DOSSIER

ATTRACTION JOURNALISM WITH IMMERSION AND PRESENCE-BASED SYSTEMS:

experimental approach applying the classical diffusion of innovation theory

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ABSTRACT – The potential adoption of content characterized as immersive journalism is analyzed, using the Diffusion of Innovations area and a prototype news consumption environment based on virtual reality. The methodology involved a bibliographic review, an empirical experiment, and consolidation of the theoretical proposition of journalism of attractions. As a result, we suggest that most of the factors correlated to the acceleration of the adoption process, nowadays, present difficulties, such as access to experimentation itself, cost of equipment, ergonomics, and the still initial phase of building a narrative language of its own, at a stage similar to the period of cinema in which the production of the Lumière brothers, Méliès, and other forerunners, had not yet discovered the resources to tell stories in a current way and was only able to impact the spectators, through the previous references of the circus arts and the theater, in a direction focusing on sensory stimuli, current essence of content using VR.

Key words: Diffusion. Innovation. Virtual reality. Metaverse. Cinema of attractions.

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JORNALISMO DE ATRAÇÕES E CONTEÚDOS BASEADOS EM IMERSÃO E PRESENÇA: potencial de adoção a partir de uma abordagem experimental, sob a ótica da teoria clássica da difusão de inovações

RESUMO – Analisa-se o potencial de adoção do conteúdo caracterizado como jornalismo imersivo, usando a área da Difusão de Inovações e um protótipo de ambiente de consumo de notícias baseado em realidade virtual. A metodologia envolveu revisão bibliográfica, experimento empírico e consolidação da proposição teórica de um jornalismo de atrações. Como resultados sugerimos que a maioria dos fatores correlacionados à aceleração do processo de adoção, no momento atual, apresenta dificuldades, como o próprio acesso à experimentação, custo dos equipamentos, ergonomia e a fase ainda inicial da construção de uma linguagem narrativa própria, em um estágio similar ao cinema, no período em que a produção dos irmãos Lumiére, Melies e outros precursores, ainda não tinha descoberto os recursos para contar histórias do jeito atual, e sim, conseguia apenas impactar os espectadores, através das referências anteriores das artes circenses e do teatro, em um direcionamento com foco em estímulos sensoriais, essência atual do conteúdo usando RV.
Palavras-chave: Difusão. Inovações. Realidade virtual. Metaverso. Cinema de atrações.

PERIODISMO DE ATRACCIÓN Y SISTEMAS BASADOS EN INMERSIÓN Y PRESENCIA: potencial de adopción desde un enfoque experimental desde la perspectiva de la teoría clásica de difusión de innovaciones

RESUMEN – Se analiza el potencial de adopción de contenidos caracterizados como periodismo inmersivo, utilizando el área de Difusión de Innovaciones y un prototipo de consumo de noticias basado en realidad virtual. La metodología implicó una revisión bibliográfica, un experimento empírico y la consolidación de la propuesta teórica de un periodismo de atracciones. Como resultado, sugerimos que la mayoría de los factores correlacionados con la aceleración del proceso de adopción, en la actualidad, presentan dificultades, como el acceso a la experimentación misma, el costo de los equipos, la ergonomía y la fase aún inicial de construcción de un lenguaje narrativo por su cuenta, en una etapa similar al del cine, a la época en que la producción de los hermanos Lumiére, Melies y otros precursores, aún no había descubierto los recursos para contar historias de la manera actual y sí, solo lograba impactar a los espectadores, a través de las referencias anteriores de las artes circenses y el teatro, en una dirección centrada en los estímulos sensoriales, esencia actual de los contenidos utilizando VR.
Palabras clave: Difusión. Innovaciones. Realidad virtual. Metaverso. Cine de atracciones.

1 Introduction

Academic and scientific activity that focuses on journalism and its transformations brought on by the digital environment has mapped out a complex system of hybridizations, tensions, and reconfigurations over the last two decades; however, this is still an ongoing process and as such is difficult to get a handle on.

Within a descriptive-interpretive line, the arrival and adoption of technologies, hardware, and software have, over time, led to

changes in processes and procedures, caused industry business models to be revised, and changed the relationship with audiences and their own role as increasingly frequent partners. This happens not only in agendas and productions but also in product positioning and validation based on engagement metrics and indications of interest.

The infusion of information media characteristics, adding well-known aspects such as hypertextuality, multimediality, interactivity, personalization, memory, and changes to narratives in news production was a natural pathway that opened up space to structure databases, content management systems, and production process control. This has allowed for new trends, increased levels of personalization, and search results translated into numbers of views, permanence, and rejection (bounce) time, among others.

Data visualization (Rodrigues, 2009; Cordeiro, 2013), improved optimization techniques in search engines and automated information collection (Bradshaw, 2014; Bruns, 2017), and the development of specialized systems capable of dealing with large volumes of data (Gonález-Bailón, 2013; Lewis & Westlund, 2015; Lima Jr., 2012) have also affected professionals in terms of employability and a growing interdisciplinary nature which are nowadays linked to Computer Science, Design, and Data Science.

Automated texts and, more recently, the incorporation of emerging technologies such as artificial intelligence, augmented reality, virtual reality, the internet of things, and big data increase the possibilities of conducting studies on constructs and theoretical frameworks which, up until now, have not been fully explored by communication scientists.

Journalism, through its continual connection with the real world and its movements, became an arena for experimentation, validation, and questioning between innovations, theoretical possibilities, and real practices available in the contemporary scenario.

Recent academic interest in topics such as immersive journalism (IJ), 360-degree content, augmented reality (Santos, 2015, 2018, 2019) and, more recently, metaverse (Santos & Cordeiro, 2022), avatars, and their use in news production are proof of this trend. Unfortunately, some of them are developed in a rushed and less in-depth way (Dos Santos, 2017), and thus disregard the previous and broad theoretical references of these areas and their origin.

Journalism has evolved over the last decade, particularly concerning experiments in news production, and now consumers of

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informative content have become active participants in the news, and thus in a story.

Immersive journalism refers to the use of technologies such as virtual reality (VR) and augmented reality (AR) to produce synthetic environments that allow people to experience events or situations as if they were there themselves. According to De la Peña et al. (2010), immersive journalism is an interactive medium that allows users to become participants in a story. The idea behind this is to allow the public to interface with the narrative in a more immersive way than traditional journalism.

In this paper, we analyze the potential adoption and gains of some of these immersive practices. This is not based on guesswork, futurology, or essayism, but through a set of theoretical references that include previous production in the areas of knowledge where such technologies originated. Experiments and applied research projects have allowed us, over the years, to combine empirical learning with theoretical propositions, inspired by Sennett (2009) who describes the combination of knowledge acquired by the hand and the brain of the craftsman.

One example of this was the usability tests carried out in the Jumper project by LABCOM/DCS/UFMA. After building a prototype for news consumption using virtual reality devices (Santos, 2018), tests were then conducted with 50 individuals who assessed the experience of consuming informative content within immersive journalism.

Different from previous studies which focused solely on the construction of the material, the Jumper project assessed aspects such as ergonomics, interface, immersion, presence, and understanding of the information presented, and offered suggestions for improvements.

The experiment involved asking university students to volunteer and filtering out those who might experience discomfort using virtual reality glasses, such as people with high myopia. The prototype is then used to reduce any initial strangeness and familiarize the individual with how the system works and expose him or her to the content created. The individual initially sits down to use the prototype and then after some time is asked to stand up while using it. Lastly, the individual fills out data collection via an online form, the raw results of which are available for peer analysis.

Figure 1

Images of the JUMPER project, an immersive environment experiment for news consumption by LABCOM/DCS/UFMA

Source: Santos e Cordeiro (2022).

A number of studies have been conducted on the effects of immersive journalism on audiences. One of the main findings from these studies is that IJ content can lead to increased empathy (Sánchez Laws, 2020). A study by Sundar et al. (2017) found that immersive journalism, in the form of VR and 360-degree videos, can increase the perception of realism which results in a more emotional response from audiences. In addition, Van Damme et al. (2019) found that 360-degree video journalism can create a greater sense of presence, leading to an increased emotional engagement with the story.

However, the impact immersive journalism can have on audiences is not always positive. Shin and Biocca (2017) argue that VR immersion can be too intense for some viewers, inducing feelings of disorientation or nausea. Mabrook and Singer (2019) suggest that immersive journalism can be used with the intent to manipulate or even mislead. They claim that if IJ is not objective, it could be used to manipulate the emotions or opinions of the public.

The use of immersive technologies in journalism raises some ethical questions. Kool (2016) suggests that this type of production could eventually be used to create false or misleading impressions,

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as the viewer is unable to distinguish, to some degree, between the virtual world and reality. Immersive journalism also raises issues of consent and privacy, particularly when dealing with sensitive topics such as trauma or conflict.

Jones (2017) argues that the main ethical issue in immersive journalism is its potential to manipulate emotions. He suggests that IJ needs to have transparent goals and methods, and should not exploit the audience's emotions when narrating events.

Immersive journalism is an emerging trend that increases the impact of journalistic reporting by creating a sensory and interactive experience. This approach has been explored by several authors and researchers who analyzed how virtual reality, games, and other technologies can influence the way journalism is produced and consumed.

One of the main challenges of immersive journalism is the need to develop technological skills and new professional profiles that will be able to deal with the demands of this approach. As López-García and Rodríguez-Vázquez (2017) point out, immersive journalism requires one to be skilled in areas such as programming, graphic design, audiovisual, and more.

Another important aspect of immersive journalism is its relationship with the public. According to Domínguez Martín (2013), interactivity and immersion can enhance the public's emotional connection to news stories. In this sense, immersive journalism is a strategy employed to attract readers' attention and increase their loyalty.

Domínguez (2014) also proposes a journalistic form based on interface and action, which can be applied to immersive journalism. This approach values interactivity and public participation in the production of journalistic content.

Other authors have focused their efforts on exploring the possibilities of immersive journalism in different areas. For example, Bautista et al. (2018) discuss the use of 360º video and virtual reality in marketing and advertising strategies. Ambrosio and Fidalgo (2019) propose a series of immersive journalistic genres that can be produced using virtual reality and 360º video.

The Immersive Journalism Lab in Spain is the country's first immersive journalism laboratory created with the aim of exploring the possibilities of this approach and developing new forms of journalistic production (López Hidalgo, 2016).

In this paper, we use the classic Diffusion of Innovations (DOI) theory to support our proposal to analyze the potential for sustainable

and scalable adoption. This provides us with a consolidated tool to think about factors or conditions that could help increase the adoption of innovations on a general scale.

We defend the hypothesis that the consolidation of immersive narratives in the journalism industry is still in its initial phase and as such is still uncertain. Other areas with a sustainable critical mass of users, with a few exceptions such as games have not yet been established, despite the enormous efforts and investments of major technology players.

We understand that these are simple explanations for the current situation considering that when inserted into a complex ecosystem of media and the digital environment more extensively, journalistic content production is impacted by a number of forces, not just technologically speaking, but also economically and socioculturally. Physiological (Francesco & Nakagawa, 2017) and even personal (Shin & Biocca, 2017) factors should also be considered.

Relatively old studies (about 10 years ago) indicated that consumption of traditional media such as printed newspapers and magazines had been on the decline (Statista, 2016; Iab Brasil, 2014), while digital media consumption had been on the rise. It is also well known that current generations present decreasing rates of information consumption through traditional channels (Dixon, 2014).

The old business models still facilitate current media products (journalism among them), but a generational issue will appear in the near future: children and young people who are now between 8 and 17 years old will soon enter the working world and become formal consumers (not that they aren't already), using their own income for consumption. What will the media companies of the future (and the present) have to offer these generations?

The need for information consumption in the contemporary world continues, which means that opportunities in this market will remain available. The question is how to serve them in the future.

Thus, exposed to vectors that alternate in strength and direction, the information content industry tends to explore many possibilities but only adopts the possibilities that manage to be configured in a demonstrably positive way from metrics, such as return on investment, engagement numbers, and clear avenues toward monetization or strategic advantages. Internal experimental development (a path also described in this paper) is one way to obtain results in this area, as Salaverria (2015) demonstrates.

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The decline in the perceived value of the news and the fragmentation of audiences, spreading across social media platforms and alternative information channels, has accelerated the trial-and-error process of a segment of the economy that has been rather uneventful for decades. This industry (based on solid business models that have always proven to be efficient) was turned upside down with the arrival of the internet and the digital environment, and presented a wide array of new challenges to large newsrooms, the biggest one simply being to continue to exist.

In this way, analyzing the chances of adopting a scale of potential consumption of immersive journalism content can collaborate with the decision-making and innovation processes in which most contemporary newsrooms, in one way or another, are involved.

2 Diffusion of Innovation (DOI) and potential adoption factors

Before their current adoption cycle, devices like tablets (still produced by big tech brands like Apple and Samsung) were unsuccessful in their initial launch process. When they first arrived on the market, tablets were basically storage devices that were a kind of intermediate between cell phones and desktop computers. In short, they acted like large USB drives or content players and, due to their limited features, aroused little interest among consumers. The lack of sales, although little known or documented, was inevitable.

In addition to the evolution of the hardware used in these products, the incorporation of more efficient operating systems, and a new business model based on application stores, enhancing the device to have a myriad of functions transformed its usage possibilities and led to the desired scale adoption of this product. Not only was the device itself improved, but there was also a significant increase in the perceived value of its use due to the innovation of apps, stores, developers, and new businesses.

This symbolic case of the industry teaches us that incorporating other vectors, both social and economic, has a significant impact on its potential for scale adoption and, consequently, success in a given market. Scientific efforts to understand general processes of adoption and circulation of innovations pre-date tablets.

One of the best-known efforts is the subsection of sociology called Diffusion of Innovations (DOI) which, based on studies

by predecessors such as Gabriel Tarde and his "laws of imitation" and Georg Simmel, initiated discussions on how certain ideas or behaviors are replicated among people. DOI was not consolidated by investigating technological equipment in global markets but by the emerging American agribusiness industry in the state of Iowa, a strongly conservative environment and averse to change.

> Interest in propagating ideas, behaviors, opinions, products, and technologies through networks of social relationships goes back to an empirical research area of sociology known as the diffusion of innovations. Works such as Ryan and Gross (1943) had already studied this theme in the first half of the 20th century. The questions they sought to answer are still pertinent today: what factors favor or hinder the dissemination of new concepts or ideas? On what parameters do people base themselves to adopt a new pattern of behavior or to, at least, consider it as a possibility? Is it possible to find rules or laws that explain this process? (Santos, 2016, p. 24).

Studies on DOI were consolidated over time in works from Rogers (2003) and Valente (1995, p. 2) who stated the "diffusion of innovations is the propagation of new ideas, opinions or products through a society". According to Rogers, "diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system. It is a special type of communication in which messages are conceived as new ideas" (p. 2). Rogers states that the diffusion of innovations is related to the level of uncertainty that actors have about it and their search for information to lessen this uncertainty.

> The innovation-decision process is essentially an information seeking and information processing activity in which an individual is motivated to lessen uncertainty about the advantages or disadvantages of the innovation. (Rogers, 2003, p. 4).

DOI teaches us that sustainable adoption occurs based on a number of different scenarios or factors which advance the essential process of knowing that the innovation exists, then seeking information about it, experiencing it, and ultimately perceiving value and advantages capable of overcoming one of the main difficulties in the adoption process, referred to in marketing as the cost of change.

Once this path has been successfully followed, the decision is then made to abandon an old way of doing something and replace it with a new more advantageous way. The other side of this coin leads to progressive forgetfulness and reduced levels of use. Data from López Hidalgo et al. (2022), although quite limited, may represent something

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in this direction for the growth of immersive journalism. A third possible scenario would be coexistence with these initiatives, albeit limited, for an undetermined period of time while waiting for a larger set of factors to emerge that could boost the growth of the trend.

These windows of opportunity, like the alignment of the planets, are neither frequent nor easy to reach. The list of genius ideas in human history that ended up not working out is a long one. This does not mean that mistakes, experimentation, and learning from unsuccessful attempts are not useful. They could lead to a larger-scale adoption in the future, even if the product was not successful in the present. Startups and innovation hubs realized this a long time ago and incorporated these processes into their operations and toward developing projects.

For the purposes of this paper, we chose the metric of adoption speed or rate of adoption and the impact factors associated with it. Adoption speed is the measure of time required for a certain percentage of members of a social system to adopt an innovation. Some of the factors that impact this metric have already been documented (Valente, 1995; Rogers, 2003). Their correlation levels may vary slightly between scenarios but, in general, they are considered useful indicators for this type of assessment (relative advantage, compatibility, complexity, testability, and observability). Based on these factors, we shall analyze the potential for adopting emerging technologies such as virtual reality in the journalism production process.

3 Relative advantage

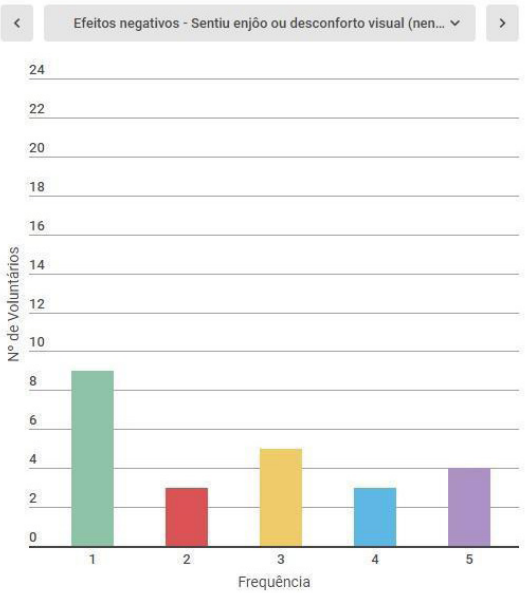
Relative advantage is defined as the degree to which an innovation is superior to an existing one. In this regard, comparing experiences of consuming journalistic content in the traditional way or through virtual reality devices is quite difficult, mainly due to a difference in scale and access possibilities.

While a connection to information through print, radio, TV, and the internet (Cetic, 2021) is something quite common, enjoying an immersive narrative, at least in its complete and richest form, depends on devices that are quite expensive for the average Brazilian and not very accessible for today's news consumers. This is one factor that limits the perception of advantage, which is also impacted by other parameters.

One of these parameters, despite being quite basic, is often ignored by those who currently analyze this issue in the field of communication. The parameter is that virtual reality devices, even the most modern ones, cause some level of physical discomfort to a reasonable percentage of users.

Figure 2

Test scale indicating some level of discomfort when using virtual reality devices, where 1 corresponds to no discomfort and 5 corresponds to severe discomfort



Source: Santos (2018).

4 Compatibility

Compatibility is the degree to which an innovation meets the values, past experiences, and pre-existing needs of potential adopters. In this aspect, there is partial compatibility because one could use a smartphone screen to access content in virtual and immersive reality, particularly images generated by 360-degree cameras (although these images would have lower resolution and slower loading times

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due to the hardware's limited capability to process relatively large files with three-dimensional rendering.

However, as mentioned earlier, the richer experience of using immersive content requires additional investments in hardware, which decreases the perception of compatibility and naturally adds to the cost.

5 Complexity

Complexity is the degree to which an innovation is difficult to understand and use. This is perhaps one of the most critical aspects of immersive journalism. The lack of digital literacy, the understanding of a new logic for using that content (which includes the issuers), and the still early stage of the narrative language being coupled to these devices can compromise the adoption of these systems.

Our hypothesis is that there is still not a complete understanding of immersive content and possible narrative resources to guide information consumers. In other words, we have a language whose structure is still in development and, therefore, incapable of efficiently leading someone through a specific diegetic world or synthetic metaverse.

We consider this initial phase of building narrative language similar to the early cinema (Costa, 1995) where the Lumière brothers, Méliès, and other forerunners had not yet discovered the necessary resources to tell stories in a current way and could only impact viewers through circus arts and theater references, what some authors referred to as the cinema of attractions (Gunning, 1986).

Early cinema used theater and static photography as references and it was only over time that narrative resources were able to be improved upon. We see a similar thing occurring with current immersive content. Now it is the traditional audiovisual language, inherited from cinema and TV, which is the foundation, but it will have to be reconfigured and evolve in order to give the immersive narrator a broader set of resources capable of involving an interactor with much more agency, that is, decision-making power to exercise their will within the narrative context (Murray, 2003). In addition, it is also necessary to overcome, or at least better understand, inconsistencies and normative paradoxes, as pointed out by Aitamurto (2018).

More recent studies, like those by Herrera Damas and Benítez De Gracia (2022) who conducted interviews with fifteen world industry leaders, support our hypothesis that this type of journalism

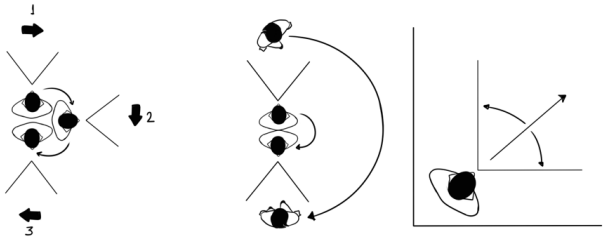
is in its experimental stage and, therefore, still consolidating the narrative language used in it. The need to develop a specific model of communication for this type of journalism is defended by Paino and Rodriguez (2021). A study by De Bruin et al. (2022) analyzed 189 immersive journalistic productions and concluded that the user's level of immersion in these productions is quite limited, with few interactions or inclusion possibilities. Uskali and Ikonen (2021) also state the need for ethical issues in IJ productions to be further discussed.

An example of this is that, for 360-degree content, the frame and the orientation built by the director/editor in a traditional television news story (Fig. 2) are not able to guide a viewer who has, in Murray's (2003) terms, an agency or the ability to interact and make decisions on a broader level.

In our exploratory work, we have tried to understand these new possibilities for developing a grammar for building immersive narratives in the emerging area we call attention design.

Figure 3

Studies on attention design in 360º visualization environments where the basic concept of the frame does not work as it does in traditional audiovisual narratives



Source: Santos (2018).

6 Trialability

Trialability is the degree to which an innovation can be experimented with on a limited basis. Closely linked to other characteristics mentioned in this paper, the possibility of testing an innovation has a significant connection in many cases evaluated by ID literature.

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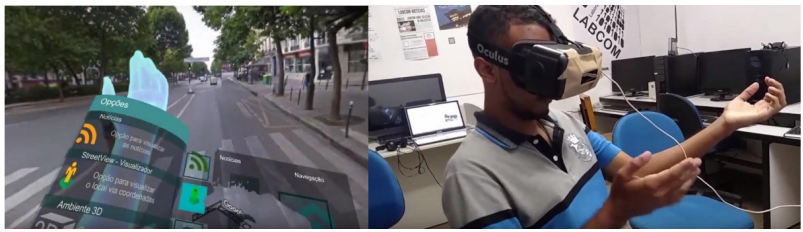
Adopting an innovation is a process of searching for information and reducing uncertainty about said information, and testability can make a difference in this process, giving the adopter a chance to put him or herself in the situation without having to incur financial and other burdens.

The economic aspects listed in the first item of this list naturally explain that the possibilities of testing and experimenting with immersive content are smaller. Even when this happens, simple factors that go unnoticed in many essays on the subject in our area have taught us that in environments with slightly higher temperatures, as in many Brazilian cities, eyeglasses quickly fog up, compromising the immersion process that is so essential toward having a more enjoyable narrative experience.

Another aspect we observed through the experimental approach was that interaction interfaces in three-dimensional environments still need to improve in terms of ergonomics and usability. The interface initially developed in the Jumper project, although visually beautiful, weighed heavily on the shoulder after a few minutes of use.

Figure 4

Initial control interface in the Jumper environment and position of the user



Source: Santos (2019).

7 Observability

Observability is the extent to which the results of an innovation are visible to others. Linked to the previously listed factors, the ability to observe benefits (which is added motivation for adoption) is usually included in diffusion processes which prove difficult to

test and use complex innovations. Seeing positive results in terms of adoption prompts discussions among peers and information to be shared among the contact networks of potential adopters.

At any rate, this specific aspect has been limited by large investments from big technology players in terms of developing their products and spreading positive content about them.

8 Final considerations

The theoretical and experimental path leads us to believe that the consolidation of immersive narratives in the journalism industry is still in its early stages. Broader adoption potential of consumption still currently presents challenges such as limited access to experimentation, the cost of equipment, problems related to ergonomics and usability, and the initial phase of building a narrative language.

These challenges may come from more recent movements to reduce experimentation in some newsrooms. Data from López Hidalgo et al. (2022), although very limited, point to this trend still needing to be better mapped in broader scenarios. Work from Shin and Biocca (2017) reflect on the importance of previous user experience when evaluating immersive content which, in theory, contradicts the simplistic idea that only the product being tested defines a positive or negative receiver perception.

Regardless, the constant need to seek innovations and ways to maintain sustainable conditions for business continues. Studies such as Salaverria's (2015) demonstrate that the experimental approach and innovative development, organized through internal laboratories and startups, has been one of these paths.

In this respect, there is still not much-applied research being done in the Brazilian academic environment on immersive journalism, which results in more studies of an essayistic or just descriptive nature. These studies point to a future that depends on the author's imagination or to a past that is becoming increasingly anachronistic given the speed of transformation and technological development in the digital environment, as well as the economic and sociocultural developments associated with them.

The growing interest in the metaverse, far beyond the current academic attention, might represent a transition towards

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a broader and more sustainable adoption of immersive narratives, not only due to technological aspects but also to the economic and social vectors associated with it that, as in the case of tablets, now linked to other events with the potential to accelerate the process. In theory, the decentralized web, cryptocurrencies, blockchains, NFTs, and other current possibilities connected to the metaverse concept are additional forms for enabling a broader and more consistent adoption.

Using any of the adoption rate growth variables listed above could have positive impacts on journalistic organizations that are testing (or considering testing) immersive content as an alternative to information overload and the decrease in the perceived value of its main product; the news.

The path of applied research and real contact with users, devices, and user experiences seems more useful as a scientific work than attempts to guess the future based on personal digressions and lack of knowledge about constructs such as immersion and presence in their areas of origin.

The interdisciplinary challenge constitutes a greater effort to update the state of the art related to the theme and model it for a specific purpose, such as the use of immersive content within the journalism production process. What we can do today is analyze different scenarios that could translate immersive journalism into a factor for increased understanding between the journalism industry and its audiences, both present and future.

NOTES

1 The term metaverse generally refers to the connections between the real world and the synthetic one created by computers which use digital representations of individuals (avatars) to overcome physical and temporal barriers.

2 For an introduction to narratives based on immersion and presence from an interdisciplinary perspective, see Santos (2019).

3 For example, studies by Sheridan (1992, 1996), Slater and Wilbur (1997), Stanney and Salvendy (1998), and Witmer and Singer (1998).

4 A video including a detailed description of the project (started

in 2016, funded by FAPEMA) is available at: www.youtube.com/watch?v=nmmT5Wt043g

5 Data available at: https://docs.google.com/spreadsheets/d/1HlpvSNN6os0A7hCr1zgm7Z58GEeod4r0JbHEPHtdGzw/edit#gid=319788223

6 The diffusionist movement is also considered in pioneering studies on DOI. Diffusionism is the point of view that argues that social changes are the result of the introduction of innovations that spread from one source in a given social system.

7 The concept of a diegetic world, one that is built from the narrative, can be seen in more detail in Aumont (2007).

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