet. The relationship between audience and performance is directly proportional, i.e., the larger the audience, the better the performance of radio companies and vice versa.

FINAL CONSIDERATIONS

Based on the literature in the fields of Administration and Communication, the practical vision of the business model in radio, and the opinion of radio specialists, this paper argues that the antecedents of the business model (value creation, people, strategy, technology, convergence, and interaction) influence the business model of radio with a presence on the Internet, improving its performance.

The results of this study show that the three hypotheses from the field of Management were supported by the research, proving that the antecedents influence the business model of radio stations with a presence on the Internet. The most influential antecedent was strategy (0.3080), followed by value creation (0.2154) and People (0.0950).

The most important element (strategy) and the least important (people) stand out. The people element had a low numerical value, which, in statistical terms, means less influence on the performance of the radio business model. When the results of the quantitative survey were presented to the experts, there was a high degree of disagreement, as they all believe that people are important to the success of the business model. The interviewees attributed the low value of the hypothesis to the devaluation that communication professionals have suffered, receiving low salaries for exhausting working hours, and to the automation processes introduced by the market. As for strategy, it was considered by the interviewees to be the second most important antecedent in the business model of radio with an Internet presence. Thus, although researchers and market experts consider that, on a day-to-day basis, strategy is an important antecedent for the performance of the radio business model with an Internet

presence, strategic actions seem to be poorly planned within radio stations, taking place concurrently with daily practice, at the risk of giving the programs an amateurish look.

By analyzing the influences of the antecedents stemming from Communication (technology, convergence and interaction) on the business model of radio with a presence on the Internet, the three hypotheses can be confirmed. The antecedent with the greatest influence on Communication is convergence (0.3171), followed by interaction (0.2486) and technology (0.2296). Convergence had the greatest influence, considering the antecedents of the business model of both areas.

The research's contributions are theoretical and help clarify what the business model is and what antecedents contribute to the business model of radio stations with an Internet presence seeking better performance. In these terms, this research is a starting point for understanding the business model in radio, but it does not exhaust the subject, which requires further research that can produce broader knowledge and greater clarification of the subject. In order to deepen our understanding of the business model of radio with a presence on the Internet, future research must investigate other antecedents of the business model, such as innovation, organizational culture, relationship networks, management style, players in the radio business, and sources of revenue.

References

- Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22, 493.
- Barney, J. B., & Hesterly, W. S. (2007). *Strategic management and competitive advantage: Concepts*. Upper Saddle River: Prentice Hall.
- Becerra, M. (2015). *From concentration to convergence*. Buenos Aires: Paidós.
- Belloni, M. L. (2001). *Education and Distance*. Campinas: Autores Associados.
- Bonet, M., & Arboledas, L. (2011). The European Exception: historical evolution of Spanish Radio as a cultural industry. *Media International Australia*, 141, 38-48.
- Brown, R. (2011). "New" Holistic Mass Media Business Model. *Journal of Broadcasting & Electronic Media*, 55(4), 490-509.
- Cebrián Herreros, M. (2001). *Radio in the multimedia convergence*. Barcelona: Gedisa.
- Chandler, A. (1962). *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*. Boston: The MIT Press.
- Chesbrough, H., & Rosenbloom, S. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11(3), 529-555.
- DaSilva, C. M., & Trkman, P. (2014). Business model: what it is and what it is not. *Long Range Planning*, 47(6), 379-389.
- Espada, A. (2018). Nuevos modelos radiofónicos: las redes de podcast en Argentina: producción, distribución y comercialización de la radio ondemand. *Question*, 1(59), 1-20.

Faus-Belau, A. (2001). Radio in the changing environment of the 21st century. In Martínez-Costa, M. *Reinventar la radio: Actas de las Jornadas Internacionales de la Comunicación*. Pamplona: Enates, XV.

Fernandez-Sande, M., Rodriguez-Barba, D., & Rodriguez-Pallares, M. (2013). Content management as a strategic activity in broadcasting companies. Case studies about private radio networks in Spain. *El profesional de la información*, 22(2), 392-398.

Ferraretto, L.A (2012). A periodization proposal for the history of radio in Brazil. *Revista de Economia Política de las Tecnologías de la Información y de la Comunicación*, 14(2), 1-24.

Ferraretto, L. A.; Kichinhevsky, M. (2010). Radio and convergence: a political economy of communication approach. Proceedings of the *National Association of Graduate Programs in Communication*. Rio de Janeiro, Rio de Janeiro, Brazil, XIX.

Forge, S. (1993). Business Models for the Computer Industry for the next decade - When will the fastest eat the largest. *Futures*, 25(9), 923-948.

Hair Jr., J. F., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2 ed.). Thousand Oaks: Sage.

Hambrick, D. C. (1980). Operationalizing the Concept of Business-Level Strategy in Research. *Academy of Management Review*, 5(4), 567-575.

Herrera Damas, S. (2005). The before and now of listener participation in radio programs. *Sphera Publica - Revista de Ciencias Sociales y de la Comunicación*, 5, 293-307.

Iedema, R. (2003). *Discourse of post-bureaucratic organization*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

Jenkins, H. (2009). *Convergence culture*. São Paulo: Aleph.

Jambeiro, O. (2003). *Times of Vargas: radio and the control of information*. Salvador: Edufba.

Jugdev, K., & Mathur, G. (2006). Project management elements as strategic assets: preliminary findings. *Management Research News*, 29(10), 604-617.

Kantar Ibope Media (2018). *Radio Book - 2018*. Retrieved from https://www.kantaribopemedia.com/wp-content/uploads/2018/09/Book-de-R%C3%A1dio-2018_Final.pdf

Kischinhevsky, M. (2016). *Radio and social media: radio mediations and interactions on digital communication platforms*. Rio de Janeiro: Mauad X.

Lambert, S., & Davidson, R. (2013). Applications of the business model in studies of enterprise success, innovation and classification: an analysis of empirical research from 1996 to 2010. *European Management Journal*, 3, 668-681.

Lecocq, X., Demil, B., & Ventura, J. (2010). Business Models as a Research Program in Strategic Management: An Appraisal based on Lakatos. *M@n@gement*, 13(4), 214-225.

Lopez, D., & Mustafá, I. (2012). Radio research in Brazil: a preliminary mapping of doctoral theses on sound media. *Matrizes*, 6(1), 189-205.

Lopez, D., Resende, M., & Borges, D. (2019). Automated voiceover and music radio: first approximations. *Intercom-RBCC*, 42(1), 185-199.

Magretta, J. (2002). Why business models matter. *Harvard Business Review*, 80(5), 86-92.

Magnoni, A. F. (2007). An Initial Study of the Brazilian Digital Radio Value Chain. Proceedings of *the Brazilian Congress of Communication Sciences*. Santos, SP, Brazil, XXX. Retrieved from <http://www.intercom.org.br/papers/nacionais/2007/resumos/R0811-1.pdf>

Martínez-Costa, M. P., & Prata, N. (2016). Radio in search of its audience: towards diversified and multiplatform listening. *Proceedings of the Brazilian Congress of Communication Sciences*. São Paulo, SP, Brazil, XXXIX.

Meirelles, D. (2015). Business Model: definitions, controversies and a proposal for a theoretical and methodological foundation. Proceedings of *the ANPAD Meeting*. Belo Horizonte, MG, Brazil, XXXIX.

Mintzberg, H., & Lampel, J. (1999). Reflecting on the strategy process. *Sloan Management Review*, 40(3), 21-30.

Moreira, S. V. (2000). Radio in Brazil. Rio de Janeiro: Mil Palavras.

Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of Business Research*, 58(6), 726-735.

Nezameddin, F., Banafsheh, D., Seyyed, M., Sajadi, A., & Henten, P. (2018). Framework for business model with strategic innovation in ICT firms: The importance of information', *The Bottom Line*, 31(1), 16-41.

Ortriwano, G. (1985). *Information on the radio: power groups and the determination of content*. São Paulo, Summus.

Prata, N. (2016). New business models for radio. Proceedings of *the Congreso de la Sociedad Española de Periodismo*. Madrid, Spain, XXII.

Quadros, M. (2013). The listener on the radio: a historical-descriptive analysis of radio interactivity. *Anais do Encontro Nacional de História da Mídia*. Ouro Preto, MG, Brazil, 9°.

Quinn, S. (2004). An intersection of ideals: Journalism, profits, technology and convergence. *Convergence* 10(4), 109-123.

Rappa, M. (2004). The utility business model and the future of computing services. *IBM Systems Journal*, 43(1), 32-42.

Scolari, C. (2008). *Hypermediaciones: Elementos para una Teoría de la Comunicación Digital Interactiva*. Barcelona: Editorial Gedisa.

Scolari, C. (2103). Media Evolution: Emergence, Dominance, Survival, and Extinction in the Media Ecology. *International Journal of Communication*, 7, 1418-1441.

Seddon, P. B., Geoffrey, P. L., Freeman, P., & Shanks, G. (2004). The Case for Viewing Business Models as Abstractions on Strategy. *Communications of the Association for Information Systems* 13(25), 427-442.

Timmers, P. (1998). Business Models for Electronic Markets. *Journal of Electronic Markets* 8(2), 3-8.

Wirtz, B. W. (2014). Business Models, Value Chains and Competencies in Media Markets. A Service System Perspective, *Palavra Chave*, 17(4), 1041-1065.

Wirtz, B. W., Pistoia, A., Ullrich, S., & Göttel, V. (2015). Business models: origin, development and future research perspectives. *Long Range Planning*, 49, 1-19.

Zangiski, M. A. S. G., Lima, E. P., & Costa, S. E. G. (2013). Organizational competence building and development: Contributions to operations management. *International Journal of Production Economics*, 144(1), 76-89.

Zott, C., Amit, R., & Massa, L. (2011). The Business Model: recent developments and future research. *Journal of Management*, 37(4), 1019-1042.