

## SECTORAL INNOVATION SYSTEM: THE PUBLISHING INDUSTRY IN BRAZIL

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### ABSTRACT

The objective of this exploratory research paper is to describe the path of the publishing industry innovation system in Brazil, starting from bibliographic research and content analysis of secondary data available about the industry and its actors. It also provides an analysis of the current state of the industry, the situation of the dominant paradigm of printed communications, the possibilities for disruption and the prospect of a new paradigm based on digital communication, within the boundaries of the digital communication presented. The expected outcome is a reference framework as a contribution for future research, as well as collaboration for a greater understanding of the current state and prospects for the industry within the dimension of the sectoral innovation system.

**Key words:** publishing industry, sectoral innovation system, technological paradigm.

### INTRODUCTION

The publishing industry in Brazil is characterized as being part of a broader and more complex value chain, namely the paper, printing and packaging industries. Although there are various associations, groups, and sectoral chambers specifically for publishers, most of the operations are related to other actors in the value chain, mainly those focused on capital investments and innovations. In this scenario, the analysis of an innovation system for the publishing industry will involve these other actors at least at the level of interdependence. One can therefore visualize the integration of this

value chain to which the publishing industry belongs and that will be fully affected by innovations coming from any of such actors.

To start with, the industry exists within a paradigm in which the dominant logic is focused on printed communication. Despite major technological advances in digital media, especially in the United States, progress in this area in Brazil is still limited. Furthermore, the prevailing culture in the country that gives greater credibility to printed publications - in part because of the physical nature of printed matter against the virtual nature of digital media - is compounded by the resistance of major market players - namely large publishers, printers and paper manufacturers - to digital publication formats. Associated with this context, the country's institutional structure clearly favours printed publications, as evidenced for example by the taxation of paper, which is exempt from taxes such as ICMS and IPI, thus providing significant advantages to the value chain as a whole.

However, the maturity of the current paradigm in the industry is evidence that a new paradigm is emerging. Incremental innovations implemented over the past few years range from improvements in production processes and chain integration to media management actions. But two main innovation groups stand out: the consolidation of digital communication, which in the scope of this study includes e-books and audiobooks as the most relevant media, followed by the advance in legislation on job safety and sustainability that will inevitably require actors to promote major adjustments in their respective fields of operations. In the first group, the shift from printed communication to digital communication which, albeit consolidated within the technological realm is not widespread, will represent a drastic disruption in the industry, ultimately leading to the fall of the printed publication paradigm and the rise of the digital publication paradigm, which will become the new dominant paradigm. Actors and agents in the industry and in the value chain itself will have to adapt to this new paradigm, but not in isolation. Broad institutional adaptation will be required from a systemic perspective, since many aspects will be heavily impacted, such as tax structures, logistics, human qualification, and paper certification among others.

The second group, which focuses on job safety and sustainability, will experience a more diversified adjustment. Job safety applies more strongly to large industrial activities in the value chain, especially in the paper and printing industries. The new paths to be followed by these actors, which are more resistant to a shift of the current paradigm, are still uncertain. However, a new and comprehensive opportunity for sustainability is emerging, given the likely reduction of the social and environmental impact of a possible digital communication paradigm. However, it is premature to speculate about these scenarios, as printed publications will certainly enjoy a relatively long period of existence in the country.

This scenario leads to the objective of this exploratory research paper, which is to describe the path of the publishing industry innovation system in Brazil, starting from bibliographic research and content analysis of secondary data available about the industry and its actors. An analysis of the current state of the industry is presented, together with the situation of the dominant printed communication paradigm, the possibilities for a shift in said paradigm, and the prospect of a new paradigm based on digital communication, within the boundaries of the digital communication presented. This study also intends to provide a reference framework for future research and contribute to a greater understanding of the current state and prospects for the industry within the dimension of the sectoral innovation system.

## THEORETICAL REFERENCE FRAMEWORK

A set of concepts closely linked to the objective of the study, such as the definitions of innovation, types of innovation and the innovation system is presented below, followed by the research methodology.

### Innovation

With respect to the term innovation, understanding its importance to the growth and development of the nation is perhaps as important as understanding the concept itself. In this regard, this article recognizes that innovation is the 'lung' of the development of enterprises, thus influencing their social and economic relations, displacing the previously existing steady state and leading to a collective improvement in favour of development (SCHUMPETER, 1997).

The definition of innovation can be understood as the intellectual capacity to materialize a set of creativity, knowledge and skills, with the aim of generating an incremental advance in the status quo (FILHO, 2013), which enables value addition, thus extending the economic life of the company (MOROCOCHI, 1994). Influences the production system of the entity, allowing greater efficiency gains and boosting creative destruction in order to replace old consumption habits with new ones (SCHUMPETER, 1997).

As for types of innovations, there is no homogeneity of concepts. The summary table below shows the main types of innovation based on the perceptions of Schumpeter (1997) and those defined by the Organization for Economic Cooperation and Development (Oslo Manual, 1997).

*Table 1: Types of Innovation*

SCHUMPETER, 1997	Oslo Manual, 2007
<b>Introduction of a new good:</b> a product which consumers are not yet familiar with - or a new quality of a good.	<b>Product Innovation:</b> is characterized by a significant change in the functional characteristics of products (goods and services). It applies to both totally new products and to significant improvement in existing ones. Examples of product innovation (Manufactured Goods) include: mobile phones, digital cameras, disposable diapers, personal computers, flash drives, and dual fuel engines. As for services, innovations include ATM banking services, online sales over the Internet, and reverse logistics system for packaging waste.
<b>Introduction of a new production method:</b> a method that has not yet been tested through experience in the corresponding branch of the manufacturing industry and which by no means needs to be based on a new scientific discovery and may also consist of a new way of handling a commodity commercially.	<b>Process innovation:</b> occurs when production and delivery methods undergo significant changes so as to incorporate new features. Examples of process innovation include assembly lines, computer-aided manufacturing (CAM), and new predictive maintenance methods.
<b>Opening of a new market:</b> a market into	<b>Marketing Innovation:</b> includes the use of new

SCHUMPETER, 1997	Oslo Manual, 2007
which the particular branch of the manufacturing industry of the country in question has not yet entered, whether or not this market has existed before.	methods involving product design, market behavior analysis, product techniques, customer loyalty, and sales pricing methods among others. Examples of marketing innovations are rewards cards, exhibition of concept cars, products to generate brand image, and the use of social media on the Internet.
<b>Conquest of a new source of supply:</b> supply of raw materials or semi-manufactured goods, again, irrespective of whether this source already existed or had to be created.	<b>Organizational innovation:</b> occurs when new organizational methods are implemented. It can be obtained in any area of business management such as business model, organizational structure, financial management, and personnel training and performance management. Examples of organizational innovation include activity-based costing (ABC), franchise systems, Balanced Scorecard (BSC), and the leadership matrix system.
<b>Establishment of a new organization:</b> implementation of any industry, such as the creation of a monopoly position (for example, through trustification) or disruption of a monopoly position.	

*Source: Adapted by the authors from the Oslo Manual (2007); Schumpeter (1997).*

The introduction of innovation concepts, their importance to the country's development and types of innovation will be followed by the definitions of innovation systems, innovation processes, sectoral innovation system and technological trajectory.

### **Innovation Systems**

The study of an innovation system is a comprehensive study of both the evolutionary mechanisms of the economy that are directly or indirectly linked to the innovation, as well as of the structure of the use of resources and knowledge that does not yet produce new products and services but produces new knowledge and capabilities, with the consequent generation of new goods and services. Thus, innovation happens through relationships of cooperation, technology transfer or more complex relations involving company behaviour and other categories of analysis such as culture, social context, institutional and organizational framework, infrastructure, and distribution of scientific knowledge (SMITH, 2000). The innovation system based on the classical theory of Friedrich (1956) indicates that the agents involved in the innovation process use existing resources and knowledge, which they transform into new products through a set of sequence of activities (linear) or specific projects (fixed stages) (SMITH, 2000).

The innovation process involves complex relationships between organizations and the environments in which they operate, where broader factors such as socio-cultural context, institutional and organizational framework, infrastructure, production and distribution of scientific knowledge affect organizational behaviour. Innovation is the central element of competitiveness and therefore should be addressed systemically and focused on sustaining macroeconomic growth (KEITH, 2000; KASTELLE, POTS, DODGSON, 2009).

The same authors discuss the need to understand that the Theory of Innovation Systems explores how innovative agents use the available resources to produce new knowledge in order to add

greater economic value to the organization. Therefore, innovation is understood as the cause of economic development. The innovation system can be subdivided into the National Innovation System (NIS), which is the broadest level where firms within the system are the primary drivers of innovation; the Regional Innovation System (RIS), which exists according to the differences between innovation systems within a nation; and the Sectoral Innovation System (SIS), which is explained by the difference in institutional consistency across economic sectors within a nation. The question then arises of how innovation systems evolve and interact. To help understand the innovation system in the Brazilian publishing industry, the main actors and their contributions to the history of the publishing market as well as prospects for the development of this sector will be presented after the section on research methodology.

A better understanding of the innovation system requires delving into the history of the sector in question, especially as regards its technological base. Technological revolution occurs when there is a drastic change or development in the industry's technological system. These developments entail a set of new technical industries and principles that did not exist before and enable invigorating and renewing all production practices. However, this evolution not only takes approximately two to three decades to occur, but it also faces strong resistance on the part of institutional leaders and stakeholders, thus requiring a long time for the economic sector to absorb these changes (PEREZ, 2004; KUHN, 2011).

Since this phenomenon affects the entire system and social structure, Perez (2004) defines it as "long waves". It is the result of a successive coupling of two spheres - the techno-economic sphere and the social-industrial sphere, in search of a good alignment between them so as to ensure economic prosperity. An indispensable element for that to occur is the development of both incremental innovation (from a process of organizational improvements upon products and processes, whose purpose is to increase the capture of profits) and radical innovation (which is related directly to a disruption in the economy). The disruption then occurs and the product gradually consolidates a position in the market. From then on, there is a period of successive incremental improvements related to production efficiency, following the trajectory of the product and accumulating technology, until the product finally reaches maturity, which is when it loses its dynamism and profitability. To better illustrate this phenomenon, the chart showing the evolution of the technological trajectory is presented below.

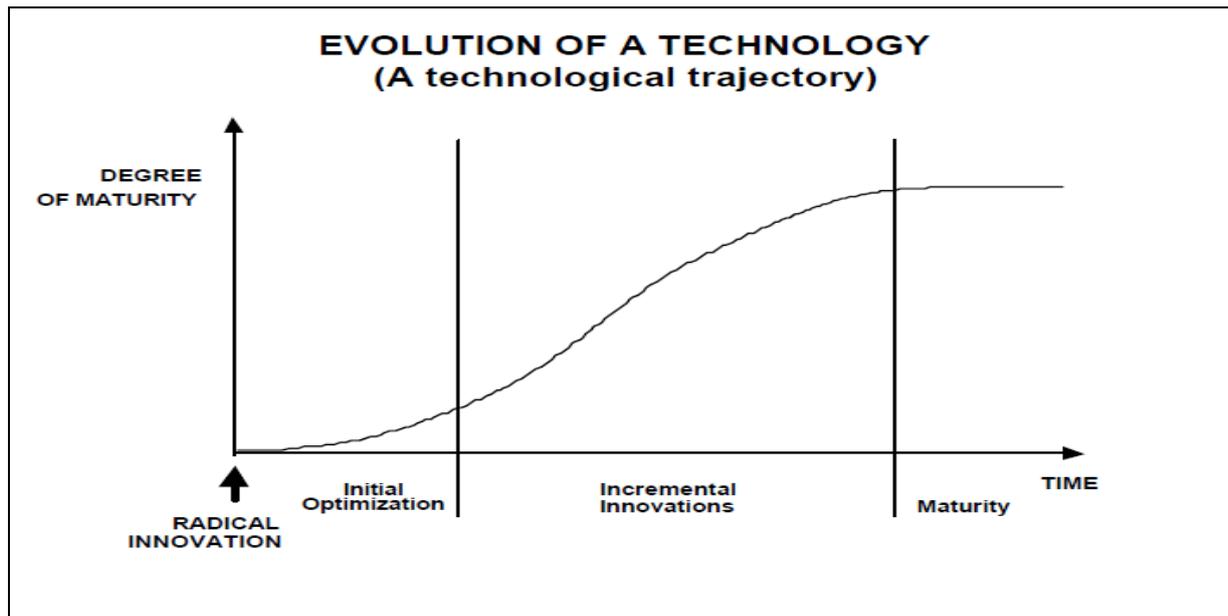


Figure 1: Evolution of a Technology, Source: Perez (2004)

Therefore, strengthening technological development requires a robust technological system based on the development of services such as the required infrastructure, specialized suppliers, distributors, and maintenance services. It seeks "cultural" adaptation to the logic of the interconnected technologies involved among engineers, sales managers and service staff, consumers, etc. and favors the setting up of institutional facilitators, namely rules and regulations, specialized training and education. It prioritizes the generation of a set of new technology systems that grow and spread in the productive sphere; improves practices and adapts to new technologies (modernization); and disseminates a general set of principles by replacing old ideas established in common sense (Perez, 2004).

Now the concepts of innovation, types of innovation, innovation systems, innovation processes, incremental and radical innovations and, finally, technological trajectory have been understood, the research methodology used to achieve the overall objective of the paper is discussed below.

## RESEARCH METHODOLOGY

For the construction of knowledge, the research should provide a level of order that allows readers a better understanding of the text. The methodology required to develop this research involved an exploratory, descriptive and bibliographic study, which is presented in two stages. The first stage addresses the scientific characterization and the second the operationalization of the research.

### Scientific Characterization

With respect to its purpose, this research is characterized as exploratory and descriptive. For Beuren (2006), exploratory research occurs when there is limited knowledge about the phenomenon under study and researchers seek to understand the subject in greater depth and help to clarify questions on the subject that are superficially addressed. Descriptive research, in turn, aims to report, identify, compare, analyze, and classify research data. As for its means, this research has a bibliographic characteristic. Again, for Beuren (2006), bibliographic research entails surveying all materials already produced and published on a particular subject for the analysis, interpretation and organization of

ideas, with a view to finding the best possible solution to the problem under study. Therefore, the key question that this research needs to answer is "How has the Publishing Industry Innovation System in Brazil developed, what is its current state and what are its prospects?"

### **Operationalization of the Research**

To meet the overall objective of the research - "to describe the trajectory of the publishing industry innovation system in Brazil", the authors' priority was to identify and list the actors involved in the publishing industry innovation system, examine the development and current state of the publishing industry innovation system and finally present prospects for the sectoral innovation system. In this regard, secondary data were surveyed in bibliographic sources and contents relating to the publishing industry in Brazil, as well as innovations in the publishing industry, supply chains, prospects for the publishing industry, the organization of the industry and the sectoral innovation system.

### **FINDINGS – THE PUBLISHING INDUSTRY INNOVATION SYSTEM: ACTORS AND PATH OF THE PUBLISHING INDUSTRY**

The publishing industry as a whole is facing some scenarios that will profoundly influence the way its participants operate in the country. The rise of new technologies such as e-books and audiobooks is likely to progress further, and actions focused on sustainability are becoming increasingly demanded by users of publishing products, as are actions by the Labor Ministry, especially regarding the enforcement of Regulation 12 on the protection of machinery and equipment, which will require significant investments in the prevention of occupational accidents, ranging from protective equipment to training and education of employees on safe work practices. In view of this situation, this analysis will be divided into two parts: the first on digital and multimedia technologies and the second on sustainability standards and regulations impacting the industry. In both parts, innovation is the primary way to enforce these requirements. Therefore, the analysis will be based on the sectoral innovation system relevant to the publishing industry.

The sectoral innovation system consists of a set of actors with distinct functions, performing commercial and non-commercial operations for the generation, adoption and use of (new and existing) technologies aimed at the development, production and use of products that belong to the same industry, which may be formatted as social networks with different beliefs, skills and behaviours (MALERBA, 1999). Well, the interaction of heterogeneous agents characterized in the author's definition refers to the actors and institutions that make up the publishing industry innovation system. Initially, both producers and consumers are directly involved in a technological breakthrough of potentially broad reach within the industry, specifically with regard to e-books and audiobooks. This requires reviewing both the economic and scientific evolutionary assumptions and concepts to which they are subject.

The dynamics of evolutionary economics entails a process of technological revolution that causes the shift of a current technological paradigm to a new one. For Perez (2004), technological revolution represents a "drastic change in the technological system rooted in the powerfully dynamic nature of each of those great waves of new technologies as well as their capacity to profoundly modify the world around them." The same author goes on to say that "technological revolutions change the 'common sense' criteria for engineering and business behaviour across the board." One can observe the existence of a direct relationship between technological revolution and

science, in the sense that the latter is the sphere in which the first is developed. Therefore, a paradigmatic revolution in the technological sphere is preceded by - or at least concomitant to - a scientific revolution. According to Kuhn (2011), "the transition to a new paradigm is a scientific revolution". Although Kuhn's perspective is eminently that of science, an analogy to Perez's context is valid in the sense that a shift is observed in a current paradigm to a new one. Perez, in turn, adopts the concept of evolutionary economics of Schumpeter (1985), which addresses incremental advances and drastic disruptions as well as paradigm shifts within the economic cycle.

Bringing the context of paradigm shifts to the publishing industry, it can be said that e-books and audiobooks represent potential shifts in paradigms. One must add to this scenario an institutional pressure of "economic, technological and political nature that is leading to changes in the publishing industry" (GOLDEN; ODDONE, 2013). Carrenho (2011) offers a more assertive view of the matter, by stating that "publication in digital format is not an option; it is a matter of survival," thus reinforcing his argument with the increase in revenues from e-books for major American publishers, which in 2008 represented 1%, in 2009, 3%, and in 2010, 9% of their total revenue. However, this is an economic perspective. It indicates, nonetheless, that a change in habits has apparently begun, which may characterize a new cultural pattern in relation to the activity of reading. In Brazil, this position is different. According to the latest edition of the survey "Portraits of Reading in Brazil", conducted by Instituto Pró-Livro (2011) in 2007, 3% of the respondents used digital books as reading material. In 2011, this number rose to 4%, still a very timid behaviour against the backdrop of the revenues of American publishers in an even shorter period. A similar evolution applies to audiobooks, which in 2007 did not score in the survey and in 2011 reached 2% of the sample. It is undeniable, however, that from the technological perspective both e-books and audiobooks represent a potential innovation prior to a significant change, which can spread over several spheres of reading such as leisure, education, research, and teaching among others. However, the paradigm shift has not happened yet.

The publishing industry is situated in a more extensive supply chain, also covering the role of paper, printing and packaging. A multi-sectoral discussion is under way in this chain about new directions for printed communication in Brazil. In April 2104, the Federation of Industries of the State of São Paulo (FIESP) promoted a broad discussion on the progress of digital communication, in which the main question was whether digital communication will represent the end of printed communication. The conclusions were that printed media, particularly newspapers, enjoy credibility among readers and that printed communication will continue to exist to the same extent as the "strength of the creativity of those working in the publishing market and the investments made to ensure high-quality journalism"; and that "the Internet is not the root of all problems facing the printing industry" (COPAGREM, 2014). FIESP represents the interests of a specific group within society. It can be said that in institutional terms it is an actor within a production system and that, more specifically, COPAGREM represents the Federation within a cluster of paper, printing and packaging companies.

It should be pointed out that a cluster is most of the time a geographic concentration of companies interrelated via specialized suppliers, service providers, and partnerships with specific institutions such as universities, research centers, regulatory agencies, and trade associations. These organizations can cooperate with one another by sharing technology. In general, a cluster can be

understood as a network that provides assistance in the development of a company in one or more industries (PORTER, 1999).

As a result, one must consider the specific interests of this cluster in the scenario of a larger production system. But there is no denying that the debates promoted stem from institutions deeply rooted in the sector discussed herein, as well as from the economic and marketing relevance of their actors. Thus, the product of the debate originated in FIESP can significantly influence the entire national production system and, by extension, the publishing industry innovation system.

To continue the analysis of the sectoral innovation, a brief foray into some institutional aspects of the publishing industry is required. Initially, its actors are not different from those in other sectors. The innovation process goes through the same government agents such as the Ministry of Development, Industry and Foreign Trade, the National Bank for Economic and Social Development (BNDES) and the Studies and Projects Financing Agency (FINEP), linked to the Ministry of Science, Technology and Innovation, among others. Even with the existence of groups, associations or sectoral chambers related to some agents, as in the aforementioned case of FIESP, there is no big difference in how an idea or invention makes its way to becoming an innovation, particularly with regard to financial incentives or resources. However, a very important issue must be raised: culture as an institution. Let us start with the applicable concepts. According to Strachman and Santos de Deus (2005), institutions are defined as "rules and patterns of behaviour or interaction among people verified in a society, which acquire some stability and are repeated even if for a short period of time" and "establish and constrain possible choices and behaviours of individuals." In the reasoning of the authors, the process of learning and the stock of knowledge are some of the most important foundations of the dynamics of modern economies, creating a causal relationship with transformations and innovations. At this point, culture has a strong influence in the context of the publishing industry, more specifically in the issue of digital and multimedia technologies. Both e-books and audiobooks, which are examples of potential innovations for a paradigmatic revolution in the publishing industry, are proving to be promising, but tied to cultural conventions that moderate their evolution. Still according to Strachman and Santos de Deus (2005), there is a ceremonial behaviour in relation to the adoption of the technologies mentioned herein, since society at large seems to be at a turning point as to the format of reading, with a prevalence of printed communication as indicated by the aforementioned survey "Portraits of Reading in Brazil". Thus, for as long as this position is maintained, there will hardly be a projection like the one shown by the financial progression of American publishers. There is still resistance from sectoral agents due to their consolidated positions under the prevailing paradigm, since a shift of this paradigm would be costly and potentially unfeasible for some actors. Associated with this scenario is the difficulty in obtaining technologies, since there is no, for example, Internet bandwidth uniformity across the country and a significant portion of the population has no access to information about products, in addition to facing price barriers. In addition, to close the circle, there is the very limitation of the teacher training structure, particularly in public schools, which disseminates moderately the possibility of using incremental technologies in education.

The second part of this study is dedicated to the analysis of sustainability standards and regulations impacting the industry. At this point, two main aspects stand out. The first is inherent in the regulatory action for job safety, and the second in the certification of the origin of paper for printed communication. The Committee of the Paper, Printing and Packaging Supply Chain (COPAGREM),

linked to FIESP, which represents an association of producers within the production chain involving the publishing industry, strives to "develop references, knowledge and alignment as regards environmental issues directly and indirectly related to the universe of the printing industry" (COPAGREM, 2014). As a result, it has listed six main topics on the issue of sustainability, which will somehow impact society. They are: (i) reverse logistics/selective waste collection; (ii) sustainable development; (iii) water/pollution; (iv) supply of resources to society; (v) education/individual and shared responsibility of consumers; and (vi) social inclusion. The topics are wide-ranging, but the corresponding actions are still incipient. The process that seeks the review of government regulation on job safety standards are at a more advanced stage, especially Regulation 12 (NR-12 on the safe use of machinery and equipment); Regulation 13 (NR-13 on boilers, pressure vessels and piping); NR-15 (on unhealthy activities and operations); NR-18 (on the environment in construction); and NR-24 (on health and comfort in the workplace). The number of actions relating to NR-12 increased by more than 400% in 2013 against 2010 (COPAGREM, 2014). In terms of job safety, these regulations are clearly in line with actions geared towards the sustainability of the supply chain, since they directly impact the economic, social and environmental aspects of the sustainability tripod. But the industry is looking for more. If on the one hand there is concern about penalties for non-compliance, on the other there is the effort to modernize the relevant legislation, which will, in turn, require adjustments in the production process that can lead to noncompliance or make adaptation unfeasible.

But the aspect of sustainability is much broader. According to Cunha and Hasenclever (2011), modern greening is that whose studies "emphasize the importance of technological innovation for economic development and ecological sustainability, including the institutional context and processes within a scenario in which the correct focus is on the co-evolution of technical and institutional innovations and on the transition process for achieving systemic change through more sustainable models of production and consumption" (BERKHOUT, 2002; KEMP, ROTMANS, 2010; MARKAD; RAVEN; TRUFFER, 2012; SAFARZYNSKA; FRENKEN, VAN DEN BERGH, 2012; apud MENDONÇA; CUNHA; NASCIMENTO, 2013, p.3). Also related to regulation, more specifically to certification, is the provision of the Forest Stewardship Council (FSC). The FSC has developed a forest certification system for the sustainable management of forest-related activities. According to the FSC, "Certification is a voluntary process, in which a forest operation is evaluated by an independent organization, the certification body, which verifies if such operation is found to be in compliance with social, economic and environmental principles and criteria set by the FSC." (FSC, 2014). According to Sartori and Bacha (2007) "Forest certification is the process by which one verifies if a forest, whether planted or native, has been and is being managed in accordance with pre-established environmental, economic and social standards. The process must certify, in a reliable and independent manner, the adjustment specified by the accrediting body, whose standards are based on three pillars: environmentally friendly, economically viable and socially beneficial." In the same study the authors indicate that FSC certification in Brazil has risen from 100,000 hectares of forest in 1995 to 3.5 million hectares in 2005. This trend indicates not only that paper consumers are progressively demanding that the product should be subject to appropriate sustainable treatment processes but also that paper producers are resorting to those sources of raw materials that are processed according to sustainable management standards. This characterizes the technical and institutional co-evolution aimed at systemic changes, as recommended by Cunha and Hasenclever (2011).

The idea that printed communication still has a long way to go towards a paradigm shift to digital media prevails in this dichotomous analysis. Regardless of how revolutionary the e-book and the audiobook may be, some time will be required for them to be strong enough to become the dominant paradigm in Brazil. Public policies themselves (or lack thereof) favour such a scenario. According to Carvalho (2006), "... [the school teaches to read] and [the library is the space conducive to the exercise of reading] ... lack coordinating public policies and eventually become misguided and fragmented." Likewise, associations, agents and actors in the production chain to which the publishing industry is linked struggle to preserve the status quo of printed communication, advocating causes that range from the current tax structure for paper (IPI and ICMS exemption) to "campaigns to encourage the use of culture vouchers provided by the Ministry of Culture for the consumption of printed magazines" (COPAGREM, 2014). Completing this cycle is the precaution against a possible loss of competitiveness by the industry, with the potential risk resulting from an adaptation to a production means that is different from that of recent decades.

Regarding sustainability, the scenario seems to be more linear. Actions in favour of comprehensive measures aimed at job safety, which by extension include the sustainability tripod, are among the industry's priorities. Likewise, the FSC or other similar certification for production standards that promote sustainable forestry have boasted significant and consistent increases in recent years, thus showing the incorporation of values ecologically founded on the domains of balance between production and consumption. However, it is necessary to include at this point a consideration on the dominant paradigm, namely that of printed communication. As seen, the situation indicates that this paradigm is likely to prevail for yet some time to come. But it is undeniable that the consolidation of digital technologies that enable digital media publications might eventually break this paradigm through some drastic innovation. Digital technology is consolidated but not widespread in the publishing industry or in the value chain to which it belongs. Some possible reasons have been given. Thus, digital technology through media such as e-books and the audiobooks may represent the rise of a new digital communication paradigm, which would end the cycle of shift in the prevailing paradigm, provided that it is supported by appropriate institutional permeability throughout the industry.

There is also the issue of culture and mass habits towards the systematic use of digital technology in reading. This aspect will be more likely to be addressed when there is a full integration of actors, agents, institutions and other parties involved in the publishing industry innovation system. Currently we see specific actions, although sporadically integrated or coordinated, by some agents in the system. However, these actions are often going in opposite directions. It is clear that there is a movement towards the "digitalization" of publishers, and that some are apocalyptic beliefs related to non-adherence to digital technologies. But there is no unanimity and the number of divergent agents prevents a systemic broad-spectrum approach in the sector. Against this backdrop, the debate about the future of printed communication will still require some time to mobilize the industry ostensibly towards digital technologies, and e-books as well as audiobooks will continue to be available only to a small portion of society.

## CONCLUSION

The publishing industry can be considered an actor in the value chain of the paper, printing and packaging industries. There is a clear integration and interdependence between the actors in the chain, given that one depends on the other for their livelihood. The chain as a whole is at a turning point, due to the consolidation of digital technologies that can potentially establish new directions for its actors. Printed publications, although dominant in the universe of influence of the industry, could technically be replaced by digital publications such as e-books and audiobooks or the like, depending on the type of application or use. However, there is an institutional environment that represents a barrier to this replacement, including factors such as the culture of the population with respect to printed communication, taxes on paper and the power of access to digital media among others.

The context of the sector brings a quadrant oriented towards sustainability, in which an aspect of job safety is inherent that could potentially cause extensive or even unfeasible adjustments in some players. However, it is still early to deal with these movements. The issue of job safety is basically that arising from the regulations issued by the Labour Ministry in the form of Regulatory Standards, some of which apply to the sector. As these regulations have force of law, it is an imperative that they be fulfilled. The issue of sustainability, in turn, is much broader. Since the widespread diffusion of digital communication through new media can mean a drastic innovation that would break the prevailing printed communication paradigm, a new perspective of sustainability would emerge, because there is a significant difference in the social-environmental impact of a likely digital communication paradigm and the prevailing printed communication paradigm, despite a possible adoption of FSC certification on a universal scale.

Although the e-book represents a potential innovation in the publishing scene, that was not what Golden and Oddone (2013) found. The authors' research indicated that "a significant change in the Brazilian university publishing scene is not taking place yet." They added that national publishers "are in the early stage of using digital books as a publishing innovation strategy". This position shows compliance with the dominant paradigm, whether through culture or the actors' resistance. As a final conclusion, one could say that the industry is on the brink of a possible shift in paradigm through radical innovation, but that the dominant paradigm – that of printed communication or publication - will still be around for some time to come.

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