Digital Media

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In the various texts that this Dossier brings together, the central point is the results that digital media technologies have provided for different cultures. In this context, the authors analyze the creation of the image, the impact of algorithms on the news and the audience, the audiovisual associated with VR (Virtual Reality) and the viewer, the industrial production and the multicultural globalization.

We believe that the questions that permeate the texts and the paths that the authors followed in their studies are sources for new discussions and suggest a wide range of developments for future research. Furthermore, these are essays that make us think about who we are and how we live in a world that is increasingly closer to digital media.

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Table of Contents

Preface

Claudia Lambach

This Book, ***Digital Media***, was born from a fortunate meeting between **IAMCR** – International Association for Media and Communication Research – through the *French Cinema + VIC Cine Club + Digital Media Project*, and **CIAC Editions**, thanks to a Fund I received from IAMCR. In the first half of 2023, I obtained the acceptance of IAMCR to carry out a project under the coordination of Denize Araujo, PhD, Chair of **VIC-Visual Culture WG** and Thomas Wiedemann, Vice-Chair of VIC. The scope of the project was to develop specific activities related to VIC activities for the event that took place in July 2023, in Lyon, France, the ***IAMCR Conference 2023***.

The first moment of this project was directed to the **Pre-Conference** and aimed to prepare IAMCR members for the Conference in Lyon, offering the possibility for them to get to know French Cinema from its birth to contemporary cinema. Thus, activities were carried out in two workshops and two online publications, the **E-Book French Cinema**, published by Appris Ed. (https://shre.ink/frenchcinema) and the **Dossier French Cinematography**, by Famecos Journal (https://revistaseletronicas.pucrs.br/ojs/index.php/revistafamecos/index). VIC CineClub, curated by Thomas Wiedemann, also presented a series of French Films that were discussed among members that analyzed them. Here are the links of both publications:

The second part of the project concerns the **Post-Conference**. For this phase, the activity was defined as the publication of texts presented at the Conference and carefully chosen for the **Book Digital Media**, which focused on the theme of the Conference in Lyon, "Inhabiting the planet: challenges for media, communication and beyond". To this end, we invited members of 3Ss and 2WGs who deal and develop dialogs with the themes expressed in the title of the book, digital media: History Section mentions "the role of communication technologies"; Journalism Research and Education Section refers to "emerging technologies"; and Section Communication Policy and Technology cites "aspects of technological change". Digital Divide WG includes "new digital environment" and Media Production Analysis WG works with "a variety of media technologies".

The essays presented here, bridging together works by researchers from Romania, Portugal, the United States, Brazil, Italy, Spain, India and Canada, were grouped within a logic that contemplates the impact of digital media technology on people's lives in different social realities, as well as the creation of digital images in contemporaneity and the active participation of spectators, considering immersive technological processes such as **VR** – Virtual Reality and **AR** – Augmented Reality, among others.

The Book opens with the text *Algorithms for Online News Production and Audience* by **Georgeta Drulă (Romania)** in which the author highlights the importance and impact of algorithms in the production, dissemination, creation of news and audience participation in Romania.

Next, we have the text *Art, media and digital platforms: the Virtual Museum of Lusophony on the Google Arts & Culture* by **Alessandra Nardini (Portugal), Elaine Trindade**

(Portugal) and **Moisés de Lemos Martins (Portugal)**. The authors analyze the Virtual Museum of Lusophony, on Google Arts & Culture, and the exhibition "Malangatana: the legacy of the Mozambican artist", based on theoretical reflections on art and technology, highlighting important cultural points and their resistance, Lusophony and multicultural globalization.

Lawrence E. Wood (United States), with his text *Competitive Photography and Digital Inequality: An Analysis of Instagram's ipostghana*, analyzes digital cultural production and dissemination in digitally marginalized regions of the world and the relevance of discussing digital inequalities.

The next essay, *Inside the advertising: brand communication in virtual reality*, by **Eduardo Zilles Borba (Brazil)**, presents audiovisual engagement and VR as a medium, analyzing ten advertising pieces from different brands and the importance of creating and/or analyzing advertising in immersive media.

Michele Varini (Italy), with his text entitled *Fashion through the looking glass – The new circle of production of imaginaries within the Digital world*, addresses the fashion industry from the point of view of digital consumption and production and the unfolding of these new paradigms.

In the text by **Glenda** and **Jesse Drew (United States)**, *Augmented Reality and New Ways of Seeing*, the authors bring examples of their artistic works using AR – Augmented Reality as an important creation technique for visual artists. With their artwork, the authors raise important questions about the future of the planet in the face of global warming.

In *Navigating the Landscape of News Consumption and Avoidance in the Digital Age: The Spanish Case*, **Laura Pérez-Altable (Spain)** and **Javier Díaz-Noci (Spain)**

present a methodological analysis of news consumption in Spain from the point of view of digital transformation. For this study, 1,400 participants were interviewed.

Shivani Sharma (India) and **Jon Bath (Canada)**, in *Platforming the Epic: An Intermedial Approach to Virtual Reality and the Immersive Simulation of the Mahābhārata*, present the possibility of visualizing *Mahābhārata* tales in virtual reality, analyzing from the democratization of the narrative space, the different modalities of virtual reality and the semiotic process and the possibilities of (re)imagining the epic through intermediality.

Finally, we have the research by **Flávio Carvalho (Brazil)** and **Denize Araujo (Brazil)**, *Expanded Digital World: VR, AR, AI, Spectatorship Immersion*, which addresses creation, production and spectatorship in the face of expanded digital technology and recent spectator´s concepts that emerged from the advent of innovation technologies that made possible new creations in the world of cinema and audiovisual.

I hope that these texts lead the reader to deep reflections on the research of Digital Media, unveiling a series of possibilities for the use of image technology and the importance of discussions on the subject. I would like to thank **Susana Costa & Juan Manuel Escribano** for the publication at the CIAC Editions and **Elske van de Fliert**, on behalf of IAMCR Fund that made possible all these activities. I would also like to thank the authors who sent their texts to this Dossier. I noted that at the end of this work it is possible to view the mini biographies of all of them.

Algorithms for Online News Production and Audience

Georgeta Drulă

Abstract. Information-seeking drives the audience's journey through news, however, algorithms also have an influence. This research aims to evaluate the effect of algorithms on audience engagement with news websites.

The research examines several news sites attempting to improve their online presence and audience feedback through automated processes and algorithms.

This study highlights the growing significance of algorithms in news production and dissemination, and examine closely their impact on news creation and audience traffic acquisition in Romania.

Keywords: search engine algorithm · algorithms in journalism · audience traffic · newsfeed algorithm · automated journalism

Introduction

It is widely recognised that search engine algorithms play an increasingly important role in journalistic workflow for creating articles using keywords, analysing big data, generating diverse infographics, or illustrating the evolution of a phenomenon.

The implementation of algorithms also impacts the way in which the audience receives information, particularly through the use of keywords. Online selection processes are determined by algorithms that identify the audience's favoured information.

Algorithmic media follow the audience's interests in different topics but also different patterns of search. Frequently, a connection is established between search engines or social media algorithms, and media consumption. These algorithms gain their strength through impartiality and offer the audience more choices and perspectives on information. Algorithms filter the search in the immense space of information and give the most relevant for the audience. This content is also the most susceptible to being liked, shared, or commented on by users, thus have the potential to stimulate user interaction.

According to a 2018 Reuters Institute study, algorithmic content selection is equally prevalent as editorially chosen content in news feeds. These approaches are indicative of the information quality aspects attributed to artificial intelligence (AI) and algorithms.

Moreover, from the perspective of news sites, most facilities for automating journalistic activities based on different algorithms are achieved through the functionality of content management systems or other software for audience data management. Real-time online audience traffic monitor-

ing software is an option for news automation. Meantime, improving automated news reporting, and image or video management could prevent and detect fake reports as well.

Several initiatives related to artificial intelligence and algorithms are in practice, but most newsrooms still do not consider these solutions or innovations in journalism. Automating routine tasks is vital to producing great content with few resources.

The methodological solution in this study is the correlation between factors implied in Google or social media algorithms and audience traffic performance. At the same time, these factors influence how the content arrives at the audience. The factors considered in this study are components of Google's ranking and social media ranking algorithms. Also, factors for audience engagement are average visit duration, pages per visit, bounce rate, traffic from search, and traffic from referrals.

The conclusions of this analysis show different strong relations between factors of algorithms and audience traffic in the Romanian news sites.

1. Literature Review

Production and consumption of multimedia content in news sites are managed by many automated processes on various platforms. Thus, processes such as audience analysis and monitoring, filling up the news feeds, and big data collection for documenting a topic, all are under the logic of algorithms.

Under the choice of algorithms are also the content produced or distributed by the audience, and their possi-

bilities to be informed. The audience must be receptive to changes that now also involve artificial intelligence in the creation of some content. Interactions with this content also present a challenge for audiences who have to contend with bot comments, fake news, recommendations, or other types of news generated by algorithms.

In this environment very changeable, both newsrooms and the audience face the various factors of the algorithms in the media platforms. Thus, a lot of tools accompany the media audience research, measuring their behaviour and actions under the logic of the algorithm.

The journey through the news is always guided by our interests in some information, but the algorithms as well. Bell (2022) lists which are the most important machine learning (ML) algorithms applied in the search engine optimization (SEO) process and according to what big data are processed and offer decisions for a place in the news market. Why are so important these algorithms? Because most of them provide information and process operations such as keyword ranking for content, content development, ad design, or activities of campaign direction. The ML algorithms involved in these activities are used for data classification in audience segmentation in online campaigns. They are algorithms able to predict user behaviour.

Google's algorithms are a must-see when it comes to algorithms and media. They help organize information to be found by the public. Search engine algorithms influence the journalistic work and audience traffic for the news likewise.

Meanwhile, the public finds a huge volume of information and news, and the algorithms dedicated to managing

big data can visualize them as infographics. So, let's consider the categories of algorithms mentioned above.

According to sources analysing Google's ranking factors in SEO copywriting, a survey conducted by SEOMoz and cited by Sean (2023) determined that the components of Google's ranking algorithm consider factors such as 23.87% trust/authority of the host domain, 22.33% link popularity of the specific page, 20.26% anchor text of external links for the page, 15.04% on-page keyword usage, 6.91% registration and hosting data, 6.29% traffic and CTR data, and 5.30% Social Graph Metrics.

So, how can news be prioritised in Google's algorithmic rankings and therefore attract more traffic? Widmer (2022) lists the most specific ranking factors in the Google algorithms following Google's information about how search works, which are: backlinks, novelty and originality, keywords, user experience, and topical authority. Also, Sean (2023) mentions the most important factors in the Google algorithm for ranking for 2022, with factors such as backlinks (number and quality, domain name, relevant anchor texts), the content length (that attracts more social shares and engagement, associated with a relevant topic); URL, domain age and authority, mobile-first user experience and click-through rate.

All papers related to SEO practices and the Google ranking algorithm mention the most important factor in this process (66.46%), the link building with all its details (quality of anchor texts, domain age, or the number of backlinks).

The factors of Google's ranking algorithm influence almost all the newsrooms and online news production decisions. So we can introduce so-called media algorithms.

Fletcher (2020) presents the fact that the algorithmic selection of news is almost equal as a percentage to the editorial selection.

Eter (2018) speaks about media algorithms and their influence on the way audiences receive online news. She says that online news selection is not only the users' decision but also the algorithms that decide which is the most relevant content for the public. According to users' precedent options and actions, algorithms provide a personalized list of online news according to their previous preferences. Thus, in the online environment, the online news that is read by the public is the online news most relevant according to an algorithm. However, Eter (2018) says that algorithms decide as much as the audience itself. In this context, she questions the objectivity of journalism and online news for the public. In her opinion, the audience is made to consume some news and information chosen by an algorithm based on personal preferences. In media, Google or Facebook algorithms are the most important and they are marketing and SEO algorithms that put the public on a specific online news market. The fact that the algorithm anticipates the audience's options and needs in terms of information and news based on previous personal experiences on these platforms could limit the knowledge and objectivity, considers Eter (2018).

Regarding search engine algorithms and audiences for online news, Pascanet (2018) considers that the audience lives in a paradox provided by the search engine or social media platforms, because algorithms filter the relevant or irrelevant information and news for the users based on their actions and conditions. So information reaches the users following the logic of the algorithms and users consume

online news that is supposed to be liked or shared. From another perspective, huge amounts of data are offered to the public in a hierarchy of quality information and online news.

Looking at the problem of media algorithms differently, we can find that algorithms work based on and with data given by the audience, and the users during repeated searches. Marketing policies of the various platforms influence which factors of the algorithms decided more for the audience. Thus, based on our previous searches, Facebook provides posts from some friends and also numerous personalized ads, to the audience.

So the way algorithms deliver online news also influences the way it is produced. For instance, for Facebook feed or Google News feed, algorithms consider information selection for the news feed based on the data collected about the user's behaviour, or other data that the user gave to the platform. Fletcher (2020) presents the two phenomena that appear due to this selection of information based on algorithms: 'echo chambers' and 'filter bubbles'. The 'echo chamber' phenomenon refers to overexposing to news that the audience agrees with, and the 'filter bubbles' phenomenon refers to the news that is automatically eliminated. It thus is narrowing the information that reaches the users. Both phenomena are generated by the usage of algorithms in online news selection.

Mobile alerts, aggregators, or Google News application feeds also rely on algorithms that are involved in online news production.

From the audience's point of view, it is clear that services provided through the Internet are algorithm-driven. Thus,

online news gets to the users through selection filters done by algorithms. Moreover, the audience can personalize their news feed using in an aware way other algorithms. Also, the personalization news feeds work with self-selected (known algorithms by the audience) and pre-selected algorithms, unknown by the users.

Self-selected algorithms are chosen when the audience voluntarily takes some actions for specific online news to receive. These algorithms work as a consequence of users' decisions when they want to read some type of online news. Thus, the audience selects which online news to receive. This process is called by Fletcher (2020) 'selective exposure'.

Pre-selected algorithms work without users' contributions and decisions and their role is to filter some news for the audience and to take decisions and actions for the users. Fletcher (2020) mentions that audiences do not remember what sources and sites they read.

The mentioned algorithms do not apply and do not refer to the financial part of the journalistic process. We discussed these issues for free online news because algorithms could also interfere with the filtering of online news that is paid for by the audience.

Thus, all processes in the consumption of online news are guided by algorithms, as well as in the production of online news. In online news production, the search engine algorithms, and social media algorithms must be considered, because these two platforms are used by the audience to find the news.

We cannot miss the AI algorithms that are increasingly present in the content of news sites. Thus, Benkler *et al.* (2019) discuss the information quality generated by Arti-

ficial Intelligence (AI) and algorithms. We are just aware that we have many more algorithms in this context that influence online news production. Therefore, Internet platforms use algorithms to cause users to engage with multimedia content and online news, and thus lead to the emphasis of some of their opinions and beliefs.

Also, conversational bots based on AI simulate human behaviour based on generative algorithms and could provide comments or content that is not filtered or not generated by the human itself. All these actions could influence online news production, and consumption as well.

And automated news reporting relies on algorithms and could have many consequences in handling non-human video and audio content. These algorithms could influence false reporting.

Benkler *et al.* (2019) refer to big data that are in very large quantities and are exploited by marketers. In this context, the machine-learning algorithms used for publicity of some content in the news sites could generate the content received by the audience and thus could influence public opinions and behaviour.

All these algorithms are involved in online news production, but the most influential in the process are Google's search engine algorithms. Components of Google's ranking algorithm are also factors that contribute to online news production. Among these factors, we mention: the domain of the news site, links with popularity, anchor text of external links to the page, on-page keywords, and technical conditions for news site development. Analysing factors are used in this research. Among these factors, link building is a reference in the SEO process and the trends of the Google algorithm for 2023.

2. Methodological Approach

The methodology considers search engine optimization factors of news sites as elements of algorithms in news production. These algorithms' factors are correlated with audience traffic indicators to establish the relationships between online news production and audience, but also to know the role of algorithms in the online news production.

This study focuses on the news websites with higher traffic in Romania according to sati.ro (Romanian Internet Audience and Traffic Measurement) and considers factors of SEO algorithms for online news production. Also, factors influencing an audience, meaning factors of engagement and audience traffic are used in this research.

Among the factors of the Google ranking algorithm, we were able to measure and analyse: link profiles, site domain characteristics, on-page keywords, anchor text of external links, links' popularity on news online pages, and technical conditions for news site development such as page load time or speed.

This stage of research started with a niche group, sports news sites, and for this reason, we had some limitations because we operated with a small sample. The analysis of this group is not enough for a general conclusion but will continue with a larger database such as generalis news sites in Romania. We considered this niche group of news sites because they have significant audience traffic for the same categories of subjects and thus the algorithmic factors can be detailed analysed because the audience has similar behaviour on these sites. Data collected through online SEO tools during the research period are analysed using correlation methods.

The research shows how search engine optimization algorithms are involved in online news production. We assumed that there is a linear correlation between the algorithmic factors and the audience factors based on the charts. The factors that describe the algorithms are domain age, the number of backlinks, the number of pages per visit, average visit duration, loading page speed, and the average number of words per article.

As database, we selected eight sports news sites listed in the site of online audience traffic, but only five of them have a domain older than three years, to be considered in the Google ranking algorithm. Thus, we worked with these five sports news sites and this is not always a significant situation from a statistical standpoint. For this reason, we decided to extend the study to more news sites in the next phase.

3. Findings

From the perspective of Google's algorithm factors, the obtained results for the sports news sites group show that all online articles have an average of 1606 words per page with a standard deviation of SD= 486.63. The factor named the total number of links per page has an average of 113 links with a standard deviation of SD = 30.34.

Correlating Google algorithm factors and how online news is consumed by the audience, we found that the total visits to a news page are not influenced by the length of the news article, i.e. the number of words an article is written. The same result was also mentioned by Hollingsworth (2021) in the specialized literature.

It is the same situation, no correlation was found between the internal links per page and total visits. Links profile as another factor in search engine algorithms refers to the number of total links, link popularity, link quality, and anchor texts in links.

We also found no statistically significant correlation between Google algorithm factors such as different links and audience engagement, measured as the average number of pages per user visit. Therefore, users who come from other news sites following external links, do not stay longer on certain online news, so the links do not influence user engagement in this case.

Our analysis found no correlation between traffic obtained from the usage of keywords in Google searches and the number of pages per visit. Thus, even if users receive news online through search engine algorithms, it is not certain that they are interested in staying longer on the news site.

But we also found a negative linear correlation between the average visit duration and the total number of backlinks. The number of total backlinks for a news page and their quality are factors of Google's algorithm, and we identified a strong and negative correlation between visit duration and the number of backlinks ($r = -0.913$, $p = 0.031 < 0.05$), statistically significant. This relationship could be interpreted in the way that when we have many backlinks on a page, the average visit time of users decreases, and they are no longer so interested in online news. From the perspective of online news production, this correlation shows that audiences like clear news with a structured format and direct sources explained in the text.

We found a positive correlation between search engine algorithm factors such as keywords in news texts and

audience traffic, as well as for average visit duration ($r = 0.956$, $p = 0.011$). This means that using keywords in the production process of online news could influence audience traffic and engagement.

It can be noticed that the average visit duration measured in minutes is always correlated both with keywords and also with links in the process of online news production.

Top audience key performance indicators (KPIs) also relate to SEO performance and search engine algorithm factors. Thus, algorithm factors such as domain authority have values between 73 (maximum) and 52 (minimum) for the analysed news sites.

Many metrics regarding the profile of links, such as external links, spam links, and external followed links for the analysed news sites, show the importance of links as a factor in the search engine algorithm and for the online news production process.

The total number of links varies a lot from case to case, and is not dependent to audience traffic (see Table 1). The sites were named from 1 to 5 according to their position in the Google rankings and also in the Romanian Internet audience traffic ranking in the sports category.

Internal links refer to links inside the website, and external links go outside the website.

But we also have a comparison based on the number of links for the site homepage using the SEO tool checker[1].

Both links and anchor texts are factors of Google's ranking algorithm (refer to Table 2).

1. https://smallseotools.com/website-links-count-checker/

Links – factor of search engine algorithm / Sports news sites	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Total links	16,441,925	168,079,249	5,742,345	22,968,140	11,213,189
External, followed links	1,395,793	11,820,874	2,447,566	1,390,576	882,431
Internal, followed links	14,196,548	135,018,659	1,496,847	19,280,246	9,743,336
Total linking domains	4,700	9,695	6,609	7,293	1,378
Followed linking domains	3,819	8,230	5,540	6,003	1,021

Table 1. Ranking Algorithm Factors – Links for the analysed news sites

	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Total Links	420	526	353	351	297
External Links	160	76	54	64	24
Internal Links	260	450	299	287	273
No Follow	1	27	14	35	0
Do Follow	419	499	339	316	297
Internal Links Anchor Text	Live TV, video, superliga, UCL, Premier league, Tenis	Fotbal, Romania, Superliga, echipe, meciuri, clasament, liga2, Cupa Romaniei	Ai un pont, adresa email, foltbal, tenis, video, sporturi, cele mai noi	Fotbal intern, Superliga, Liga2, Fotbal Extern, Champions League	Fotbal, Fotbal Intern, Superliga, FCSB

Table 2. Ranking Algorithm Factors – Links for the site homepage

Technical conditions – factor of search engine algorithm / Sports news sites	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Pages on site	2,843	3,035	3,052	1,818	1,818
Average Page Size (KB)	108	135	206	173	85
Average Page Load Time (ms)	267	432	394	1,311	768
Average Visit Duration (minutes)	4.31	4.53	3.32	4.12	1.26

Table 3. Ranking Algorithm Factors – Technical conditions

Sports News Sites	**Traffic from Search using keywords (%) (Mean)**	**Traffic from external links (%) (Mean)**
Site 1	16.82	27.53
Site 2	16.25	5.40
Site 3	14.24	22.26
Site 4	9.27	20.24
Site 5	7.47	6.90

Table 4. Audience Traffic Indicators

Also, technical conditions intervene in Google's ranking algorithm (see Table 3). Page load time is one of them, a factor for improving user experience.

Google's Core Web Vitals indicate a good page load time of around 2.5 seconds on mobile devices. A page with a load time of up to 4 seconds needs improvements (DebugBear, 2023). A media site measures a time of around 5.5 seconds to load a page, says Anderson (2023).

Considering the links' profiles, the analysed news sites are alike, but we also have some minor peculiarities and differences. Thus, the best-ranked sites have a large number of internal links and a small number of external links.

As we can notice, there is some variation in the audience traffic situation considering the factors of Google's ranking algorithms.

Conclusions

The data analysed so far show that news sites with the highest number of visitors coming from Google search engines consider the algorithm ranking factors. A relevant links profile and a keyword strategy are suitable for quality content. We do not yet know if compliance with the criteria of the ranking algorithm also ensures the users' engagement.

We noticed that failure to meet the technical conditions takes the news site to the last position in the Google ranking.

We can also notice that a news site with high audience traffic does not have a rich link profile, especially the number of external links.

A specific problem related to Google's ranking algorithm is the factor load speed of pages. The quality of content and notoriety of some news sites produce audience traffic and a good place in the Google ranking, even if the load speed of pages is high.

The number of external links coming from other sites is a specific factor in the algorithm because it shows the relevance and importance of the content by its citation. The exclusive content is preferred and mentioned by the

other sites. The content mentioned in the category exclusive brings notoriety and many external links for a news site. Thus the positioning algorithm is invoked. The content relevance works with the algorithm factors and their steps.

In this situation, the first two news sites in the Google ranking and audience traffic ranking based on their content have numerous internal links and few external links.

Also, the number of followed linking domains and the total of linking domains differ, and they are not proportional to the news site's position in the ranking. Thus, the news site ranked second on Google has the most URLs, meaning that this site has the best content on the web in its category. This work-in-progress paper will be completed with data about more news sites in the Romanian media landscape, not only a niche group. Using this new database, we will do more correlation analysis.

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Art, media and digital platforms: the Virtual Museum of Lusophony on the Google Arts & Culture[1]

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Abstract. This study focuses on the Virtual Museum of Lusophony, on Google Arts & Culture, as a digital platform capable of providing a space for collaboration and preservation of the cultural, artistic and scientific patrimony of the community of Portuguese-language countries. In order to achieve the proposal, the theoretical discussion begins with virtual museums, art and technology reflections. In the second stage, about cultural resistance, Lusophony and multicultural globalization. To complete this study, the exhibition "Malangatana: the legacy of the Mozambican artist",

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will be presented and analyzed according to the theoretical proposal.

Keywords: Culture · Technology · Virtual Museum of Lusophony · Resistance · Patrimony.

Introduction

The Virtual Museum of Lusophony, as a digital platform available on Google Arts & Culture since 2020, can be considered a tool for the promotion and preservation of the cultural, artistic and scientific patrimony of the community of Portuguese-language countries. Formed by countries which have Portuguese as official language, this community is formed by: Angola, Brasil, Cabo Verde, Guiné–Bissau, Moçambique, Portugal, São Tomé e Príncipe and Timor-Leste. The Spanish region of Galiza and the Chinese administrative region of Macau also take place at this group.

One of the Virtual Museum of Lusophony's missions is to defend the cultural diversity in a context which the globalization of technological-financial bases – cosmopolitan globalization (Martins, 2015) – is established in a hegemonic system, following mainly neoliberal principles and ignoring the heterogeneity of cultures. According to Martins (2015), guided by the desire to build and maintain a culture of unity, cosmopolitan globalization can be logocentric, ethnocentric, imperialist and colonialist, marked by exclusion, assimilation and the destruction of differences. The author proposes that the countercurrent of cosmopolitan globalization is the

multicultural globalization, made by the union of people from distant areas, respecting the differences between them. In the community of Portuguese-language's case, he suggests that countries should remain connected in a movement of mutual cooperation, sharing Portuguese as an official language, but always being aware of the other languages, dialects and cultural habits that are part of them (Martins, 2015).

To understand how the Virtual Museum of Lusophony can work at these terms, this investigation focuses, at the first stage, on comprehend the virtual museums on Google Arts & Culture. At the second point, this study promotes a theorical discussion about art, culture and technology, according to theories by authors as Walter Benjamin, Raymond Williams and Moisés Martins. In the third stage, a reflection of culture resistance, Lusophony and multicultural globalization is presented. The creative process of the exhibition "Malangatana: the legacy of the Mozambican artist", is analyzed to complete this study, understanding how the Virtual Museum of Lusophony goes beyond the simple definition of virtual museums. Through an artistic curation, the exhibition that doesn't focus only on artistic objects, but on Malangatana's political legacy, helps to preserve memories and identities.

1. From virtual museums to the Virtual Museum of Lusophony

How can we think about museums today? Besides the physical museums, there are currently virtual museums, without walls or borders, open twenty-four hours a day.

There is no need to walk to them. They are just a click away. To understand better what virtual museums are, it is important to go back in time to realize that the term virtual museum, mentioned for the first time in an article by Tsichritzis & Gibbs dated 1991, during the International Conference on Hypermedia and Interactivity in Museums (ICHIM), hasn't much in common with a virtual museum today. Tsichritzis & Gibbs (1991) named virtual museums as catalogs available on the internet, but they did not define a theoretical concept for the term. It is pertinent to say that, in 1991, the internet was not a widespread technology in social terms and belonged to the university environment and at an experimental level.

Another author using the term is Pierre Levy (2000). According to him, virtual museums were nothing more than "bad catalogs on the internet" (Lévy, 2000: 202). At the time, there was a fear that physical museums would lose audiences due to the excessive virtualization of collections. Once works of art were available online, visitors would no longer visit museums to see the physical work. Nonetheless, the idea of museums regarding the virtual environment started to be connected to advertising and internet pages served to publicize the collections and generate a certain curiosity, making the virtual visitor a real visitor. As times passed, it was realized that one situation would not be able to cancel another one, and that virtual museums would never replace physical museums. According to Lima (2013), virtual museums can be defined into three categories: physical museums with virtual correspondence, physical museums whose works have been digitized and are available online and exclusively virtual museums.

From the pioneering use of the term by Tsichritzis & Gibbs (1991) to the implementation of Google Arts & Culture, almost twenty three years have passed and there has been a lot of improvement. The Google Art Project, the name of the project before Arts and Culture, was inaugurated in February 2011, and virtualized the collections of museums such as: MoMA, in New York (United States of America), the Galleria Degli Uffizi, in Florence (Italy), the Museo Reina Sofia in Madrid (Spain), the Van Gogh Museum in Amsterdam (Netherlands), among others. The first idea was to digitize the collections of the world's museums, in order to popularize the collections and offer visibility to those who didn't have the opportunity to be in a specific location.

The Google Art Project's mission was to democratize knowledge by disseminating works of art and their artists. Thousand works of art were virtualized in high resolution (gigapixels), which allowed us to see the work in detail, what sometimes was not possible even in person. A different perspective on the work of art was established. Google Art Project also included visits to galleries, in three hundred and sixty degrees and using Google Street View technology, a resource launched in 2007 that provides panoramic images of three hundred and sixty degrees horizontally and two hundred and ninety degrees vertically, enabling greater detail and other angles of vision. Currently, Google Arts & Culture focuses on the immersive experience with the aim of developing another way of experiencing art and culture through an immersive and expanded aesthetic in which the sensorial experience is extremely valued.

Nowadays, the Google Arts & Culture continues to emphasize that their initiative is not commercial but focuses

on: "Preserving and making art and culture available to anyone, anywhere" (Google Arts & Culture, 2023). As time passes, the project seeks new ways to access art and culture, valuing history and cultural heritage. Besides "Culture in 360º" and virtual tours with Google Street View, the digital platform has new tools for the website and mobile app. Among them are the "In-painting-tours" (guided tours in a painting to show details and reveal histories aspects), the "Art Selfie" (you can take a selfie photo and find your "doppelgänger" among several artworks), the "Nearby" (tool that can help you to find cultural events and museums close to your geography location), the "Art Palette" (research artworks based on colors), and others. Google Arts & Culture has open space for new partnerships and those who are interested can contact them through the website (Google Arts & Culture, 2023).

The Virtual Museum of Lusophony integrates the Google Arts & Culture platform and is part of this context of immersive and expanded experience using photographic images, videos and the geolocation system from the Street View tool, which allows you to frame history, a narrative, at your real scenario. The Museum was founded in 2017, under the direction of Dr Moisés de Lemos Martins. Created through an initiative of the Communication and Society Research Centre (CECS) at the University of Minho, the museum works as a project to make available and preserve the cultural, artistic and scientific patrimony of the community of Portuguese-language countries. Currently, the Virtual Museum of Lusophony is under the direction of Dr. Isabel Moreira Macedo.

The Museum mission is to spread knowledge through various forms, whether artistic, cultural or scientific expres-

sion. With the objective of gathering, preserving and disseminating this knowledge globally, Martins (2015), reiterates that interactive and hypertextual digital communication is capable of providing a favorable environment for the construction of a common Portuguese-language virtual space. According to the author: "The Virtual Museum of Lusophony constitutes, in this way, a mobilizing experience of intercultural communication, mutual knowledge and reinforcement of the sense of community in the space of Lusophony" (Martins, 2015: 31). When launched on the Google Arts & Culture platform in September 2020, the Virtual Museum of Lusophony presented two fifty-six works of art, including one hundred and twelve photographs, ninety-eight radio programs, forty-four multimedia exhibitions, nineteen films and two documentaries.

2. Technology, art and digital devices

Raymond Williams was critical of technological determinism and rejected accounts of the "social effects of technology". Contested and revisited since the 1970s, the "flow" concept developed by Williams, was overcome as radio broadcasting gave way, as the author himself had already predicted, to other communication systems, nevertheless, Graeme Turner explains the relevance of remember Raymond Williams formulations to think about the emergence of the digital (Serelle, 2016).

According to Turner (2016), despite the optimism that the web generated, it demonstrated vulnerability to the same trends that shaped the structure of traditional media. According to the author:

> In this enthusiasm for technological potential as a new device appears, much of the discussion on new media has neglected these variations. Paradoxically, as much of the enthusiasm for the digital world was based on what was seen as the potential to empower common people, this enthusiasm was also based on assumptions that are, deep down, technologically deterministic (Turner, 2016: 10).

Márcio Serelle explains: "To reflect on the constitution of a technology as a cultural form, within a society, and on the possibilities of appropriating and redirecting the uses of this technology, was important for television as we know it in the 20th century, and it seems be now for the internet" (Serelle, 2016: 197). Therefore, the contribution of Raymond Williams becomes even more relevant to avoid mistakes that end up being technologically deterministic. According to Williams, changing these emphases requires prolonged and collective intellectual effort, as these are issues that bring with them other developments that mask more complex and difficult philosophical and historical questions.

To think about new technologies, it is almost inevitable not address aspects inherent to historicism, as if a technical object were necessarily replacing the previous one, in a process of technological obsolescence. Nevertheless, we should not stay on the idea that the dark chamber would have given way to the photographic camera or that this technology would have been replaced by cinema. As can be inferred, this is not what happens. More than a hundred years later we have both cinema and photography, and they both are in the process of evolution and other social uses.

The idea of obsolescence of technical objects leads us to the thought of a "false illusion" that we are experiencing a

technological revolution. The historicistic thinking narrates in a linear way the emergence and obsolescence of technology, when, in reality, it is relevant to think about the social, scientific and economic moment of the time in which such technologies emerge. In such a way as to realize that without this tripod (society, science and technology), objects do not have the proper reception and use by people. In this way, it can be inferred that evolution is not in the object itself, but in the social use given to the socio-technical object. Latour (1994: 15-16) questions the concept between the modern and the archaic, in which the use of the concept of modernity would be related to the technological revolution, signaling a rupture in time and conditioning modernity to a form of improvement of the old regimes.

Michel Foucault is one of the first theorists to think about devices. Based on Foucault's philosophy, Gilles Deleuze (1990: 155) points to technical objects as elements of agency, devices capable of modeling, controlling, directing or managing social behaviors. Machines that make people see and make people talk. According to the author, devices can be considered as a set of practices of knowledge, power and production of subjectivity.

> The first two dimensions of a device, or those that Foucault highlights first, are the visibility curves and the enunciation curves. What is certain is that the devices are like Raymond Roussel's machines, machines for making people see and make them speak, as analyzed by Foucault (Deleuze, 1990:155).

Walter Benjamin (1987) developed one of his theories about "the optical revolution, inaugurated by the camera, a new vision machine" (Martins, 2015: 48). The philosopher

thought about the photography camera and wrote about the cult of the "inaccessible work of art" and how a technical device would enable new perspectives, modifying the creation, circulation and representation of art. According to him, contemporary art, in its political dimension, will be more effective when reproduced (Benjamin, 1987:171). The author reflects on how art and politics are connected and how the era of technical reproducibility would be beneficial to make this connection between art and politics even more intense.

> The means of our time, at the beginning of the third millennium, are in digital technologies, in the hybridization of ecosystems with techno systems and in the inextricable absorption of scientific research into artistic creation, all of these opening unprecedented horizons for the artist to explore new territories of sensorially and sensibility (Santaella & Arantes, 2008: 39).

The devices would be capable of highlighting other forms of subjectivity production. Subjectivation processes do not follow rules or models. Each society, era and technology have different processes. After the 2000s and with the advent of the internet, devices are increasingly socially present in the form of cell phones, surveillance cameras, GPS, among others. According to Bentes (2005: 2), these devices can be capable of altering human cognition and perception, thinking about the mathematical modeling of information launched by Marvin Minsky. To this perspective, such devices connected to the internet would be capable of altering the subject's perceptions and brain functioning. If devices can change perception and socio-communicational praxis, it is relevant to think about how virtual museums, such as

the Virtual Museum of Lusophony, would contribute to a new status of the image, based on new socially modeled practices and knowledge.

Santaella (2009), emphasizes the importance of the new experiences with technological advances to the creative processes of the production of art. According to the author, in the contemporary times, digital technologies have led to the emergence of hybrid art languages. Exploring new territories means meeting new digital media. This provokes new experiences for the artists and also for the public in general, now with new ways of feeling and experiencing everything, that occur through interaction. Therefore, it´s necessary to remember about Williams (2003), when he explained why technology and society cannot be thought separately in these terms. The connection between both must always be remembered.

3. Cultural resistance and the Virtual Museum of Lusophony

In the same way that there were economic and technological investments on sound broadcasting, there were interests of the same nature on visual broadcasting and also on the internet, nevertheless, although "enormously powerful", the political and economic ideals are not "omnipotent" as Roger Silverstone (2003: 15) explains. They function as pressures that act on the uses and development of technology and not as "prescriptive and controlling forces". Williams (2016) explains the pertinence of decisions and resistance actions arising from critical thinking with the aim of developing a society capable of organizing itself in the search of more effective communication in different

areas, elucidating new possibilities of alternative uses for technology by small communities.

In "A razão comunicativa nas sociedades avançadas", an article by Moisés de Lemos Martins published in 2005, the author reminds us that: "The development of the cultural industries (computer products, multimedia – television, telephone and integrated computer -, advertising, fashion, music, dance, tourism and holidays) has made mass culture hegemonic in our time". Understanding that as much as the area of Communication is influenced by liberalism (more precisely, neoliberalism at this moment) and that the holders of technological resources and knowledge are always ahead, controlling through power relations what is said and what is not said, done and not done, there is still space for criticism and urgent debate about the role of resistance in what Martins (2005) defined as: "the serious political problem of a new democratic space". The debate on the political problem of a new democratic space is related to the fact that it is necessary to think of alternative ways. On how to use networks, connections and digital platforms to unite people for common ideals and dreams across the globe, breaking geographic limits, valuing and preserving heterogeneity.

Once speaking of Lusophony and the passion invested in this theme, Martins (2015: 11) expresses the existence of "multiple lusophone imaginaries" and not a single imaginary. The lusophone community is built by plurality, difference and continuous knowledge about each other. The idea of lusophony defends multiculturalist globalization and exists through it.

In a field of knowledge and powers in which the hegemonic discourse is the discourse of uniqueness, which directs

us towards a world-culture, the ideal of building a lusophone community wages a symbolic struggle against the hegemonic logic. It is a path that leads us to transculturality. This struggle is aimed at valuing the heterogeneity of people and portuguese as a language of science, learning about ourselves and others, artistic expressions, cultural practices and also towards partnerships that enable the human and economic development of these countries.

Bourdieu (1989) strongly points out that the world has a symbolic order, and this becomes even more evident in a globalized world, in which the distinction occurs along three main axes: technology – economy – common language. The internet and the socio-technical networks, as a technology capable of changing the notion of time and space. The economy, as the main engine of symbolic exchanges. The English language, as a common and hegemonic language, in which North America and Europe are judged as producers of a superior culture, while Latin America, Africa and Asia (with the exception of Japan) would be like a kind of periphery of the world (Martins, 2021). Although Portuguese is the official language in African countries such as Angola and Mozambique, these countries have other languages and dialects.

Martins (2015, 2018, 2021) criticizes the Anglo-Saxon hegemony in scientific publications. In this context, even if the project is geographically located in Portugal (Europe), the Virtual Museum of Lusophony is counter-hegemonic since it is dedicated to the Portuguese-language community. Mignolo & Walsh (2018: 159) believe in interculturality as a tool for the reorganization of diverse cultures and identities. The authors also believe in the development of inclusion policies for knowledge and cul-

ture, in a counter-ordination to the sociocultural, economic and political hegemony of the social order as a whole, so that all sectors of society would be involved. In this scenario, interculturality is more than the interrelation and dialogue between cultures, it is a way of decolonizing through a radical change in the dominant order (modern and capitalist).

4. The exhibition "Malangatana: the legacy of the Mozambican artist"

Malangatana Valente Ngwenya was a mozambican artist who produced important works of art such as drawings, paintings, sculptures, poetry and music. Besides being an artist, he was a member of the FRELIMO (Liberation Front of Mozambique) and a defender of cultural, social and political causes. One of the most important artists of the world, Malangatana was born in Matalana, Maputo province, in 1936.

An artist with multiple talents for working with different artistic languages, Malangatana also had talent for teaching art. The artist thought that children were the future and hope for the renewal of Moçambique, which is why he dedicated so much time to teach young people and provided possibilities for the development of his local community.

"Malangatana: the legacy of the Mozambican artist", at the Virtual Museum of Lusophony, on Google Arts & Culture, includes photographs from the exhibition "Colors of Mozambique", made by Simone Faresin, and the documentary, "On the Malangatana Trail: from Legacy to Memory"

(2018), produced by the researcher Dr Lurdes Macedo. The permanent exhibition on the Virtual Museum of Lusophony was made using Google Arts & Culture tools, such as those that offer the ability to develop a hybrid exhibition in media formats and zoom in to discover extraordinary levels of detail.

The exhibition starts with the documentary about his life and legacy. The beginning of the documentary is dedicated to show the "Sacred House of the Mabyaya Family", a work of art, many meters high, made up of a set of sculptures, located on the outskirts of the city of Maputo. Looking at this work of art, it is possible to observe how Malangatana had the ability to work in various artistic spheres. The work, inaugurated in 1989, was dedicated to the family that controlled the territory between Matalana and Zimpeto. The Mabyaya family reigned from the village where Malangatana was born, to the place where the sculpture is today. The initial project was smaller, but the artist transformed it into a larger one, where pieces designed by him in metal were placed in the structure, over the course of three years. Nowadays, the artwork is without any maintenance and needs to be restored and placed in another place, where young students and admirers of Malangatana's work can have access. To achieve this, the community needs resources.

The documentary by Lurdes Macedo presents how Malangatana's art is also a work of social intervention, and the "Sacred House of the Mabyaya Family" it´s the beginning of the journey, with approximately twenty five minutes, that the producer will guide us. The documentary is made up of images that show where the artist was born and worked. It also shows archive images of his life, the construction

of his works, moments of interaction with the local and international community, and interviews with people who shared their memories, such as Richard Gray, an expert on Malangatana's life and work. Some of the artist's works are also shown in this documentary, which also tells how Malangatana contributed to the internationalization of Mozambican art.

After the documentary, we can see eight images from Simone Faresin's exhibition, "Colors of Mozambique". The photographs are the result of Faresin's experiences in Moçambique and the proximity he established with the work of Malangatana. The images show Malangatana's artwork from the photographer's point of view. Faresin portrayed drawings, paintings and sculptures that show us faces and creatures, fauna and flora.

Simone Faresin's photos show the amphitheater, one of the most significant buildings in that region, a space for presentations and transmission of knowledge. In his photos, we can see details of Malangatana´s work, like monsters, for example, which look like mythical creatures, with large claws, pointy teeth and red eyes. The way the artist portrayed the people can also be seen, with striking eyes, hands, mouths and breasts. Observing the presence of strong colors, we see how Malangatana mixes the shapes of monsters, nature animals, elements of forests and people who make facial expressions of fright.

Secco (2003) explains that Malangatana's paintings show cultural diversity in constant interaction, influenced by ancestry, wars and invasions. According to the author, this can be seen through the use of red and monstrous figures. Another important characteristic is the strong presence of women in his paintings and drawings. Many of these details of the

Malangatana's universe is represented in Simone Faresin's images that are now in the Virtual Museum of Lusophony, on Google Arts & Culture. Malangatana's legacy goes beyond what can be seen by our eyes. The artist was very active, a supporter of social causes who presented his community to the world. The exhibition, now on Google Arts & Culture, can contribute to the preservation of the artwork of Malangatana, giving more visibility to the need for interventional work to preserve the legacy that needs artistic restoration. The documentary initiative and also the photo exhibition bring a complementary dimension, showing cultural heritage through interviews, chosen and sequenced archive images.

Conclusion

This study was focused on demonstrating how the presence of the Virtual Museum of Lusophony, on the Google Arts & Culture, collaborates with the promotion and preservation of the cultural and scientific patrimony of the Portuguese-speaking community, in a context marked by the globalization of technological-financial bases, that guides us along a unique path, ignoring the existence of multiple histories and using cultural diversity for marketing purposes.

In this context, it is necessary to think about ways of making the new virtual platforms become heterogeneous spaces, consequently going against the current of individualization that neoliberalism generates through the weakening of communities in favor of economic growth that does not benefit minorized peoples. It is also one of our objectives with this study, to invite the scientific community and civil society to debate on the importance of

resistance and criticism in order to be able to defend and protect patrimony, languages, cultural and diverse artistic expressions.

Through exhibitions of photographs, illustrations, radio programs, films and other types of media resources that bring interactivity to visitors, the Virtual Museum of Lusophony is capable of get to know multiple imaginaries of the portuguese-speaking countries, formed by different cultures that, through respect and mutual knowledge, can collaborate with each other. As a research and intervention platform of the Communication and Society Research Centre (CECS), and Cultural Unit of the University of Minho, the Virtual Museum of Lusophony can also promote the production of scientific knowledge about the cultural expressions of these countries. This study is one of the results of this incentive.

The Virtual Museum of Lusophony demonstrates that a virtual museum is not just a catalog of works of art. It is a museum that preserves and makes art available around the world, providing opportunities for people to discover artists from diverse context, without geographical limitations. With the use of diverse resources and hybrid languages, the experience with the exhibitions became more complete, revealing details and providing more information. The fact that we can share this content with other people around the world, is also a positive factor for the preservation of memory and cultural heritage.

The Malangatana exhibition reveals not only the cultural diversity of Mozambique, but also the importance of social intervention in communities through artistic expressions. Malangatana's artistic work contributed to the internationalization of Mozambican art and left us an

inspiring legacy. The images by Simone Faresin and the documentary by Lurdes Macedo bring interesting points of view to the Virtual Museum of Lusophony, as both found, each in their own way, the beauty and strength of Malangatana. Having this exhibition on Google Arts & Culture, available to people around the world, is very significant for strengthening the Portuguese-speaking community.

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Competitive Photography and Digital Inequality: An Analysis of Instagram's ipostghana

Lawrence E. Wood

Abstract. This research is a comparative analysis of what are termed "competitive" photos included on the ipostghana Instagram page in 2016 and 2022. The results indicate Ghanaians accounting for less than 30 percent of competitive photos in 2016, compared to accounting for more than 75 percent of such photos in 2022. The results further suggest the possibility of an increase in digital cultural production and dissemination among people living in digitally marginalized regions of the world in recent years, shedding some positive light in a contemporary context where digital inequalities nonetheless tend to persist.

Keywords: digital inequality · mobile photography · competitive photography · Instagram · digital divide

Introduction

With approximately 2 billion registered users worldwide, Instagram is perhaps best known as a social networking platform for selfies, influencers, and advertisers. However, a relatively small but nonetheless substantial number of people utilize the site primarily, if not exclusively, to disseminate their artistically oriented photographs. Thus, amidst the selfies and daily life scenes typically found on Instagram there are also photographs that are more artistic in nature. Many of these photos are taken by amateurs often utilizing only mobile phones and free editing apps, yet their photos can be as aesthetically compelling as those of professional photographers.

In conjunction with these matters, daily theme-based competitions operated through Instagram accounts such as *gramoftheday* offer amateurs the opportunity to have their photographs viewed and appreciated by a wider, global audience, rather than just the individual's followers. Along these same lines, a variety of Instagram accounts are dedicated exclusively to reposting photographs taken by other Instagram users. Such accounts often focus on a particular topic or genre, such as wildlife or black and white photography, or are devoted to reposting photographs taken in a specific region or country of the world. These accounts are curated by one or a small number of editors, and Instagram users employ specific hashtags associated with these accounts in hopes of having their photographs reposted on these sites.

Instagram users can have various motivations for having their work reposted on other accounts. In general, they stand to have their photographs exposed to a wider audi-

ence – potentially a much wider audience – than would otherwise be possible. Some amateur photographers hope that the recognition they receive may eventually lead to professional opportunities. For others, simply receiving recognition for the quality of their photos can be satisfaction alone. Garnering appreciation for the quality of their photographs can not only improve confidence in their photography skills, but it can also presumably lead to greater confidence in pursuing other artistic and professional endeavors.

In short, sites like Instagram afford virtually anyone, including people using only a mobile device, the opportunity to share their artistic photographs and to receive widespread recognition in ways that did not exist just a decade ago. While websites such as Flickr offered somewhat similar opportunities dating back to the early 2000s, in conjunction with the growing ubiquity of mobile photography over the past decade, the amount of Instagram's users worldwide has dwarfed that of similar photo sharing sites for a number of years now.

Creative Content and the Digital Divide

While the term digital divide initially reflected concerns in the 1990s regarding access to the Internet and computers, scholarly research soon gravitated towards the understanding that the digital divide is more than simply access to computers and the Intern*et alo*ne (van Dijk, 2006; Warschauer, 2003; Yu, 2006). While access to the Internet, broadband, and computers have always remained defining characteristics of the digital divide, starting in the early

2000s scholars began more steadily noting that the sophistication of technology use should also be understood as a defining characteristic of the divide (Warschauer 2003; Yu 2006; see also Wood & Howley 2011). These concerns were characterized in various other terms as well, such as referencing the participation gap (Jenkins *et al.*, 2006). Overall, whether in terms of access or use, factors such as age, race, income, and location have always typically been understood to shape technological divides (Eynon 2009; van Dijk 2006; Warschauer 2003; Yu 2006). Often it is a mix of various demographic and socio-economic phenomena that contribute to digital divides in any given context.

Along these very same lines, the production and dissemination of creative content can be influenced by digital divide types of phenomena (Hargittai & Walejko 2008; Mihelj et. al, 2019; Schradie, 2011). The same types of barriers that lead to digital inequalities more generally can similarly affect the production and dissemination of creative content such as music, writing, and photography (Hargittai & Walejko 2008). Thus, despite digital content production being seen as presenting new and powerful opportunities, not all individuals are equally positioned to take advantage of such opportunities (Mihelj et. al, 2019). As technology continues to evolve, discouragement or difficulties leading to limited use of new communication technologies can perpetuate, or even exacerbate, existing social, cultural, and economic inequalities.

Based upon the author's previous experiences with posting artistically oriented photographs on the types of niche Instagram accounts as described above, it was apparent that some Instagram accounts tended to disproportionately include photographs from users living in more affluent

parts of the world. For example, it seemed that artistic photographs being reposted on various country-specific Instagram accounts – and in this case accounts associated with developing countries in particular – were disproportionately from Instagram users from more affluent countries elsewhere. Thus, despite the emerging opportunities as previously described, the photographs being highlighted on such accounts evinced a digital divide.

To more formally test this matter, the author conducted a content analysis of photos included on one of these types of sites – the *ipostghana* Instagram page. The ipostghana account is typical of the types of Instagram feeds that focus largely, if not exclusively, on artistic photographs of a particular location. It does so by reposting images of other Instagram users who have used the #ipostghana hashtag, where the obvious intent is having their photos reposted on the Instagram page. To more formally analyze digital divide related patterns or trends, the author compared 100 photos on the ipostghana Instagram account during a period in 2016 and 100 photos posted on the account during a period between 2020-2022 (hereafter referred to as 2022). Photographs were coded in relation to various categories as described below, and they were also coded for the original photographer's country of origin.

Methods

A conventional content analysis methodology, as outlined in various seminal and influential works on the matter (Berelson 1971; Holsti 1969; Neuendorf 2002; Weber 1985), served as the basis for this research. The research was

designed to compare photographs posted on the ipostghana Instagram account over two discrete periods of time. Like a substantial number of Instagram accounts, ipostghana does not include its own, unique photos, but instead utilizes photos from other people's Instagram account to populate its page. The page relies upon one or more editors to curate and repost the photos, and credit is given to the photographer who initially posted the photograph.

Each photo included in the study was coded by the original photographer's country of origin as well as being in one of four mutually exclusive categories of photographs: casual, professional competitive, amateur competitive, or advertisement. These codings were based upon categories identified in somewhat related research (Manovich, 2016; Manovich, 2019; Tifentale, 2016). The characteristics of each of these four types of photos are included in Table 1, while Figure 1 includes examples of photos included in the research from each of the four coding categories.

To further elaborate on each of these coding categories, *casual* photography can be understood as the types of photographs that Instagram users are most likely to post and that are responsible for Instagram's overall popularity. Examples of these photos include selfies, photos posted exclusively for family and/or friends, and vacation photographs that aren't primarily concerned with aesthetic elements associated with artistic photography. These photos can be understood to be similar to what has historically been conventional, personal photography (Manovich, 2016). Also included in this category were what can best be described as the occasional casual business photo. These photos were not formal advertisements from a business, but nonetheless promoted a business interest.

Casual	Personal photography, including the types of photos taken prior to the proliferation of mobile phone photography. Created for friends, family members, but not a wider, unidentified/anonymous audience. The content of the photo is prioritized over aesthetics. Also included reposts from celebrity accounts and photos that were not formal advertisements but were clearly promoting a business interest.
Professional Competitive	The account belongs to a commercial photographer. The photo may be to promote business interests (such as wedding photography), or as a means to sell photographs, or as a means to disseminate work to build reputation. Photos demonstrate attention to things such as aesthetics, elements of fine art photography, and taken by someone who is, to some extent, a practicing professional photographer of some form. Ostensibly competing more with other commercial photographers rather than amateur photographers. This category included reposts from organizational accounts (such as UNICEF) where photo taken by professional photographer, as well as reposts of photographs taken by a deceased, well-known professional photographer.
Amateur Competitive	The Instagram account of the original photo belongs to an amateur photographer. The photo is typically made for public display and may be a means to try to build a reputation as a photographer or as a way to eventually become a commercial or professional photographer of some form. Photos are often entered in daily and/or juried competitions. Photos demonstrate skills as a photographer, paying attention to things such as elements of fine art photography, aesthetics, and can often have stylized and contemporary looks. These photographs may be appealing to a wide audience.
Advertisement	Photos coded as "Advertisement" were clearly advertising a product, with clearly recognizable elements of an advertisement, including things such as photos of a product, links for purchasing a given product, and so on. These photos were on the account perhaps as a means for the host account to earn financial support.

Table 1. Characteristics of Photos by Coding Category

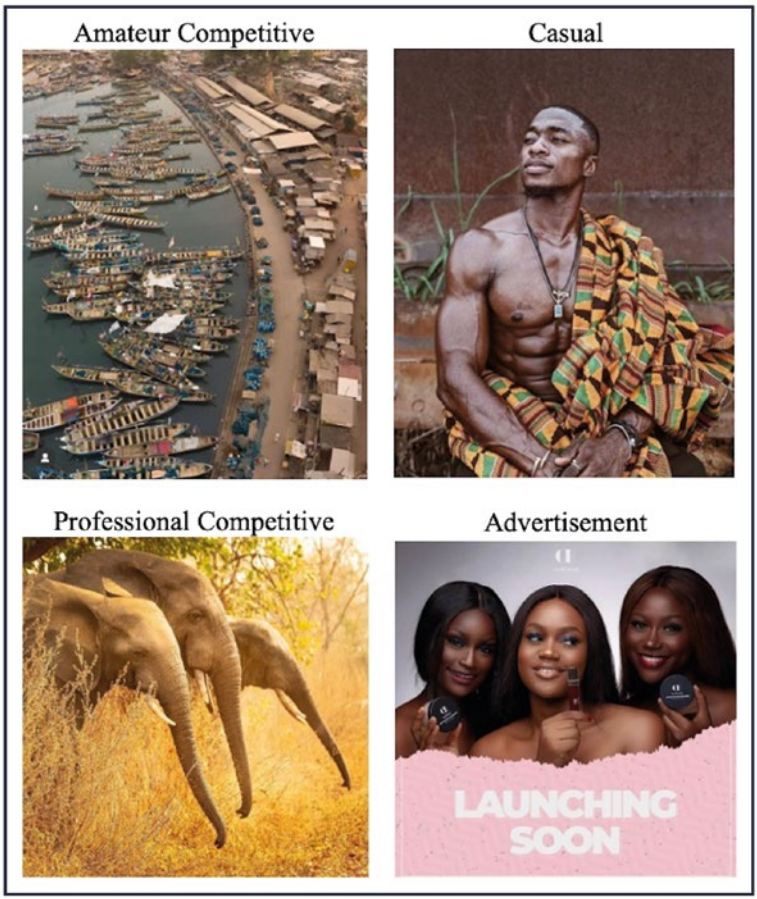

Figure 1. Samples of photos included in the analysis by coding category

A second coding category was *professional competitive*. These reposts were photographs from commercial or professional photographer accounts. It was typically clear that the photographers had drawn upon artistic elements

of photography in composing and editing their photos. In some instances these types of photos were posted ostensibly as an attempt to create business opportunities for the original photographer, such as for wedding photography. A third coding category was *advertising*, which were photos clearly for advertising purposes.

The fourth category, and the one of particular importance to this study, was *amateur competitive*. These photos were reposts from non-professional photographer accounts, but were distinct from photographs coded as casual in a number of ways. The amateur competitive photographs demonstrated skills and aesthetics typically seen in professional or artistic photography, with their appearance often escaping assumptions of being a photograph taken by an amateur. Furthermore, and as opposed to casual photos that are more exclusively posted for family or friends, amateur competitive photos are posted primarily, if not exclusively, for the public display of artistic skills and qualities. As summarized by Tifentale (2016), these types of photos can be understood as artistic, but not the types of photos that would typically be found in, or considered a part of, the art conventional world. These photos are often posted or hashtagged as part of daily online competitions or in attempts to have their photos displayed on a niche site.

Photos were selected from two time periods, with 100 photos included from each period. The first set of photos were from May 12, 2016, to July 1, 2016, with all 100 photos from that time period included in the analysis. The second set of photos was drawn from September 1, 2020, to April 15, 2022, with all 100 photos posted on the account during that time period included in the analysis. Along with coding by type of photo, each photo was coded for

	Total	Non-Ghanaian 2016	Ghanaian 2016	Total	Non-Ghanaian 2022	Ghanaian 2022
Professional Competitive	13	4	8	30	6	20
Amateur Competitive	18	16	1	30	3	26
Casual	40	NA	NA	25	NA	NA
Advertisement	29	NA	NA	15	NA	NA

Table 2. Content Analysis Results

Note: Professional competitive 2016 total 13, 1 unclassified. Amateur competitive 2016 total 18, 1 unclassified. Professional competitive 2022 total 30, 4 unclassified. Amateur competitive 2022 total 30, 1 unclassified.

the origin of the source photographer. Particular attention was paid to whether the original photographer was from, or not from, Ghana. It was often fairly easy to identify the country origin of the photographer by going to their Instagram account, though in cases where it was not various techniques were used, such as Googling the photographer's name or scrutinizing the various hashtags included with the original photo. Due to the nature of the study, when analyzing the photos particular attention was

paid to the country of origin of the photographers whose reposts were coded as either professional competitive or amateur competitive.

Results

The results indicated a remarkable difference between the photographers included on the ipostghana Instagram account when comparing 2017 to 2022. As seen in Table 2, while Ghanaians accounted for less than 10 percent of all amateur competitive photos on the ipostghana Instagram page in 2016, they accounted for 90 percent of such photos in 2022. In both years, most of the amateur competitive photographs not posted by Ghanaians were posted by travelers from western countries. In short, the results indicated that a far greater number of Ghanaians were having their photos reposted during the more recent time period.

The results suggest the possible erosion – even if slight – into what might be considered some digital divide aspects of this type of digital content production. Though there are various phenomena that could influence these findings, the most plausible explanation is that in this context, people who were once primarily content consumers are becoming content creators as well. While a variety of factors could play a role in the changes found in this analysis, a plausible conclusion is that over the past number of years members of digitally marginalized groups, at least when considered by their location, have developed some combination of skills, motivation, and strategic communication tools that are providing opportunities for disseminating their artistic content.

Conclusion

This research was based upon a content analysis of photos included on the ipostghana Instagram account. It compared 100 photos reposted on the account in 2017 to 100 photos reposted on the account in 2022. Generally speaking, artistic photographs were coded as being either from a professional's or amateur's account, and they were also coded for the original photographer's country of origin. The results suggest improvement over time in digital cultural production and dissemination by people living in what might be considered a relatively more digitally marginalized region of the world, perhaps providing some optimism given the tendency for digital inequalities to persist, if not worsen, over time when considering various factors associated with the digital divide.

Instagram provides a platform for amateur photographers to post what is nonetheless professional-grade work – a means for artistic expression of photography that was in many ways unavailable prior to the ubiquity of mobile phones and their related apps. While websites such as Flickr provided opportunities for amateurs to share their photos to a relatively broader audience than would have been available prior to the widespread use of the Internet, mobile photography built upon this trend, influencing it exponentially. Sites like Instagram afford virtually anyone, including people using only a mobile device, the opportunity to share their artistic photographs, and receive unique recognition in ways that were simply unheard of only a few years ago. For some amateur photographers, developing a reputation through such endeavors may eventually lead to at least some level of professional activity as a photographer.

For others, while there may not be any direct, professional outcomes from such activity, receiving recognition for the quality of their photographs can improve self-efficacy in ways that may translate to improved confidence in other aspects of their lives.

Along with mobile phones presenting new opportunities for artistic engagement, as well as sites such as Instagram offering countless examples of photography aesthetics and strategies, this research suggests that over time, members of digitally marginalized groups who might not otherwise have been able to otherwise develop such skills in the past have been able to develop increased proficiencies in relation to digital cultural production and dissemination. These types of trends can be seen as especially important when considering that the creation of such content can influence, for example, the credibility of social and political agendas. Thus, while the content analyzed in this study was assessed in regards to its artistic qualities, the skills and confidence associated with creating such art can, in turn, translate to activities that can have various societal implications.

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Inside the advertising: brand communication in virtual reality

Eduardo Zilles Borba

Abstract. This work presents a mapping of audiovisual, interactive and plot engagement in brand's experiences in Virtual Reality (VR). It seeks to articulate and to raise questions about brand communication, immersive environments and user imaginary. The work starts with a theoretical approach, in order to present fundamental characteristics of VR as a medium. In a second moment, an exploratory and qualitative methodology is applied to a sample of ten advertising pieces from different brands. In short, results point to directions for the creation and/or analysis of advertising on immersive media.

Keywords: Virtual reality · Advertising · Metaverse · Brand communication · Immersion.

1. Introduction

The potential use of Virtual Reality (VR) for brand communication has proven to be increasingly important in terms of building experiences and engagement of the consumers (Kim, 2021). In fact, the immersive characteristics intrinsic to the VR modus operandi allow the exploration of creative content to be developed for digital media, not only for commercial purpose (Qin & Lei, 2019), but also to strengthen the brand's positioning regarding any pertinent social debate in a contemporary society (Borba, 2022) or even, simply, to generate a sense of belonging, participation and cooperation of people who identify with the brand's product, services, style or philosophy (Kotler *et al.*, 2017).

Based on the understanding that VR platforms produce a kind of perceptive conflict on the user's notion of reality (Slater & Wilbur, 1999), due to their characteristics of producing sensorial stimuli for immersion and mental stimulation for sense of presence in a 360-degree media context (Bolter & Grusin, 1999; Thon, 2008), this work is focused in the ways in which brands can appropriate attributes originated from (and in) the relationship among user, devices and VR environment (Kerrebroeck *et al.*, 2017; De Gauquier *et al.*, 2019). That said, the following problem is raised: how do advertising pieces in VR use audiovisual, interactive and plot engagement aspects to create imaginaries with the brand universe?

To conduct the work, initially, a theoretical approach to VR is presented, highlighting fundamental characteristics, such as: immersion (Slater & Wilbur, 1997), sense of presence (Bolter & Grusin, 1999; Thon, 2008), audiovisual realism/vividness (De Gauquier *et al.*, 2019; Qin & Lei,

2019), interactivity (Kataoka *et al.* 2019) and plot engagement in a 360-degree stage (Pausch *et al.*, 1996; Pausch *et al.*, 1997; Longhi, 2018; Kotler *et al.*, 2021).

In a second moment, as an empirical practice, an exploratory and qualitative methodology is applied to a sample of ten advertising pieces in VR. In order to verify peculiarities in the audiovisual, interactive and plot engagement composition of these pieces, it was decided to select brands from different sectors (automobiles, food, beverages, entertainment, and more). Each piece is observed individually using VR devices (Oculus Rift S, Oculus Touch and Oculus Sensor), and data is collected through descriptive notes, screenshots and, at the end of each experience, a data coding sheet is completed by the researcher (Castro Alves, 2022; Borba, 2022). In order to carry out the qualitative analysis, a table summarizing the main information verified in each of the ten experiences is formatted to consolidate the reflections in this mapping exercise of brand's communication in VR.

Addition to solving the research problem which is related to brand appropriations of VR to produce imaginaries in the advertising experience, the results point to directions to think about creation and/or analysis of advertising pieces on these innovative platforms, such as: videogames, performing arts, cinema, simulators and metaverses.

2. Creative advertising in virtual reality

Advertising practices reveal significant transformations in their actions, as advertising is increasingly involved with creative industries (video games, design, cinema, public

relations, performing arts, social media, metaverses, and more) (Zilles Borba, 2023). In fact, nowadays, brand's persuasive communication techniques go beyond formats known by the general public, such as advertisements, to seek strategic communication actions on multiplatform that encourage the use of a wide variety of media languages (video, text, sound, 2D animation, design 3D, and more).

Those changes in the medium platforms, in special the digital ones, stimulate a greater horizontal relationship between senders and receivers of the communication messages (Kotler *et al.*, 2017), in addition to strengthening the invitation to the user's participation actively in the relationship channels with any brand (Davis, 2013) and, so on, increasing engagement of communities that are interested in certain brands through open discussions on issues relevant to our society (Atem *et al.*, 2014).

In this transmutation of advertising, it is also clear that it expands beyond commercial objectives (advertising products or services), to gain a relevant space in the production of informative or entertainment content through branded content (Covaleski & Ataíde, 2023), creating of innovative creative products for organizations (Kotler *et al.*, 2021) and offering communicational representations that provide positive experiences for potential consumers with the brand representational universe (Qin & Lei, 2019; De Gauquier *et al.*, 2019; Kim, 2021).

One of the points of these intersections in advertising practices that currently generates pertinent scientific and marketing debate, especially from the moment that the company Meta signaled its interest in developing a metaverse totally mediated by VR immersive devices, is the creation of brand experiences in VR environments

(Kim, 2021). De Gauquier *et al.* (2019) complement this idea by stating that a possible way to strengthen brand's personality with the audience is producing participative experiences with opinion makers. Thus, a brand experience in VR involves sensory, affective, intellectual factors or consumer behavioral responses (Brakus *et al.* 2009 *cit in.* De Gauquier *et al.*, 2019).

From the perspective of Qin and Lei (2019, p. 74), "immersive experiences can make the consumer truly feel the quality of the advertised product, because in them the person can experience the functions of this product". So, VR advertising invites audience to delve into the content (before only seen it on a computer flat screen) to explore the space using their full body. In Zilles Borba (2020), the full body narrative is reinforced as fundamental characteristic of VR as a media, as several senses of the user's body participate in the media stage in a more complex way than a simple audiovisual flat screen content.

At this point, it is imperative to discuss some aspects related to the appropriation of the characteristics of the VR medium by advertising. In Zilles Borba (2022), for example, a proposal is presented to continue Pausch *et al.* (1996) and Slater (1999) studies, about believability in VR. In this case, the term believability indicates any (and all) complexity existing in the phenomena of immersion (Slater & Wilbur, 1997) and sense of presence (Bolter & Grusin, 1999; Thon, 2008) when both act concurrently in the user experience in VR. "Currently, believability is understood as the sum of the phenomena of immersion (sensorial) and the sensation of presence (subjective), as they act in a coalescent way", (Zilles Borba, 2023, p. 77). In order to seek ways to understand the potential for cre-

ating brand communication in VR environment, it was conducted a theoretical-practical exercise culminating in a communication structure for believability in VR based on three dimensions: realism, interactivity and engagement (Zilles Borba, 2023).

The dimension of 'Realism' demonstrates high importance in VR experiences, precisely because they simulate aspects of the visual and sound culture of the physical world within immersive scenarios, in a 360-degree field and perceived by users from the perspective of the first person eyes (scales, shapes, proportions, textures, colors, lighting and shadows). Kerrebroeck *et al.* (2017) and De Gauquier *et al.* (2019) based on empirical research results suggest visual innovation in VR provide a much more convincing sense of believability than that one mediated by flat screens of computers or smartphones. "The degree of realism is immensely higher in a 3D experience supported by the VR HMD than in a video supported by the flat screen of the smartphone, as indicated by the users who lived the different experiences", (Kerrebroeck *et al.*, 2017, p. 185).

In turn, the dimension of 'Interactivity' is directly linked to the ability of interactional devices to modulate the sensorial of the subject's physical body in their persona representation in the virtual context (feeling what their avatar feels). In this sense, the fusion between subject's natural body movements and her/his avatar (Kataoka *et al.*, 2019) could be manipulated in the experience to increase or decrease the believability of the VR experience (virtual embodiment techniques).

And, finally, the 'Engagement' dimension is linked to mental and subjective aspects of each person's experiencing the virtual context. That is, the plot proposes by the brands

in an immersive environment is absorbed in different ways by each person, because ir stimulates memories, joys, fears, curiosities and other subjective feelings (Pausch *et al.*, 1996; Pausch *et al.*, 1997). In fact, according Longhi (2018), the construction of a 360-degree storytelling in VR has potential to capture the subject's attention, whether using 360° filming techniques, emotive narratives together with virtual characters or, simply, creating missions and rankings (Thon, 2008).

3. Methodology

Considering the research problem raised to this work – how do advertising pieces in VR use audiovisual, interactive and plot engagement aspects to create imaginaries with the brand universe? – an empirical approach was applied through exploratory and qualitative methodology with ten advertising pieces in VR.

In order to verify peculiarities in the audiovisual realism/vividness, interactivity and plot engagement of those ten pieces, it was select brands from different sectors (automobiles, food, beverages, entertainment, and more). The sample was composed through a netnographic exercise (Kozinets, 2007), in which pieces were mapped because they stood out in public opinion (news, reports, interviews, social media posts, scientific articles).

Each piece was observed individually using VR devices (Oculus Rift S, Touch, and Sensors) and data was collected through descriptive notes, screenshots and, at the end of each experience, a data coding sheet was completed based on Castro Alves (2022) and Zilles Borba (2022) recommen-

dations. The analysis was characterized by a qualitative discussion, where besides evaluating the believability dimensions in a 5-points Likert-scale (realism/vividness, interactivity, and engagement), the empirical findings were crossed with theoretical aspects to construct a reflection on brand communication in VR.

4. Data analysis and discussion

After exploring the VR pieces, a table summarizing the sample main information was formatted to consolidate the qualitative analysis (Table 1).

The first think to stands out in data analysis was related to the main communication objective. It means, five of the advertising pieces in the sample had the intention of demonstrating products or services (Lufthansa, Volvo, Audi, Colgate, Sony Entertainment Pictures), while four were related to the creation of an entertainment experience (Old Irish, Oreo, Six Flags, Mountain Dew), and only one presented an innovation process by creating a VR experience to make the vaccinating act less stressful for children (Hermes Pardini).

When looking at the sample it was also evident that majority of experiences extrapolate the traditional actions of advertising to cohabit spaces of a creative industry. That is, VR as a communication environment for these brands proved to be favorable for audience engagement. So, that far beyond making an advertisement, users could actually actively participate as protagonists inside the advertising environment (through avatars), triggering the imagination about the brand universe (Pausch *et al.*, 1997; Slater, 1999).

N.	Ad title	Brand	Market	Image	Audio
1	Lufthansa VR Experience[1]	Lufthansa	Flight company	CPU and 360° video	Stereo
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		3-points	3-points	4-points	Service demonstration
2	Volvo Reality[2]	Volvo	Car company	CPU and 360° video	3D Audio
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		4-points	1-points	2-points	Product demonstration
3	Audi A4 Experience[3]	Audi	Car company	CPU, 360° video and photo	3D Audio
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		5-points	2-points	2-points	Product demonstration
4	100% Real Virtual Reality – Old Irish[4]	Old Irish	Beer	360° video	3D Audio
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		5-points	3-points	5-points	Brand personality (entertainment)
5	Virtual Reality 360°: Colgate[5]	Colgate	Oral health	CPU	Stereo
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		2-points	1-points	2-points	Product demonstration

Table 1. Data collected during the exploration to the advertising pieces in VR. Source: developed by the author

1. Lufthansa VR video available at: https://www.youtube.com/watch?v=OPRcbFrp9Y4
2. Volvo VR video available at: https://www.youtube.com/watch?v=oTCZlrturfg
3. Audi VR video available at: https://www.youtube.com/watch?v=7vdgx8aOU3Y
4. Old Irish VR video available at: https://www.youtube.com/watch?v=3-MMJ-in8AI
5. Colgate VR video available at: https://www.youtube.com/watch?v=-3PuGWFl-Sq8

N.	Ad title	Brand	Market	Image	Audio
6	PSVR – The Walk VR[6]	Sony Pictures Entertainment	Movies	CPU	Stereo
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		5-points	4-points	5-points	Movie/Product demonstration
7	Oreo Wonder Vault[7]	Oreo	Food	CPU	Stereo
		Realism	Interactivity	Engagement	Type of Experience
		2-points	1-points	2-points	Playful adventure (entertainment)
8	Superman: the ride virtual reality coaster[8]	Six Flags	Adventure Park	CPU	Stereo
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		2-points	3-points	3-points	Entertainment
9	VR Vacine[9]	Hermes Pardini	Health clinic	CPU and 360° video	Stereo
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		3-points	4-points	5-points	Service process innovation
10	Dew 360 Snow Experience: backcountry snowboarding[10]	Mountain Dew	Soft drink	360° video	Stereo
		Realism	**Interactivity**	**Engagement**	**Type of Experience**
		5-points	3-points	4-points	Entertainment

Table 1 (cont.). Data collected during the exploration to the advertising pieces in VR. Source: developed by the author

6. The Walk VR video available at: https://www.youtube.com/watch?v=7m_z2njEaSs&t=47s
7. Oreo VR video available at: https://www.youtube.com/watch?v=ENau7AkayN8
8. Six Flags VR video available at: https://www.youtube.com/watch?v=ZBY5M0bRLfo
9. Hermes Pardini VR video available at: https://www.youtube.com/watch?v=P9JwAH0298w
10. Mountain Dew VR video available at: https://www.youtube.com/watch?v=tWe8jIrrMkM

On the other hand, it was notable several of these brands did not present a proposal for discussing social causes, relevant purposes for citizenship or cultural aspects in which the communities that are involved with them are interested (Atem *et al.*, 2014). Despite offering different types of experiences, the majority of brands had a clear objective of passing on messages directly related to the characteristics of their products or services (Qin & Lei, 2019). Only two of them (Mountain Dew and Old Irish) moved away from this marketing strategy to generate immersive experiences stimulating subject's imagination and, so on, the construction of meanings about the brands (Kotler *et al.*, 2017). But, in any case, none of those pieces brought in their audiovisual realism, interactivity or plot engagement imagery constructions beyond aspects with which they wish to be associated. That is, they created entertainment pieces (Covaleski & Ataíde, 2023), but not information or education pieces about important social themes with the organization and how their products/services could be related to it (Zilles Borba, 2022).

Looking specifically at the three dimensions of believability influencing each one of the advertising pieces in VR, it could be seen that 'Realism' were the most present. The quality of the 3D design (shapes, scales, proportions, perspectives, textures and colors) received a great attention from brands when it comes to creating communication environments. The visual realism developed by Volvo and Sony Pictures Entertainment stood out in terms of believability, as through the combination of high-resolution 360-degree videos and photos, and computer graphics to create objects and interactions. Both pieces provided the formatting of a clear space understanding (landscapes, scenery) and an easy recognition of objects (car, panel,

seats, steel cable, stick, and more) with similar aesthetic to those that would be experienced in the physical world.

Although it was qualitatively recognized a high classification in the "Realism" dimension, only one brand didn't invest energies creating a realistic experience. At a first moment, it seems strange to indicate that a rating of 1-point on Likert-scale could be an excellent strategy for the brand communication purposes. But, this was illustrated in the case of Colgate, as the brand created a 360-degree visualization experience inside a person's mouth, where the effects of using oral hygiene products were demonstrated in a practical way to the user, as if she/he was a microorganism allocated inside the mouth of a third person perspective. In this case it was reflected that, in fact, moving away from the realistic composition was an adequate path, since representations of realistic bloody gums, inflammation and secretions in the inner region of the mouth of a person would cause discomfort in the user. So, all the representation was created with 2D and 3D graphics in the form of cartoons, and not photo-realistic images.

The 'Interactivity' dimension was the weakest. Indeed, the analysis diagnosed a low use of interactive resources in the advertising pieces. Even regarding the manipulation of virtual objects, only two samples provided good interaction with the user's hands, arms, legs and feet (Lufthansa and Sony Pictures Entertainment). The other pieces just allowed the user to move head and torso to direct eye-gaze freely in the 360-degree scenario. Still on the 'Interactivity', it is worth noting two pieces made a good use of the senses of the physical world (touch, thermal, proprioception and kinesthesia), in order to integrate sensations of the user's

organic body inside the virtual experience, such as: cold, heat, wind, water and burning skin (syringe, vaccine). For example, in the case of Hermes Pardini, the moment that the child saw her/his avatar in the virtual world, from the first-person perspective, she/he received a fire stone in the avatar's arm at the same time a nurse was applying the vaccine. This connection between feeling the fire in the avatar's arm and actually feeling the vaccine syringe penetrating your organic arm produced a crazy feeling of immersion, in a kind of fusion between bodies.

The 'Engagement' dimension (with the plot) played important role for the construction of brand imaginaries in the user's perception. The storytelling dynamics of several pieces significantly impacted the user subjective experience by creating moments of attention transfer with the advertising (Thon, 2008). In special, the Old Irish, Sony Pictures Entertainment and Hermes Pardini experiences presented plots in which the sense of presence was intensified. For example, when completing the Old Irish VR experience, there was a kind of feeling of teleportation to Ireland, since all the landscapes, nature, animals, cities and pubs presented in the virtual journey refer to an association from the Old Irish beer brand to the country of Ireland. No coincidence, the slogan of the advertising campaign was precisely 'the taste of Ireland'.

5. Conclusions

This work proposed to map audiovisual (realism/vividness), interactive and engagement elements of brand communication (advertising) pieces in VR. Through a qualitative

analysis, in which theoretical elements were articulated with empirical findings of ten advertising pieces, it was possible to reflect on advertising communication, narratives in immersive digital scenarios and content to enhance the user's imagination.

The use of believability in VR theory to study realism/vividness, interactivity and engagement with the plot in the field of advertising proved to be relevant as a methodological approach, since the data organization and analysis dimensions – Realism, Interactivity and Engagement – allowed to dissected pieces.

Even with a limited sample of ten advertising on VR platforms, it was possible to list conclusions that help to solve the research problem. Regarding the 'Realism' dimension, which dealt with audiovisual of the communication pieces, we can see a strong inclination of the advertising sector to value aesthetic, visual and sound design experiences. The care creating photorealistic scenarios (shapes, scales, proportions, textures, colors) reveals a high care taken by the brands. In turn, the 'Interactivity' dimension shows an absence of natural interactions to the user, which prevented a greater result of immersion. The majority of pieces did not encourage interactions, being just environments that gave to the user a privileged position of viewing the scenes. Finally, the 'Engagement' with the plot presented different storytelling approaches among the ten pieces. In some way, that enriched the reflection in the advertising context. However, at the same time, it did not make it possible to have an idea of a sure path for creating immersive narratives for the advertising sector. Anyway, it was verified the gamification dynamics could help brands to achieve their communication objectives in VR environments. After all,

experiences that presented missions, tasks or plots inviting users to participate actively in the media stage produced a sense of collaboration, involvement and community.

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Fashion through the looking glass – The new circle of production of imaginaries within the Digital world

Michele Varini

Abstract. New paradigms of digital consumption and production have been affecting the fashion industry for several years. Within this complex current various fashion brands have experimented with forays into the world of gaming. An interesting case in point is Animal Crossing, a life simulator where users act in a media context with personalized avatars. A relevant phenomenon, given the ability to customize avatars, is the production by users of customized "outfits". Methodologically a netnographic type of investigation was chosen. A visual ethnography will aim to find recurrences/dissonances with respect to mainstream fashion imagery.

Keywords: Fashion · Metaverse · Gaming · Co-production · Imaginaries · Mixed Methods · Digital Methods

Fashion, as it emerged, was undeniably a phenomenon rooted in the principles of industrial culture, consumption and technological advancements, a reality rigorously documented by the diligent work of costume scholars and sociologists who have dedicated themselves to the study of fashion over the years, since the dawn of the sociology of fashion (Crane, 2000). As fashion has evolved and transformed, it has seamlessly mirrored the rapid evolutions within the realms of media and technology. In our contemporary landscape, the fashion domain finds itself amidst a whirlwind of change, with transformative waves not only affecting communication methods, as we've witnessed the rapid transition of digital communication (such as the one from blogs to social networks), but also fundamentally altering the dynamics governing perception, representation, and self-presentation.

This digital transformation doesn't merely touch the realm of clothing; it also extends its influence to the human body itself. While extensive research and analysis of this phenomenon have primarily focused on the dynamics of influence, ranging from the impact of celebrity culture to the pivotal role played by influencers (Nannini, 2020; Muniesa, Giménez, 2020; Pedroni, 2021), and more recently, the emergence of virtual influencers (Mortara, Roberti, 2022), the discourse surrounding fashion and the digital landscape has evolved further. Contemporary discussions concerning the nexus of fashion and digital technology now encompass the expanding practices of production and consumption (Bertola, Teunissen, 2018). Therefore, exploring new modes of representation and self-representation (Mora, Pedroni, 2017) in the digital era becomes a crucial aspect of comprehending the ever-changing landscape.

This profound entwining of the fashion industry with the digital sphere has deep historical roots (Noris *et al.*, 2022). Over the years, this union has gained increased intensity, mirroring a broader trend where digital technology assumes a preeminent role not just on the economic stage but also in shaping sociorelational dynamics. The digital revolution, with its ever-accelerating dynamics, has now become an indispensable element in our lives and a linchpin in the fields of fashion production, communication, and consumption.

The ramifications, opportunities, and indeed, the threats for the production and creative supply chain, from top to bottom, for distribution, and for the traditional roles within the fashion industry (including stylists, photographers, designers, model makers, tailors, retail workers, models, to name just a few), are multifaceted. Attempting to hypothesize potential trajectories in this complex and multi-layered context, already somewhat elusive and challenging to define historically (Volontè, 2004), is a venture fraught with uncertainty and subject to criticism and opposition, not all of which can be dismissed. Throughout its long history, the world of fashion has had to grapple with the label of frivolity. This accusation, as outlined by Simmel (1895), has been one of the enduring features characterizing the fashion world until fairly recently.

In this historical context, fashion was often perceived as a form of pleasurable entertainment, albeit one closely tied to the quest for a social identity. It was perceived as a realm existing on the periphery of a more "serious" and "productive" society, centered on pragmatism, production, and traditionally dominated by men. Similarly, until recently, playing video games was mostly the domain of

those who considered themselves to be members of a subculture, often marginalised, living on the outside of both the social and economic spheres (Kirriemuir, 2006). In the always changing virtual societies, they were also looking for a social identity.

In contrast to fashion, video games have historically exuded a more male-oriented aesthetic, with marketing and the industry itself often favoring productions characterized as "masculine" or macho, and significantly gendered. However, the influence of popular media products, such as movies and TV series, over time contributed to changing the public perception of gaming, broadening the market and the audience for video games.

It is important to note that platform users and the general public observed a large rise in screen time and engagement during and after the Covid-19 epidemic, which led to a spike in the popularity of video games during the pandemic (Paschke *et al.*, 2021; Vargo *et al.*, 2021). This, in turn, amplified the economic significance of the video game industry, which was already undergoing robust growth.

The universe of video games has an extensive body of literature, deeply rooted in a long history of field studies (Wolf, Perron, 2023). The convergence between the fashion and digital domains has been explored to a certain extent in the realm of marketing and communication (Noris *et al.*, 2021), with particular attention given to collaborations between major fashion brands and video game industry behemoths (Reay, Wanick, 2023). Furthermore, a great deal of research has been done on the topic of fashion shows and digital fashion shows, which are held online or other unorthodox media contexts (Rocamora, 2017). The influence of popular media products, and the massive

proliferation of video games during the pandemic, have played pivotal roles in shifting the public perception of gaming, expanding interest and engagement.

The notable parallels between video games and fashion extend not only to the dimension of "frivolity" but also to a marked emphasis on the visual component. These likenesses have paved the way for an increasingly closer association between these seemingly disparate domains in recent years. Numerous fashion brands have ventured into the realm of gaming, characterized by distinctive imagery, rules, genre dynamics, and languages (Waszkiewicz, Bakun, 2020). An illustrative example of this convergence can be found in Animal Crossing, a gaming platform developed by Nintendo for the Switch, a "hybrid" game console designed for both on-the-go and stationary play, linked to a screen. The game functions as a life simulator, sharing similarities with the experiences pioneered by the social network Second Life back in 2003 (Amati, McNeil, 2012). Within this virtual world, users navigate, interact and engage in a media environment through customised avatars, each embodying a unique and distinct aesthetic, especially in terms of appearance and clothing.

Among the various dynamics that come into play within this game, two specific elements merit particular attention:

Firstly, a prominent phenomenon revolves around the customization of avatars. Users, and even digital artists, craft personalized "outfits," often inspired by or emulating iconic collections by renowned designers. Profiles dedicated to these digital "outfits" are shared, remixed, and reinterpreted, fostering dedicated online communities, particularly on Instagram, a platform tailored to visuals and images. Instagram is renowned as the favored space for influencers and

their practices. Here, consumers transition into producers, becoming "prosumers" (Bednarz, 2022), challenging the traditional top-down model of brand communication (Pedroni, 2021). However, in this unique universe, the focus extends beyond mere communication and marketing, encompassing elements of production "ante litteram".

Secondly, another facet of cross-pollination between fashion and the digital realm can be traced in the occurrence of fashion shows conducted within virtual environments. Numerous high-end fashion houses, such as Valentino, Gcds, and Marc Jacobs, to mention a few, have held fashion shows in Animal Crossing. These fashion brands have painstakingly created digital apparel and accessories that are immediately available for purchase in the game and made for avatars living in this virtual world. Commissioned from artists and digital specialists, these "clothes," or "skins" (Reay, Wanick, 2023), may be brand-new original works or replicas, imitations, of pre-existing collections.

To explore a field as dynamic as this one, which operates in the liminal space between online and offline, where the distinctions between the two become blurred and ultimately no longer as relevant as it has been for years (rightly or wrongly) from a hermeneutic perspective, we opted to employ two investigative techniques: visual ethnography and digital ethnography (Kozinets, Gambetti, 2020; Pink *et al.*, 2015). Our choice to adopt these methodologies is not just a pragmatic response to the innate characteristics of our subject of study but is also rooted in the desire to remain as faithful as possible to the very nature of the phenomenon we aim to dissect. This new form of consumption and production overwhelmingly centers on the visual element, pushed to its limits (Pink, 2007; Rose, 2016).

Tackling a vast and intricate arena like social media presents a formidable challenge for the social sciences. Extra care and attention are indispensable, yet they often prove insufficient. To navigate this expansive ocean of data and imagery, we decided to embark on our journey from the vantage point of an Instagram profile, "Animalcrossingfashionarchive." This profile serves as a repository of content thoroughly crafted by digital artist Kara Chung, renowned for her expertise in creating "digital clothes" using the specif tools and languages of Animal Crossing, and boasting collaborations with major fashion houses and key players in the fashion industry, including Vogue.

We sampled individuals who use Instagram for similar purposes, such posting "outfits" made in Animal Crossing, starting with this profile's followers. We kept sampling until we hit a threshold known as semantic saturation, which is the point at which sampling followers of followers produced no longer-new, different samples.

Once our dataset was assembled, we embarked on a content analysis, effectively conducting a visual ethnography with a dual purpose:

1. To categorize images into meaningful clusters, with a focus on those inspired by or replicas of real-world objects and those that are entirely novel, born from the creative faculties and imaginations of users.
2. To extract insights pertaining to stylistic and aesthetic choices and identify commonalities and disparities compared to mainstream fashion imagery.

Our approach stands as a mixed one, rooted in the intention to remain as faithful as possible to the specific

characteristics of the crossroads of video games and fashion, both heavily reliant on the visual and digital dimensions. The duality, both visual and digital, extends beyond the mere visual aspect. As highlighted earlier, the object of our research traverses two distinct "materialities", straddling two interconnected worlds on paths that prove challenging to decipher. This interdisciplinary domain, with its implications for consumption, production and the creativity behind fashion objects, seems to transcend well-trodden and well-researched paths, setting off on new and unpredictable trajectories and exploiting tools previously foreign not only to the traditional fashion industry and its narratives, but also to the sociology of fashion itself. One of the pivotal objectives of this study revolves around exploring this emergent reality: what motivates fashion consumption in this novel context? Are the traditional models from the sociology of fashion still relevant in decoding this phenomenon (Veblen, 2009)? How are products perceived, especially in terms of their artistic value? To what extent do skills and creativity factor into the recreation and creation of fashion items using these digital tools? What novelties and challenges do these digital technologies introduce to the creative and production chain?

For years, fashion sociology and fashion studies have concentrated on the interplay between digital and fashion. However, it's only recently and to a limited extent that they have embarked on the exploration of digital fashion as a distinct entity. Prior to this, the focus remained on potential collaborations and synergies between these two domains, rather than delving into their hybridization and intermingling. This work, among its many goals, endeavors to bring us as close as possible to this novel

dimension. This theater of exploration presents a challenge to numerous fields of study, both on a theoretical and conceptual level. Yet, for the sociology of fashion, it signifies a revolutionary opportunity that could lay the foundation for fresh methodological ideas. While this study primarily centers on the role of prosumers, it's evident that producers themselves are increasingly engaged in this terrain. The fashion supply chain, encompassing both material and artistic dimensions, is in the throes of significant transformation. The spectrum of possibilities is broad, spanning issues like sustainability and customization, but it also harbors numerous threats, such as the artistic value of fashion products and the professionalization of creatives. Our current work endeavors to unravel the intricacies of creativity and the visual imagery associated with this co-production and consumption of fashion in a media context, essentially envisioning a hypothetical "metaverse", a concept recently entered in the everyday language but not always defined properly. The concept of the metaverse has historically been the realm of fashion's fantasies and science fiction imaginings (Alcantara, Michalack, 2023). Never before has this new reality – or perhaps, new society – required such rigorous investigation and comprehension. As previously noted, fashion, since its inception, has closely paralleled the rise of consumer society and mirrored its shifts, at times enabling us to grasp these changes and sometimes even foreshadowing them. The analytical tools crafted by the robust body of studies within this field face an even more formidable challenge today as they grapple with a post-society, where the very materiality of objects, one of the cornerstones of fashion (Jenss, Hofmann, 2020),

undergoes a post-materiality transformation, entirely redefined and re-mediated, a kind of "no-thingness" (Han, 2022), so hard to be properly defined.

One of the most obvious phenomena that emerge from the visual data collected is that the digital "outfits" created by users mostly react to an imitative dynamic. Users like, and the majority of users prefer, emulative outputs of actual fashion objects, even if the platform allows creative activities that are completely free from the limitations inherent in practical abilities or mere materiality.

Fashion and its dynamics, known and studied in the literature of the sector since its origins, which are dual and at times ambiguous, would seem to undergo a new signification within this context so particular and, in many respects, different from the one in which fashion has traditionally operated until recent times. The "objectified" dimension of the fashion product, increasingly, especially in recent years, linked to an ostentatious dimension, a device for displaying capital that in many cases is of an economic nature, is faced with a world where the economic dimension takes second place. In this particular context, the economic value cannot be quantified as these digital products do not have a defined or clearly definable cost. As far as the economic aspect is concerned, within this community of enthusiasts there seems to be a shift towards a different paradigm, in which the dominant status in terms of fashion consumption is cultural in nature and refers to a combination of skills and playfulness, a combination of skills from both relevant universes.

Below we proceed to show some examples taken from the sample of images collected that are particularly effective in describing the phenomenon described:

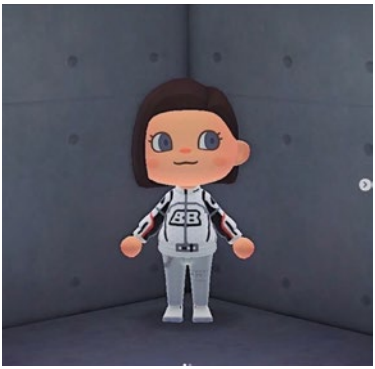

Figure 1. Photogram from the Instagram profile, Animal Crossing digital outfit #14.01 (2023)

Figure 2. Photogram from the Instagram profile #14.02, real life version (2023)

Figures 1 and 2 are just two examples of the numerous photos that follow this similar logic; these, along with all the others, are derived from the profile of follower Kara Chung, who was employed as a source in the sampling process (the data has been anonymized for purposes of

research ethics). This is a common occurrence that has numerous subtleties and recurring patterns, as the one below.

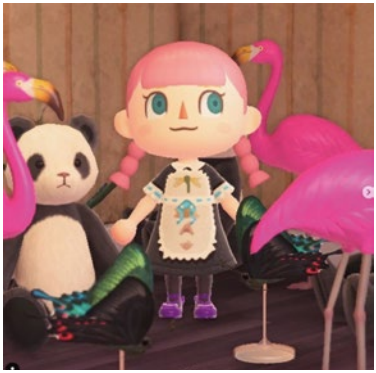

Figure 3. Photogram from the Instagram profile #108.01, Animal Crossing digital outfit (2023)

Figure 4. Photogram from the Instagram profile #108.02, real life version (2023)

It is evident that the users in question tried to imitate the products of famous high-fashion names (Balenciaga in Figure. 1 and Figure. 2, Gucci in Figure. 3 and Figure. 4).

Drawing insights from this research, it is worth noting that the results, while significant, cannot be considered fully representative due to the constantly evolving and unrestricted nature of the data on the platform under scrutiny. The examples shown so far present the same dynamic as the fashion show (which, moreover, they attempt to emulate): communication is unidirectional, top-down. A peculiarity of this phenomenon is, on the other hand, the prosumeristic dimension, in fact there are cases in which the intention of the user-designers is clearly aimed at the dissemination of their products, even if the emulative component remains.

Figure 5. Photogram from the Instagram profile #018.01, Animal Crossing digital outfit (2023)

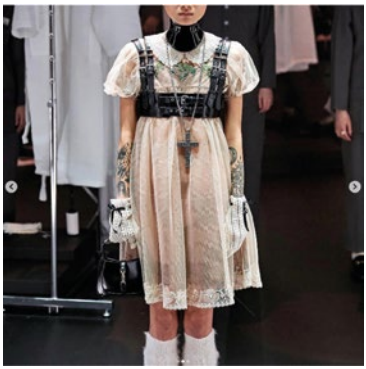

Figure 6. Photogram from the Instagram profile #018.02, real life version (2023)

Figure 7. Photogram from the Instagram profile #018.03, download code for the digital outfit (2023)

The case shown in Figures 5, 6 and 7 (again inspired by a Gucci brand product, shown in Figure. 6) has, in addition to the other examples presented, the peculiarity of allowing other users to use the digital artifact shown here in their own game environment. The dimension of sharing, free

and freely accessible, could suggest a "democratic" turn of these consumption, albeit atypical, always of high fashion, potentially with all its own dynamics. Although this trend can certainly be present, in most cases this dynamic of sharing and removing the sphere of exclusivity from fashion products does not manage to develop consistently.

In summary, the consumption of fashion, despite changes in its economic and physical aspects, continues to be a privilege of a select elite with particular intellectual and cultural backgrounds, placing economic capital largely – if not entirely – in the background. Thus, it seems that the fashion object in question is evolving, becoming predominantly an object of a cultural nature, significant for a segment of highly socialised users who creatively exploit the potential of the gaming platform to give life to garments and carve out spaces, the entrance to which is reserved for those only able to understand precisely their cultural value, in order to share them. By re-mediating these contents on other social sharing platforms that also encourage this kind of consumption (due to their social dimension), they effectively build a bridge between the virtual and physical worlds and bring traditional drivers of fashion consumption, primarily of an elitist nature, into the digital context. Ultimately, the potential for democratisation present in digital fashion, while present (as can be seen from the case shown in Figure. 7) seems to remain largely latent, as if subjugated by other dynamics, strong and capable of adapting to new mediums. These tools provide access to high-end "products" for users who are not typically able, or allowed, but they also bring with them new dynamics of in-group and out-group patterns and elitism that are primarily based in cultural differences rather than traditional material, physical, or economic barriers.

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Augmented Reality and New Ways of Seeing

glenda drew & Jesse Drew

Abstract. Augmented Reality (AR) is an interactive experience of a real-world environment enhanced by a device-based digital interaction, trigged by a marker (such as a photograph or poster), a surface (such as a room) or GPS (such as *Pokémon Go!*). The promise of AR has been around for many decades, notoriously falling out of favor with the failure of *Google Glass*. It has re-emerged in recent years, and for visual artists, it is an exciting technique to deepen and enhance the information and creative content of audio-visual artwork.

Keywords: augmented reality · public media · future photography · interactive design · digital storytelling.

Introduction

Augmented Reality (AR) is an interactive experience of a real-world environment enhanced by a device-based digital interaction. AR can be trigged by a marker (such as a photograph or poster), a space (such as a room) or location/GPS (such as *Pokémon Go!*). The notion of *augmenting reality*, though cloaked in contemporary jargon, has a long history, both in reality and in speculative fiction. Media scholar Marshall McLuhan (2016), who in many ways defined how we look at media technology, theorized the technologies of media as the *extension of the senses*.

> During the mechanical ages we had extended our bodies in space. Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned. Rapidly, we approach the final phase of the extensions of man – the technological simulation of consciousness, when the creative process of knowing will be collectively and corporately extended to the whole of human society, much as we have already extended our senses and our nerves by the various media. (McLuhan, 2016, pp. 5-6)

Therefore, anything that extends the eye, the ear, the brain, the skin, the nose, should be considered media devices. Thus, the microscope, the telescope, the telegraph, and the microphone, are in essence extensions of the senses as they work to augment our reality.

Science Fiction, Film and Art

Science fiction, which oftentimes becomes just plain-old-science, has embraced the possibilities of augmented reality for a long time. Embedded devices in our eyes, our brains and our flesh (wetware) has often been postulated as extensions of our senses, as augmenting our reality, through many science fiction stories, novels, and films. Eavesdropping audio amplifier *ears* and *X-ray* vision specs were a common sales gimmick in children's comics for decades. Horror films such as *They Live!* (Carpenter, 1988) utilize augmented reality extensively as a foundation for plotlines. In *They Live!* the protagonist sees earth's alien invaders and the meaning behind their subliminal brainwashing messages only with the aid of a particular pair of spectacles that allow the true image to become manifest. In *The Terminato*r (Cameron, 1984) augmented reality is featured as a densely integrated data field superimposed over the vision of the primary character.

Augmented Reality tools have become integrated into many other facets of modern life. Commercial and military pilots have had flight data and other information superimposed over their visionary field for many years, allowing them to see the terrain and horizon through clouds or maintain constant visionary engagement while flying. Night vision has been a military enhancement for decades. Tools for the blind allow the sight-impaired to use GPS coordinates to aurally cue them for both directions and warn them about possible impediments. Cinematic techniques have been augmented in the movie-going experience through gimmicks including 3D, Sensurround, and the laughable *Odorama* in John Waters' *Polyester* (1981).

Even sports broadcasting, superimposing the statistics, the pitch zone, and speed of the pitch, brings Augmented Reality into the home.

For many consumers worldwide, Augmented Reality is connected with the spectacular failure of *Google Glass*, which was rolled out to enormous hype, but crashed and burned soon thereafter. Regardless of the reason for failure – the roll-out was premature; the glasses were an inferior product; they were too expensive, or they were invasive and *creepy* – it was a big setback for the tech companies pinning their economic hopes on AR.

For visual artists, AR offers exciting possibilities to deepen and enhance the informational and creative content of audio-visual artwork. It also represents an exciting and inexpensive means to bring time-based moving images and audio to the public and expand the avenues to democratize information, storytelling, and artwork. While it does add a layer of technological intervention, often requiring the viewer to use their own mobile device as interface, this psychological impediment has been dissolving rapidly since the onset of Covid restrictions. Throughout the pandemic (and since) many restaurants, bars, information counters, and other public spaces replaced paper menus and informational flyers with *QR codes*, which require the interpretation use of one's own mobile device. With the urgency presented by Covid, the public adapted to this inconvenience quite quickly and today such technological interfaces are widely accepted. On its most basic level, AR can function on the same technical scenario as *QR*, with much more of an audio-visual delivery. It is only a matter of time before more sophisticated AR interfaces become popularized, such as with the use of goggles and helmets.

The adaptation of AR offers profound possibilities for visual artists, and in particular, artists who work with moving images and sound. The layers of meaning that are often woven into the structure of a film become substantially enhanced with the introduction of augmented reality. Cinema also becomes more accessible in everyday environments, as AR allows artists to embed their audio/visual work into two-dimensional public images, as well as in geo-spatial environments accessible through GPS coordinates. These innovations promise to transform cinema as we know it. AR offers formal possibilities to deepen and enhance the information and creative content by adding interactive experiences. It also represents an exciting and inexpensive means to bring time-based moving images and audio to street-based posters and flyers. For that reason, it represents to us an important means to democratize information and artwork. Thus, it becomes imperative that artists and activists understand how to harness the power of Augmented Reality.

Augmented Reality Artworks

In the rest of this paper, the authors present and discuss advantages and disadvantages of AR through their examination of their recently exhibited augmented reality installation works. The first, *EMBARKATION* (drew & Drew, 2021), is based upon the human freedom to move; the second, *THE MOVEMENT* (drew & Drew, 2021), looks at incarceration and the human spirit; the third, *future, past tense* (drew & Drew, 2022), looks at the utopian and dystopian possibilities for California in consideration of climate change.

1. EMBARKATION

EMBARKATION expounds upon a basic and profound corporeal pressure of modern life – the forces that provoke our human movement and those that constrict our human movement. Our world is simultaneously shrinking and becoming harder to traverse. Network and cellular technology allow us to effortlessly share our words, voices, and images with people around the world in virtual spaces. At the same time, a rise in xenophobia and bigotry coupled with the Covid contagion has shut down borders and restricted human movement to a level not seen before in our lifetimes. Our conscious minds may travel the globe, but our bodies are under increasing restriction. There is a powerful symbolism represented by humans gathering their possessions and embarking on a voyage, countered by the many ways humankind's movements are restricted, confined and denied.

During this extraordinary global shutdown, we as artists have been inspired to reflect on the simple act of "embarkation" or the willful movement of people from one place to another. Whether it is for promise or peril, for adventure or escape, people have embarked on journeys for millennia. On the eve of the Covid shutdown, the crisis of economic and political refugees, who were crowding onto non-sea-worthy boats to escape poverty or political repression, was a major moral crisis our world was confronting. Recently, such journeys have become even more dangerous and precarious. In our moment of *sheltering in place* we wanted to remind ourselves of the hopes and dreams represented by pushing off and heading into the unknown.

The tryptic *EMBARKATION* is comprised of three separate photographic, time-based and augmented reality works (see Figure 1). Each witnesses and contemplates the human/machine interface of a vessel, headed for parts unknown, within a moment in time.

TAKE OFF begins at the control panel of a small plane and takes off with the help of a creased and unfolded aviation map (see Figures 2 and 3). With the help of AR, the viewer sees the map morph into the actual runway seen through the eyes of the pilot. The video monitor below shows a loop of the control panel of the plane, as if the viewer is the pilot.

ROLL OFF begins behind the dashboard of a big rig and starts rolling with the help of a tired and worn road map. AR situates the viewer in consideration of time and place, hope for an unknown future as it slips into the past. The video monitor below shows the perspective and activity at the wheel of a big rig truck, as it starts moving onto the on-ramp of a major highway, preparing to merge into the traffic beyond. The viewer is placed in the driver's seat at the controls.

CAST OFF begins at the helm of a seaworthy vessel and sails off through the channels and sea-lanes of a nautical map. The viewer is placed at the controls of a ship, and sees the hands of the captain, as they begin their ocean voyage across charted sea lanes.

EMBARKATION is an experiential AR commentary on human movement, through navigational tools and means of locomotion.

Figure 1. Installation View of *EMBARKATION* (Source: authors)

Figure 2. Paper Map View of *ROLL OFF*. (Source: authors)

Figure 3. Paper Map, Video Play and Augmented Reality View of *TAKE OFF*. (Source: authors)

2. THE MOVEMENT

In contrast to *EMBARKATION*, the rising consciousness of the limits of policing and rise of the carceral state has drawn unprecedented attention to those who have lost the ability to have the freedom of movement. Whether through the long-term incarceration of people, or the bodily limitations of those held in refugee camps or border detainment centers, freedom of movement is no longer assumed to be a human right.

THE MOVEMENT is comprised of three individual framed prints on rice paper (see Figure 4). Each print contains a pixelated image generated by our custom algorithm and drawn from the words of a person writing while imprisoned. Through a layer of AR, the viewer experiences the enunciation of thoughts and the conception of images reflecting meditations on the restriction of movement and the loss of freedom. As the voice describes moments of despair, images appear from tiny pixel-particles of dust. As the voice/text ends, the pixel-particles of dust assemble and reveal the person's identity, an easily recognizable figure who embodies resilience within their confinement. In a world increasingly threatened by erosion of civil rights, environmental destruction and economic disparity, *THE MOVEMENT* presents a visual/aural display of hope, faith and resoluteness.

THE BOOTS is an image drawn from a reflection of a memory of someone in a dark prison cell who can see free citizens walk by in boots. *THE BOOTS* contrasts the freedom of motion of free people with those who have lost their freedom.

THE PLANE represents the memory of someone in prison who can occasionally see the outline of jet planes

Figure 4. Installation View of *THE MOVEMENT*. (Source: authors)

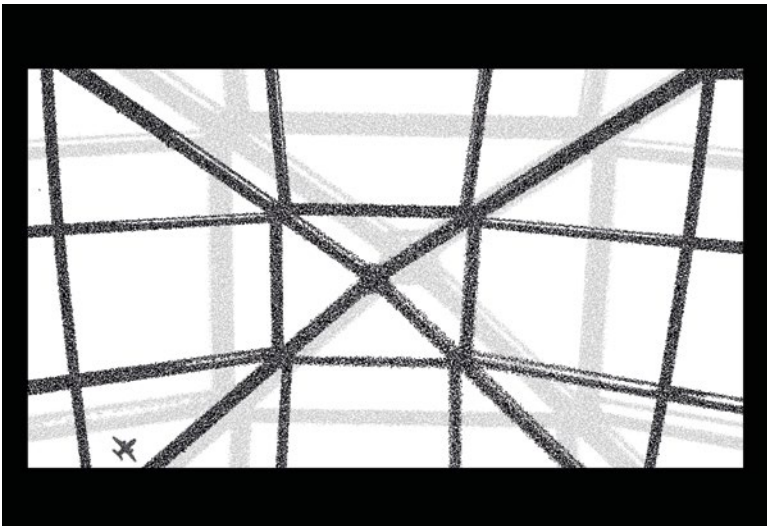

Figure 5. Rice Paper Print of *THE PLANE*. (Source: authors)

crossing over their prison cell. It contrasts a representation of people in free travel by those who have none (see Figure 5).

THE COCKROACH stands for the banality of time by those who are doing time. It is drawn from the journal of someone in a dark prison cell, who finds a cockroach as the only living thing to make conversation with.

The powerful voices and images triggered through the AR intervention become realizations of inspiration and perseverance, as the pixels morph into the recognizable images of those who experienced those injustices and wrote those words and became symbols of resilience and inspiration for the world.

3. future, past tense

We are also interested in using the developing technologies of AR to imagine new avenues of speculative fiction. *future, past tense* uses the interactive abilities of AR to peer into our collective future. In this work, we combine AR with a much older means of creating immersive environmental reality – that of the nature diorama, primarily associated with Museums of Natural History. These dioramas are integrated into a National State Park motif of signage as well, further commenting on the means of staging the natural environment (see Figures 6 and 7). Using the motif of the photo spot popular at public land venues, viewers trigger a series of found-footage vignettes evoking the themes associated with our environmental future. In 1981, more than 14 years ago, Thames Television in the UK broadcast a documentary, *Warming Warning*, that outlined precisely how burning

coal and oil would lead to climate change and threaten our planet. All their predictions have come true. This footage, as well as two key scenes from *The Wizard of Oz*, are remixed in ways both entertaining and haunting.

We welcome visitors to the portals of the future of California by asking the following questions: Will we continue emptying our aquifers of water, leaving behind a parched, depleted desert? Will we continue to heat our planet, flooding our lands with rising seawaters? Will we build a utopic paradise, building harmony with nature?

Figure 6. Diorama View of *future, past tense – flood.world*. (Source: authors)

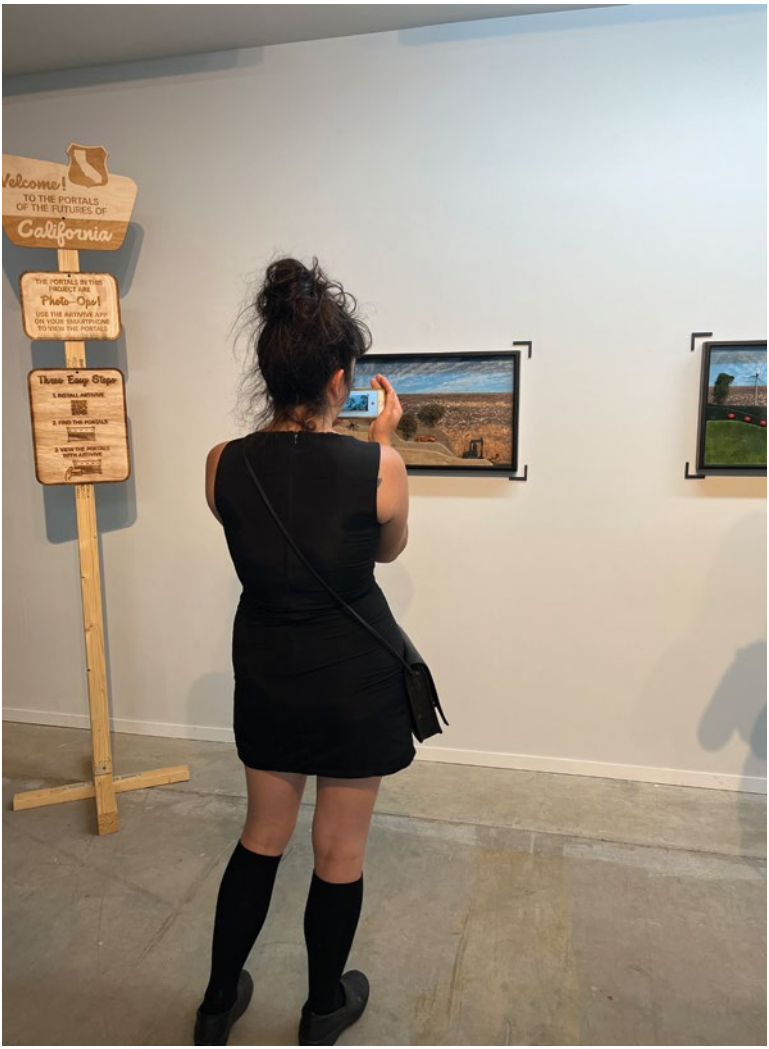

Figure 7. Installation View with Augmented Reality of *future, past tense*. (Source: authors)

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Navigating the Landscape of News Consumption and Avoidance in the Digital Age: The Spanish Case

Laura Pérez-Altable and Javier Díaz-Noci

Abstract. The digital transformation has reshaped news consumption, introducing both accessibility and news avoidance. Focusing on Spain, this study utilized a mixed-methods design, surveying 1,004 participants about consumption patterns, news sources, and avoidance reasons. To enhance understanding, six focus groups with 48 participants were conducted. Survey results were analyzed using both descriptive and inferential statistics. In contrast, the focus group responses underwent qualitative content analysis, including coding, categorization, and theme extraction. By triangulating both datasets, we aspired to present a holistic understanding of news consumption behaviors in Spain's digital age.

Keywords: News consumption · news avoidance · hybrid media system · mixed-methods · consumption behavior

1. Introduction

News avoidance, characterised by individuals intentionally disengaging from news media, has received significant attention. The *Digital News Report 2022* by Oxford University found that the percentage of people worldwide who actively avoided news increased from 29% in 2017 to an average of 38% in 2021. The study, authored by Nic Newman *et al.* (2022), indicates that this behaviour is motivated by a range of factors, including a lack of interest, the negative impact of news on one's mood, and profound distrust of the media.

The intentional or unintentional avoidance of news consumption is influenced by stress, information overload, scepticism towards the media, and political polarisation (Boczkowski *et al.*, 2018; Garret, 2009). Research suggests that younger individuals, women, those with left-leaning political beliefs, and individuals with low confidence in the news are more likely to avoid news content. (Toff & Kalogeropoulos, 2020). The interplay between social class and news avoidance is also important. A recent study (Lindell & Mikkelsen Båge, 2022) indicates that individuals with lower cultural and economic capital have a higher tendency to avoid online news and exhibit different patterns of avoidance depending on the type of news outlet.

Our study examined various aspects of news consumption in hybrid media systems, particularly the phenomenon of news avoidance in Spain. To investigate this, we used a mixed-methods approach, including focus group discussions and a nationwide survey. Our study contributes to the academic literature on news avoidance in hybrid media systems and has implications for media literacy education, journalism, and public opinion.

2. News consumption and news avoidance in the hybrid media system

We are witnessing a shift from post-industrial journalism to a hybrid media system in which traditional and emerging media coexist. Journalists must strategically use conventional and contemporary media platforms to engage their audiences appropriately. Chadwick (2013) argued that this change provides an opportunity for innovative storytelling. Digitalisation is also crucial for journalists to expand their reach, according to Costera Meijer *et al.* (2021). As Anderson, Bell, and Shirky (2014) suggested, media organisations must re-evaluate their business models. This hybrid media system presents challenges and opportunities that require strategic planning and adaptation.

Digital media has given rise to significant changes in how news is consumed, leading to an increasing number of individuals actively avoiding news (Newman *et al.*, 2022). News avoidance involves multiple factors, such as individual preferences and habits, broader consumption patterns, and personal characteristics like age, gender, and socioeconomic status. In a hybrid media environment, algorithms may reinforce avoidance by customising content to users' tastes, leading to incidental exposure to news. As digital channels and social media platforms proliferate, users are more likely to stumble on news content, potentially leading to disengagement from intentional news consumption.

Another aspect to consider in the current hybrid media system is the abundance of information, significantly affecting media consumption patterns, including news avoidance. The surge in digital platforms and devices has led to unparalleled access to vast information, profoundly altering

individuals' engagement with news media. Exposure to excessive news content can trigger psychological stress or news fatigue, leading to intentional news avoidance due to increased dissatisfaction with the news media.

This study seeks to delve into the motivations behind news avoidance to illuminate its underlying causes and impact on overall news consumption, including the part played by incidental exposure in shaping news consumption habits. The research questions posed in this investigation were designed to systematically explore the various dimensions of news avoidance and their potential influence on general news consumption. The following research questions were addressed in this study:

1. What factors are instrumental in encouraging individuals to avoid the news?
2. To what extent does selective news avoidance affect general news consumption trends?
3. In the context of news avoidance, what significance does incidental exposure have?

3. Methods

This study used mixed methods to collect both qualitative and quantitative data. Qualitative data were obtained from focus group discussions, the primary data sources. These discussions helped us understand the various factors affecting individual attitudes and behaviours regarding news consumption and avoidance in the Spanish hybrid media system. The focus group format allowed for deeper understanding and enabled researchers to identify emer-

gent themes. This study used a national survey to collect quantitative data from 1,003 individuals. This method broadens the scope of the research and provides a robust empirical foundation for a comprehensive understanding of news avoidance in contemporary media.

3.1 Focus groups

In October 2021, six focus group discussions were conducted, three each in Madrid and Barcelona, Spain's two most populous and influential cities, respectively. The focus group sessions were carefully designed and executed with GESOP, a specialist company in opinion and market research. Each focus group consisted of seven to eight participants and lasted for approximately two hours. The focus group structure incorporated multiple variables into the participant selection process, including gender, age, education level, and media engagement.

The participant sample was distributed across gender, age, and education levels. All participants were residents of either Madrid or Barcelona and were selected based on their usage of instant messaging applications such as WhatsApp, Telegram, or Signal. This study also aimed to include individuals who use a variety of social media platforms, including Twitter, Facebook, Instagram, and TikTok. Participants active in public spheres, such as cultural, political, and trade unions; political parties; and NGOs, were included.

The sociodemographic variables employed in this study were comprehensive, ensuring the sample was diverse and representative. Table 1 provides a detailed overview of the socio-demographic variables used in this study.

Characteristics	Description
Gender	Women 50%, men 50%
Age	20-29 years (2 FG), 30-49 years (2 FG), 50-65 years (2 FG)
Education	50% with university studies, 50% without university studies
Location	Residents of Barcelona city and metropolitan area (3 FG) and Madrid (3 FG)
Required technology	Have at least one instant messaging program installed (WhatsApp, Telegram, Signal, among others.)
Social media usage	Representation of people who use various social networks (Twitter, Facebook, Instagram, TikTok, among others.)
Political engagement	50% without public engagement: no participation in cultural associations, political parties, trade unions, or NGOs, and 50% with public engagement: cultural associations, political parties, trade unions, or NGOs.
Media engagement	3 FG with people with high media engagement and 3 FG with people with medium and low media engagement (50%).

Table 1. Demographic variables for the focus groups. Source: The authors

3.2 Survey

In the quantitative phase of this research, an internet-based, self-administered survey was conducted via an online panel, employing a stratified sampling technique with uniform allocation. The scope of the study encompassed Spain, targeting individuals aged between 18 and 74 years

residing in the country. The sample consisted of 1,003 interviews.

To ensure representativeness, the collected data were weighed according to the actual distribution of the target population. The margin of error was calculated as ± 3.4%, assuming a 95% confidence level, and p=q=0.5. Data collection took place from 10 March to 16 March 2022, and GESOP, an opinion and market research company, was responsible for the fieldwork, adding methodological rigour to the study.

4. Findings

4.1 News Consumption and avoidance in the hybrid media system

Our analysis of the data on news consumption displays a varied pattern of habits among the respondents. According to the results, 30.8% of respondents opted for radio or television news broadcasts to stay informed about current events. Furthermore, a substantial percentage of respondents (18.3 %) reported that their news consumption was primarily incidental, as they encountered news items on various digital platforms such as Twitter, Facebook, and WhatsApp.

It has been noted that a significant trend exists among respondents who actively seek news on Google about topics that interest them, accounting for 16.5% of responses. Moreover, 13.9% of participants accessed news primarily through free news media websites. However, only a tiny fraction of respondents (4.3 %) consumed information

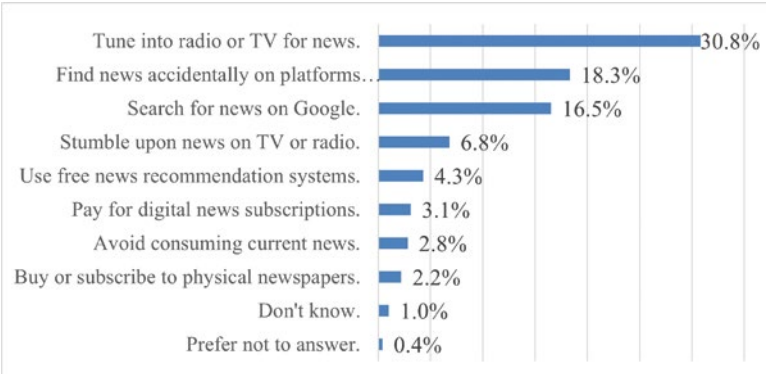

Figure 1. News Access Gateways. Source: Authors based on survey data.

through recommendation systems such as newsletters, media apps, or voice assistants such as Alexa. These data are shown in Figure 1.

Purchase or subscription to physical newspapers is less common, with only 2.2% of respondents indicating this as their primary gateway to the news. News consumption through accidental encounters while watching television or listening to the radio accounted for 6.8% of the responses. A small yet noteworthy portion of the respondents (2.8%) actively tried to avoid consuming current events, demonstrating our sample's degree of news avoidance. Only 0.4% of respondents preferred not to describe their news consumption habits, as Figure 1 shows. These results provide valuable insights into the diverse nature of news consumption habits and the roles of traditional and digital media platforms in current news consumption.

Our examination of the focus group discussions revealed a nuanced shift in news consumption habits. The partic-

ipants indicated a transition from consuming news from multiple sources to focusing on topics of personal relevance. This departure from the broader range of daily news consumption represents a significant change in habits. The reason for this shift warrants further investigation. One possible factor could be the overwhelming abundance of available information, as continuous updates from numerous news sources create a challenging landscape.

Consumers' trust in news may be complicated by the escalating polarisation in news sources, leading individuals to limit their exposure to diverse perspectives. A man with low media engagement noted that the transition involves a move away from active news consumption towards more focused attention, potentially indicating an increasing selectivity in news consumption. This behavioural shift could serve as a coping strategy against information overload and negative emotions linked to excessive news intake, as de Bruin *et al.* (2021) suggested. Specifically, specific news topics may induce distress in some individuals, and the conscious decision to avoid such content could be viewed as a means of managing emotional well-being.

4.2 Exploring the Reasons for News Avoidance

Our study aimed to understand why some people do not engage in current news events. We surveyed respondents on why they actively avoided consuming news, and their answers provided insight into the different reasons for this behaviour. The collected data comprehensively analysed the reasons for deliberate news avoidance. Most respondents (53.2%) said they avoided news due to profound distrust

of the media, which aligns with broader societal concerns. Another 31.9% of respondents cited information overload as a reason for avoiding news, suggesting a challenging information environment that may contribute to news fatigue and avoidance behaviours.

On the other hand, a smaller proportion of respondents (9.6%) stated that unwillingness to pay for news was the primary reason for avoidance. This highlights the economic factors that may influence news consumption and reflects the tension between the accessibility of free information and the financial sustainability of news outlets. Finally, disinterest in current events motivated a minority of respondents (5.3%), suggesting that personal interest plays a role in shaping news engagement. These findings provide a multifaceted understanding of why individuals disengage from their current news consumption. The motivations behind news avoidance are summarised in Table 2.

Based on these findings, the analysis of focus group discussions revealed that trust in traditional media outlets, including newspapers, television, and radio, is a crucial factor in understanding news avoidance. A prevalent negative sentiment towards these sources was observed, characterised by perceptions of bias and a perceived lack of objectivity. This sentiment, suggestive of a perceived ideological slant, has led to diminishing faith in the role of these outlets as democratic actors, subsequently promoting news-avoidance behaviours. Furthermore, a lack of trust may drive individuals towards complete news abstention to circumvent potential exposure to skewed or false information.

One participant, a woman between the ages of 50-65 with a high level of media engagement, expressed, “having observed the same news reported in three different news-

Reasons for avoiding the news	Percentage (%)
Disinterest in current events	5.3%
Distrust in media	53.2%
Reluctance to pay for news	9.6%
Information overload	31.9%

Table 2. Reasons for avoiding news by respondents. Source: Authors based on survey data.

papers, each with distinct angles, it felt as if I were reading entirely conflicting stories. Naturally, this breed confuses trust. Because the news is singular... you end up assimilating various versions, summarising, and ultimately believing what suits you."

Social media platforms, such as Twitter, have become popular sources of news and information. Users can access various news sources based on their interests and trending topics. This shift in news consumption patterns is connected to incidental news exposure, where users come across news content while using social media for non-news purposes. The convenience and immediacy of social media are key factors contributing to the increase in incidental news consumption.

The study used a scale to gauge trust in various media sources, including radio, print media, television, and digital media. The scale was anchored by a "1" indicating a complete absence of trust and a "7" representing high trust. The results showed that 29.3% of participants allocated themselves to the median value on the scale, indicating a moderate level of trust. Conversely, only 12.6% of the respondents conferred the lowest ratings, signifying minimal to no trust. These

findings are consistent with the sentiments of media distrust expressed in the focus group discussions.

Notably, only 8.1% of the respondents expressed high levels of trust by selecting the highest rating on the scale. This suggests that increased confidence in media outlets was relatively rare among the respondents in this study. As a result, pervasive scepticism and scarcity of trust in media sources are significant factors in understanding the prevalence of news avoidance.

Interpreting the data based on age groups provides insights into subtle trust level patterns towards media outlets within these demographics. For the 18-29 year age bracket, moderate trust in media was the most frequent rating selected by 28.3% of respondents. However, 14.9% of this group had a lower value, indicating substantial distrust among younger participants. In the 30-44 age group, the two most common ratings were five (25.8%) and six (19.4%) on the Likert scale. This suggests that this group had a slightly more favourable attitude towards media outlets than the younger group. For the 45-59 age group, the most significant proportion of respondents (32.8%) gave a rating of five, while 20.0% placed their trust at a higher level of six. In the oldest age group (60-74), a rating of 5 prevails (29.7%). However, this group also had the highest percentage (9.4%) of respondents who reported having no trust in the media (rating 1).

5. Conclusions

As examined in this study, news avoidance is a multifaceted and complex issue influenced by various factors, including news consumption habits and trust in media. The analysis

of different age demographics revealed that these factors significantly impact engagement with news, resulting in distinct patterns of news avoidance behaviour.

The most significant factor contributing to news avoidance was widespread distrust in traditional and digital media outlets, particularly among older individuals who reported minimal trust. This lack of confidence challenges media organisations to rebuild their credibility and perceived impartiality, which could mitigate news avoidance tendencies and foster increased news consumption.

Age-specific analyses highlight the need for a tailored approach to address news avoidance. The variations in trust levels across different age cohorts demand a nuanced understanding and practice that considers each demographic's unique perceptions and concerns.

In addition to trust, news consumption habits also play a crucial role in the landscape of news avoidance. The emerging pattern of selective news consumption, characterised by a shift from actively seeking news to more incidental exposure through social media platforms, has significant implications for the presentation and dissemination of news. Emphasis on the relevance and quality of news content is paramount in this new era of news consumption.

The role of social media in shaping news consumption behaviour is another critical aspect to consider. The convenience and perceived plurality of social media platforms makes them attractive news sources. However, these platforms also pose challenges related to the spread of misinformation and the formation of echo chambers, adding another layer of complexity to the issue of news avoidance.

In conclusion, our study sheds light on the intricacies of news avoidance and the factors contributing to it. Given

the prevailing distrust in the media and evolving news consumption, a multifaceted approach is necessary to address this issue. Future research should explore potential interventions and strategies to mitigate news avoidance, enhance media credibility, and foster a more informed and engaged society. These findings and insights are crucial in shaping the discourse on news consumption and release and highlight the urgency of fostering a trustworthy, reliable, and responsive media landscape that meets the diverse needs of its audience.

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Platforming the Epic: An Intermedial Approach to Virtual Reality and the Immersive Simulation of the *Mahābhārata*

Shivani Sharma and Jon Bath

Abstract. The critical landscape of the intermedial transmissions and modes of operation of the epic narrative has shaped the *Mahābhārata* into a living tradition. This study showcases the possibility of visualizing tales from the *Mahābhārata* in virtual reality. This paper makes three interlinked arguments: First, the transmedial representations of the epic have democratised the narrative space; second, the distinctive modalities of the virtual reality medium attend the semiotic process of the epic in its narrative structure; finally, the dissemination of the *Mahābhārata* through intermediality facilitates a semiotic framework for (re)imagining the epic. Creating the virtual reality episode opens the possibilities of constructing a digital narrative tradition.

Keywords: Virtual Reality · Immersive Simulation · Semiosis · Intermediality · Epic · *Mahābhārata*

The critical landscape of the intermedial transmissions and modes of operation of the epic narrative has shaped the *Mahābhārata* into a living tradition. The present study focuses on the use of virtual reality to revisualize an episode from the *Mahābhārata* to investigate the medium's narrative potential for remediating the epic. The research emphasizes the extension of the intermedial transmission of the epic's narrative and demonstrates the process of visualizing the tales from the epic in the realm of virtual reality through the first-hand experience of creating a retelling based on the 18 days of war between the two cousins, Kauravas and Pandava[1]. The study showcases the demise of Abhimanyu on the battlefield in the episode of the labyrinth with the tools such as *Blender*, Unity, and Oculus Quest. It also examines the correlation between the emergence of new media and the digital revival of stories from the *Mahābhārata* via a virtual reality narration.

Between Virtual Reality and Intermediality

This study follows the approach of intermediality to analyze the complexities of the narrative dissemination and depth

1. The *Mahābhārata* is a tale about a family feud – the Kauravas and the Pandavas, who belong to the Bharata race. There are multiple layers of narration and intertwined stories which form a grand structure of the epic.

of articulation of the events from the epic while creating alternate readings of the narrative. The engagement with the virtualization emphasizes how the medium engages with the tales through its unique technique of immersive narration. This research extends the approach of intermediality through the development of a virtual reality framework of the *Mahābhārata*.[2] This paper is divided into the following segments: (a) understanding the intermedial approach in virtual reality, (b) (un)making the virtual retelling of the epic, (c) creating the futurscape, (d) interweaving the scenes and simulating virtual characters, and (e) adding the cinematic transitions. This research deals with the following research questions: How does the creation of the episode suggest the possibility of converting the epic into a virtual reality narration? How does the shift from the textual to the virtual mode affect the semiosis of the epic? And how does the virtual reality episode contribute to the digital narrative traditions of the epic through the approach of intermediality?

New forms of storytelling beyond the local contexts indicate how digital communication is transforming the imagination of the viewers and their engagement with the *Mahābhārata*.[3] In the early 1990s, the word "virtual

2. It recreates the episode of the labyrinth from the 18 days of the war, and the virtual immersion is achieved using *Blender*, *Unity*, and *Oculus Quest 2*.

3. The representation of the narrative beyond the local contexts refers to the epic tales presented in the graphic novel such as the *Kaurava Empire* (2014). The graphic narrative situates the epic in a futurist space which showcases the city-scape of Hastinapur and the battlefield of Kurukshetra, the characters from the epic in cybersuits,

reality" was coined along with other terms like "virtual environment (VE)" and "synthetic environments (SE)" (Vince, 1998, p. 4). Virtual reality is defined as creating "images of 3D scenes with which one can navigate and interact. By navigating, we imply the ability to move around and explore features of a 3D scene such as a building; whilst interact implies the ability to select and move objects in a scene, such as a chair" (Vince, 1998, p. 4). It has expanded the domain from building three-dimensional images to "creating "acceptable" reproductions of real objects or environments for training, entertainment or design purposes" (Gutierrez, Vexo, and Thalmann, 2008, p. 1). It's important to note that, despite its origin in the late twentieth century, virtual reality is still regarded as a new media platform that requires technological growth and improvement. Virtual reality provides a unique environment for (re)creating stories and experiencing them in an immersive domain. Similarly, the virtual reality experience of providing the user with a deep-learning perspective.

The intermedial approach is instrumental in developing an understanding of the epic traditions of the *Mahābhārata* established through the cross-media adaptations. The notion of intermediality refers to the intersections of media's diverse representational practices. The *Fluxus* artist Dick Higgins creates the term intermediality to explain the network of shared patterns of presentations as "uncharted land that lies between collage, music, and the theatre" (Moren, 2003, p. 42; Rippl, 2015, p. 10). Intermediality is interpreted

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the spacecrafts, and the use of artificial intelligence and advanced technology in warfare.

as an echo of Bakhtin's dialogism and Kristeva's theory of intertextuality. The term, like the theoretical concepts of dialogism and intertextuality, refers to the semiotic network of interconnected references that defines the mediation of a text. David Boller and Richard Grusin develops the term remediation to explain the interrelations of media representations and argue that "all mediation is remediations," projecting remediation as a form of intermedial connections. W.J.T. Mitchell also highlights the palimpsestic nature of a medium when he asserts that "all media are mixed media" (Mitchell, 2005, p. 260).[4] Thus, intermediality "refers to the relationships between media and is hence used to describe a huge range of cultural phenomena which involve more than one medium" (Rippl, 2015, p. 23). The theoretical framework of intermediality explains how "meaning is generated in/by inter-, multi- and transmedial constellations

4. Werner Wolf, one of the pioneers in developing intermediality, discusses the "intermedial turn", which invited several interventions in analyzing the relationship between mediums. Wolf extends the similarity of viewing intermediality with another term, intertextuality (Wolf 35). Irina O. Rajewsky further reframes the notion of intermediality in the article *Intermediality, Intertextuality and Remediation: A Literary Perspective on Intermediality* and explains intermediality at three levels: (a) medial transposition, (b) media combination, and (c) intermedial references (Rajewsky 51 and 52). The *medial transposition* focuses on adapting and retelling a narrative from one medium to another (Rajewsky 51). The *media combination* foregrounds the blending of two or more mediums to form the production of a single medium. For example, film as a medium requires several other medial tools to operate, such as a camera, computerized techniques, and sound. The final category, the *intermedial references* involves substituting of one medium within another, which helps in reproducing the intertextual material of a narrative. For example, the use of photography in producing cinematic shots for a film.

and cross–media references" (Rippl, 2015, p. 18). In this research, the notion of intermediality suggests the way the intermedial connections contribute to the construction of digital narrative traditions of the epic.

In retellings of the epic, the genre of science fiction and futurist landscapes have been extensively explored, particularly in the form of graphic novels such as Grant Morrison's *18 Days* (2010) and Jason Quinn's trilogy, the *Kaurava Empire* (2014).[5] Morrison and Quinn's portrayal of (re)visualising the tales in the futurist landscapes serves as a framework for this intermedial research of demonstrating a virtual reality episode from the epic. The intermedial connections between the mediums such as book-text, comics, and television to graphic novels have played a significant role in propagating the epic narratives in visual-verbal forms.[6] The stories from the *Mahābhārata* travelled in popular literature through adaptations across the mediums, and the approach of intermediality can help us comprehend the process of decoding the cultural semiosis of the tales. Intermediality provides the theoretical understanding for developing the

5. Grant Morrison's *18 Days* (2010) is considered as the first graphic novel representing the tales from the *Mahābhārata* in the medium of graphic narrative. Jason Quinn and the illustrator Sachin Nagar's *The Kaurava Empire: Abhimanyu and the Conquest of Chakravyuha* (2014) is referred in this manuscript.

6. The indermedial connections between the epic narratives represented in the book text form of K.M. Ganguli's the *Mahābhārata* (1883), B.R. Chopra's series televised in 1988, and Quinn's and Morrison's graphic novels showcase the transmedial shift of the epic narrative in different mediums.

virtual reality episode inspired by the graphic novels.[7] In its comprehensive critical framework, the approach enables us to record the manifestations of the epic traditions in the medium of virtual reality. It also equips us with the critical tools for unravelling the function of each component of virtual reality and extends the visual-verbal articulation of the *Mahābhārata*.

(Un)Making of the VR *Mahābhārata*

The approach of intermediality enables us to register the intersections between the epic traditions, digital modalities of virtual reality and the narrative template of science fiction in recreating the episodes. The research demonstrates how the medium of virtual reality creates an immersive mode of narration. This section discusses the applicability of the intermedial approach in assessing the virtualization of the select episodes. The study also includes a critical analysis of the functionality of these digital tools in recreating a virtual reality paradigm, especially the experimental component of the episode's development. While the visual-verbal intermedial references from graphic narratives such as Grant Morrison's *18 Days* (2010) and Jason Quinn's *Kaurava Empire* (2014) provide crucial cues for (re)imagining the epic, science fiction's generic structural properties also serve to translate the characters from the epic in the interactive space of virtual reality narration.

7. The graphic novels situated in the futuristscapes refers to Morrison's and Quinn's creative retellings.

This study revisualizes the episode of the labyrinth, devised by Dronacharya, which resulted in the demise of Abhimanyu. The events leading up to Abhimanyu's death are retold through the narratorial voices of two characters: Uttara, Abhimanyu's wife, and Durmashana, Duhsasna's son. The virtual reality episode is divided into two parts: (a) events leading up to the war between the two clans and (b) the labyrinth episode. Durmashana, one of the virtual reality story's main character, is on a quest to recover his status as a warrior in Kaurava's clan. Uttara, the storyteller, is the protagonist of the story. Durmashana and Uttara are peripheral characters in *Mahābhārata*'s narrative structure and grand scheme. To expand the epic's semantic reach, the virtual reality episode draws out these peripheral characters and figures them more centrally in our retelling.[8]

Act one is divided into four scenes, each narrating the tale of the labyrinth's episode during the war's 18 days. The first scene of act one is *Uttara, The Threadbearer*, in which the virtual reality episode's storyteller describes the events from her point of view while also introducing the tale's other two important characters, Durmashana and Abhimanyu. The *Mahābhārata*'s virtual reality episode sheds light on Abhimanyu's death on the thirteenth day of the war. Durmashana, son of Duhsasna, recounts the story from the perspective of the Kauravas, criticizing

8. Amruta Patil in the graphic novels *Adi Parva* (2012) and *Sauptik* (2016) foregrounds the peripheral characters from the epic Ganga and Ashwatthama in her creative graphic retellings. For more discussion on peripheral characters, refer to the article *In the Semiosis of Characters and Colors: Locating Metaphors and Their Meanings in Amruta Patil's Graphic Novels Adi Parva and Sauptik* (2021).

the Pandavas for initiating and continuing the war. Quinn, in the *Kaurava Empire* (2014), discusses that "Abhimanyu already has a fearsome reputation as a mighty warrior, and Durmashana is anxious to build a reputation of his own by slaying the Pandava Prince" (Quinn, 2014, p. 7). The conflict between Abhimanyu and the Kauravas is depicted in the epic through the deployment of weapons such as maces (Ganguli, 1983, p. 614). The futuristic space, on the other hand, utilizes solar beams to introduce futurist weapons while visualizing the confrontation between the two armies. The virtual reality story re-visualizes the traditional story of the epic and situates the characters in the neo-mythical space of science fiction.

As the virtual reality episode's creators, we have taken the artistic liberty by situating Uttara as the narrative's storyteller, foregrounding the peripheral character from this epic saga. In the first scene of the episode, Uttara provides a glimpse of the battlefield and begins the story with Durmashana's monologue. Durmashana addresses the impending battle and defends his family's viewpoint. He clarifies that the Pandavas' actions and attempt to recover the territory caused the conflict. He further adds that the Pandavas are spreading lies about his father, Duhsasna, and falsely accusing him of humiliating their queen, Draupadi. Durmashana takes up a position on his family's side of the conflict and intends to fight. Uttara narrates in the retelling that Bhishma, the commander in chief of Kaurava's army, is unwilling to fight against the Pandavas. The second scene, *Hatching the Conspiracy*, transfers the action from the fight to the assembly hall in the spacecraft's panoramic vision, where Duryodhana and Duhsasna participate in a conversation with Durmashana. Before the

thirteenth day of the war, the story gives a close-up look at the father, Duhsasna, and Durmashana's relationship. When the narrative moves from Durmashana to Abhimanyu in the first act, a perspective on Arjuna's concern for his son's life is suggested. In the retelling, especially in the final scene of the first act, Uttara, the character, is seen conversing with Abhimanyu about the war's repercussions. The second act opens with Bhishma's defeat by Shikhandi and the deafening silence at the spacecraft of the Kauravas. Drona becomes the next commander-in-chief and decides to construct the labyrinth. The narrative point of Abhimanyu's arrival inside the labyrinth concludes the act. Act two depicts Abhimanyu's journey through the labyrinth, the combat between Durmashana and Abhimanyu, and his demise. In a later section, we will discuss each scene and its process of creation in detail.

The representation of the narrative of the labyrinth shifts the visualization into a virtual model. The episode is crucial in integrating the intermedial aspects of their characters, narratives, and the depiction of the war into a three-dimensional sphere. The portrayal of the protagonists, the futurist image of Hastinapur, and the battleground were aided by references from Quinn's and Morrison's graphic novels. Our first attempt to create the virtual reality episode includes using the tools such as Tilt Brush and *Gravity Sketch* to create the models, technologies are beneficial to building three-dimensional environments by offering the artistic canvas for developing characters and scenery. However, neither tool's organic aesthetic style was suitable for designing the futuristic environment we had envisioned.

The software *Blender* helped in creating the three-dimensional characters with the support of its in-built assets.

It is an open-source tool that uses *Python* programming to construct three-dimensional models of the characters in the episode. It "allows the user to create high-quality animations of 3-D models and data. In the video game and entertainment industries, it is widely used" (Taylor & Parish, 2012, p. 7). Uttara, Durmashana, Abhimanyu, Bhishma, Duryodhana, Duhsasna, Arjuna, Yudhishthira, Bheema, and Drona's three-dimensional modelling is supported by aspects of sculpting, rigging, and simulation in the way to design models. Meshing, lighting, animation, camera control, scripting, and rendering are used to develop these 3-D models (Taylor & Parish, 2012, p. 9). The characters created on *Blender* were rendered into *Unity* to merge with the landscapes. A significant portion of the research entailed learning *Blender*, *Unity*, and *Oculus Quest 2* before commencing the pre-production process.

Unity is an animation software that can render two-dimensional and three-dimensional models and environments. *Unity* was used in the creation of three-dimensional scenes, which improved the animation's interactivity. Sue Blackman discusses the advantages of using *Unity* that "is a perfect choice for small studios, indie developers, and those of us who always wanted to make our own games. Its larger user base (over 400,000 as of April 2011) and extremely active user community allows everyone from newbies to seasoned veterans to get answers and share information quickly" (Blackman, 2011, p. xix). Unity's user base has grown to 2.7 billion by 2021. Unity allows the user to define the texture, scene compression, and rendering within the three-dimensional modelling. *Unity* engine's user interface offers an immersive experience when importing three-dimensional models. In the realm

of virtual reality, it helps in generating the episode of the labyrinth. Furthermore, the dialogues of the three-dimensional characters in the *Mahābhārata* episode were employed through software such as *Replica* and *Play.ht* to augment artificial intelligence voiceover actors. These applications have the capabilities that allow users to customize their tone, pronunciation, and speech patterns. However, the AI voiceover is not limited to "making a convincing synthetic voice takes more than just pressing a button. Part of what makes a human voice so human is its inconsistency, expressiveness, and ability to deliver the same lines in completely different styles, depending on the context" (Hao, 2021, p. 4). The AI voiceover offers the opportunity to alter the speech intonations of their virtual characters. It plays a significant role in navigating the meanings of utterance through accent variation and subtle modulation of voice. Since AI voice over in South Asian accent is available in limited options, the project also uses human voice actors to embody South Asian voice modulation and its distinctive accent, which determine the semantic reach of the dialogues and their context of utterance. As a result, combining AI voiceover with human performers is a viable option for this study.

We used *Facebook*'s *Oculus Quest 2* to experience the episode. The headset is a standalone device that functions in conjunction with the user's track motion. *Quest 2* is initiated with "touch controllers, tweaking visual clarity by changing the distance between the lenses, and setting up a guardian boundary for unobstructed play" (McMullen, 2021). The hand-controllers and headset create a seamless three-dimensional image, immersing the user in virtual reality. Importing *Unity* files with three-dimensional views,

controlling the headset, and studying how to use fast-forward, skip, and pause in scene functions are significant aspects of learning *Quest 2*. The concluding process also incorporates rendering and recording of the virtual reality episode to produce the final version.[9] A limitation of using *Quest 2* is that it is not an open-source platform, which prevented us from releasing the episode in the *Quest* application store. As a result, we released the episode on *YouTube 360 Videos*, which could be accessed via *Quest 2* and other VR devices.

Virtual Epic and the Futurscapes

This section explains how the virtual reality episode's three-dimensional landscape and characters were developed for the research. The section contends that the immersive environment determines the process of translating a futuristic *Mahābhārata* into virtual reality. *Unity* was an essential platform for creating the futuristic battleground landscape. The episode deploys landscapes to display the events leading up to the encounter between Durmashana and Abhimanyu. The landscapes were constructed in *Unity*'s skybox, which enables the platform to construct a complex layout of the battleground. The three skybox planes are as follows: (a) the inside view of Kaurava's aircraft as the assembly hall, (b) the battleground, depicting the two armies of the Kauravas and the Pandavas before

9. The rendering and processing of the episode was executed in *Adobe Premiere Pro*.

the commencement of the war, and (c) a battlefield showcasing Drona's complex formation of the labyrinth devised to defeat the Pandavas. The theme of tension between the two clans engages the virtual reality domain of the epic.

The futuristic aircraft serves as an assembly point for the Kauravas in the episodes. The assets are arranged inside the spaceship, primarily to highlight the central equipment. The episode of the spaceship is shown during the second scene of act one, when Durmashana meets his uncle Duryodhana, father Duhsasna, and grandsire Bhishma (see Figure 8). The meeting on the aircraft is described as one of the virtual reality episode's pivotal moments. The utilisation of modular assets showcases the narrative in a compressed format with high-resolution images. By importing meshes in the episode, the optimisation of the scenes and characters include a level of detailing, also known as *lod*, that helps to downscale the processing time of the assets while improving the quality of virtual reality's domain.

The virtual reality episode's opening scene, which also represents the battlefield, features a two-dimensional vision intended to convey the epic war's grandeur (see Figure 1).The detailed and careful selection of futuristic cars, aircraft, tanks, troops in armour, and animals is meticulously planned to demonstrate the strength of both armies. In the second scene of act one, Duryodhana says that "we have the largest army", demonstrating their numerical superiority over the Pandavas. We have carefully designed both the sides of the cousins' troops for the viewers to identify the Kauravas' side as having a larger force. The armies were created with the help of modular assets. These assets were designed, developed

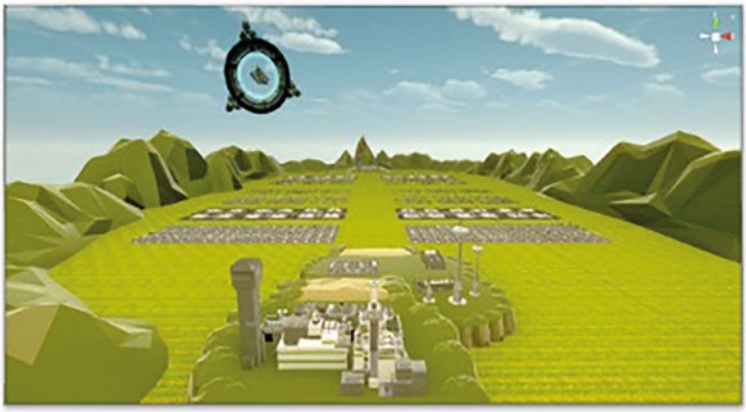

Figure 1. The two-dimensional perspective of the battleground

and arranged with the modular aspect assisting in reducing the processing size of the characters.

The second battleground highlights the labyrinth designed in a layered formation by Drona to capture the Pandavas (see Figure 2). The troops are organised in circular patterns in a multi-layered arrangement. The scene illustrates the entry of Abhimanyu into the labyrinth. The labyrinth's landscape differs from the prior battleground, particularly in the colour scheme used to convey the battlefield's intensity. The use of low-frequency hues in the sky's red and orange shades has helped to bring a strong atmosphere to the foreground, including futuristic cars, aircraft, animals, and troops in a circular formation.

Using light probes to improve the optimization of the reflection in the virtual reality episode is an essential component of constructing the battlefield scenes (see Figure 3). The lighting of the scene is a crucial aspect of the virtual reality experience and also regulate the three-dimensional

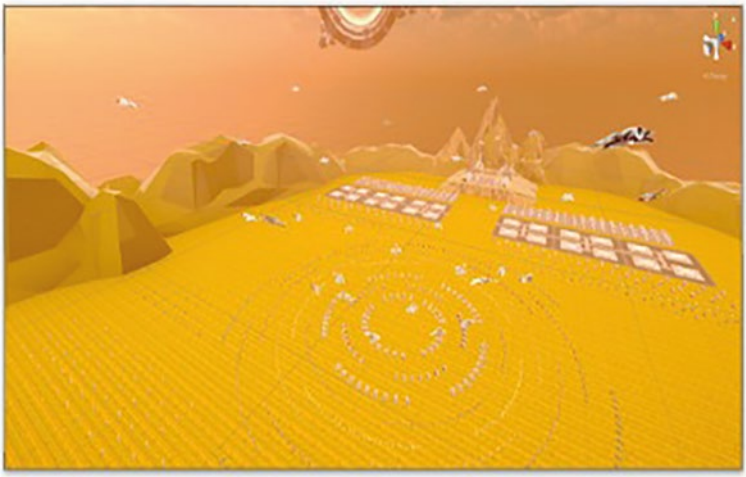

Figure 2. The Depiction of Labyrinth in Two-Dimension

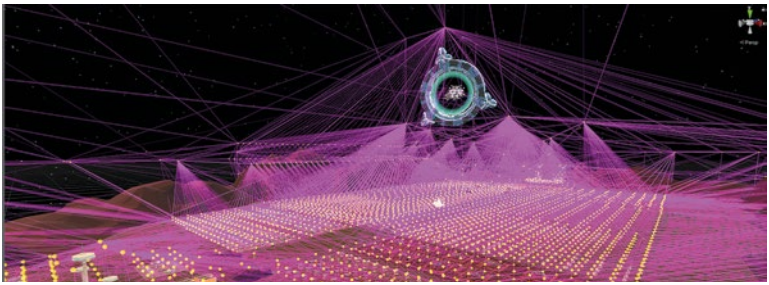

Figure 3. Light Probes in the battlefield

graphics. The use of the light probes is twofold: "(a) to provide high-quality lighting (including indirect bounced light) on moving objects in your scene, and (b) to provide the lighting information for static scenery using *Unity*'s

level of detailing system" (Unity Manual, 2020). The probes emit the baked light to the scenes and interpolate through the empty spaces in the episode. The probes aid in improving the quality of baked light's influence on moving and stationary objects. The scenes of the battlefield and the optimization through the rendering of the mesh are activated through the light probes. In *Unity*, there was a limitation to manually bake the light, which resulted in optimization irregularities, and processing the battlefield scenes with baking did not produce the optimal frame per second. As a result, the real-time recording of the scenes offered the optimal lighting output in the battleground visualization.

Developing characters for the virtual reality episode is the following step in the pre-production process. The three-dimensional models created in *Blender* were processed in *Unity* to merge with the landscapes of the episode. Uttara, Abhimanyu, Durmashana, Bhishma, Drona, Duryodhana, Arjuna, Dushashana, Bhima, and Yudhishthira were among the characters with three-dimensional representations. These characters have expanded the narrative dimension of the episode. The characters' prototypes are created using low poly graphics, and the models feature motion and shading techniques for animated appearance. The advantage of using low-poly graphics is that it is less resource intensive than high-resolution graphics. It made the rendering of the characters in the scenes more eficient to record the episode in *Unity*. The figure depicts the character of Uttara, the storyteller of the virtual reality episode (see Figure 4). Using low-poly also facilitates the creative liberty for producing the pictorial abstractions in the characters.

Figure 4. The character of Uttara in T posture

Figure 5. Durmashana and Abhimanyu in T posture

Scott McCloud examines the use of abstraction to illustrate the characters' facial models. McCloud argues that "when we abstract an image through cartooning, we are not so much eliminating details as we are focusing on specific details. By stripping down an image to its "essential" meaning, an artist can amplify in a way that realistic art can't" (McCloud, 1993, p. 30). Drawing on McCloud's contention that facial abstractions function as a sign, the virtual reality episode builds three-dimensional reconstructions of the characters with minimal features on the facial structures.

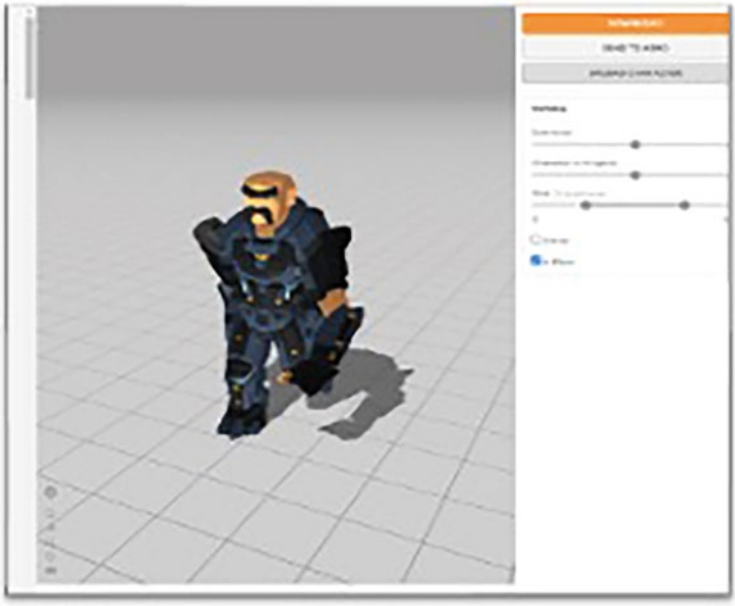

Figure 6. Animation of Bhima in *Mixamo*

The facial abstraction provides depth to the characters by allowing scope for user interpretations. The attempt is to draw the attention of the user to other forms of the characters, such as cybersuits, voiceovers, and animation. The image depicts the two central characters of the labyrinth's episode – Durmashana and Abhimanyu (see Figure 5). The characters are developed using the distinctive colors of their cybersuits. Each model was rigged and sculpted with the available assets in Unity, and the attempt was to provide an individualistic quality to each character. The Pandavas are displayed in cobalt color suits and the Kauravas are shown in crimson color. The appearance of the young characters such as Durmashana and Abhimanyu can be visualised

through the difference in structural appearance between the models (see Figure 5).

The concluding two steps for the pre-production process incorporating animation into the character models. The illustration shows how the application *Mixamo* was used to include animation in *Bhima*'s character (see Figure 6). It aided in the rigging of the characters and the integration of the animation for use in *Unity*. The animation indicates the characters' motion and exhibits the intensity of the combat between Durmashana and Abhimanyu. Finally, the rendering of the voiceovers has played a significant part in animating the characters. The virtual reality episode has also utilized artificial intelligence (AI) voiceovers and natural (human) voice actors. The artificial intelligence voiceovers available in *Replica*, voiceover and *Play.ht* have provided the South-Asian voices for the episode, especially for the characters such as Duhsasna, Durmashana, Arjuna, Abhimanyu, Bhima. The AI voices were chosen for their compatibility with the characters' intonation and tone. Due to a lack of adequate AI voiceovers for South Asian voices, I added the dialogue narration of the voice actors for characters like Uttara, Bhishma, Drona, and Yudhishthira in the episode. As a result, the following portion will focus on the episode's production and fusing the animated characters, environments, and voiceovers in *Unity*.

Simulating Virtual Characters of the *VR Epic*

The procedure of producing the virtual reality episode during the production stage composites the three-dimensio-

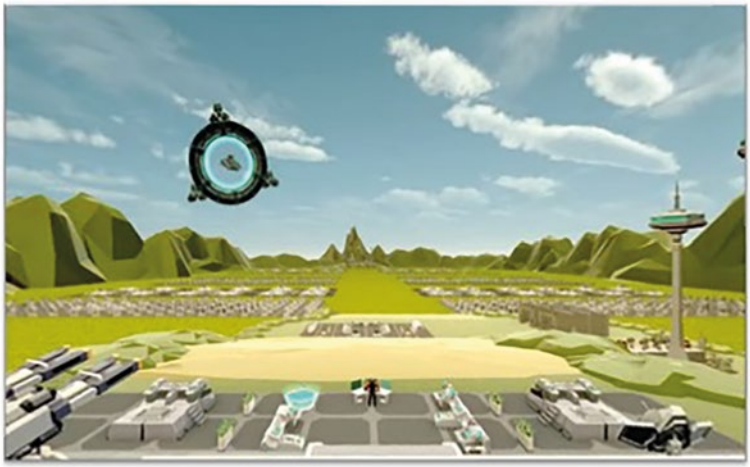

Figure 7. The scene one titled *Uttara, the Threadbearer*

nal characters, the landscapes, and the voiceovers in *Unity*. The episode is divided into two acts, with four scenes in act one and two sequences in act two. This section discusses the process of creating the episode in two-dimensional and three-dimensional forms. The voiceovers play an instrumental role in animation and elaborate the visual experience for a user in a three-dimensional space. The narrator, Uttara, recounts from the perspectives of both Abhimanyu and Durmashana, the primary characters. Uttara's narration supports the immersive three-dimensional experience of the viewer by channelising the narrative through scenes in the episodes.

The three-dimensional experience of the episode goes through the process of creating the scenes in a two-dimensional space. Landscapes, voice-over narrations, three-dimensional models of the characters, and background music are important components of the virtual reality episode.

As mentioned earlier, the episodes are divided into two acts, and the first scene of act one, *Uttara, the Threadbearer*, begins with the narration of Uttara, the storyteller, followed by the monologue of Durmashana (see Figure 7). The unresolved conflict of Durmashana for proving himself as a viable member of the Kauravas' army is represented as the central quest of the narrative. Uttara brings her narratorial point of view and unfolds the episode in the middle of the battleground. She points us to Durmashana, who delivers his monologue on the battlefield from the side of the Kauravas. "My family, the mother of all dysfunctional families; what has it not seen!" Durmashana begins the story. "It all boils down to greed and deception. They lost the game first, and now they want to regain their territory like cowards! They are simply spreading lies, and they are liars, terrible liars at that! My father, Dushasasna, is said to have humiliated their queen, and my grandpa, Sakuni, is said to have deceived to obtain the kingdom. I'll hold them accountable for their lies" (Act One, Scene One).

Durmashana refers to the Pandavas as *they* in his opening monologue, as the Pandavas seek to regain their land from the Kauravas following 13 years of exile in the forest. Durmashana portrays the protagonist on the Kauravas' side, whereas Abhimanyu represents the Pandavas' side. The first scene concludes with Uttara's narration, which introduces the Kauravas' first commander-in-chief, Bhishma, and his apparent affinity for the Pandavas. The two-dimensional episode provides creative liberty to us to maintain the camera movement. It assists the viewers in maintaining their engagement with the characters. The narrator, Uttara, takes the spectator on a journey to the episode of the labyrinth, and the three-dimensional form

Figure 8. Scene Two, Act One, *Hatching the Conspiracy*

of the act gives the viewer(s) an immersive experience by anchoring their position to the camera's selected locations but allowing them to take the 360-degree view at their discretion. The camera is positioned in three different places to provide a three-dimensional view of the episode: (a) Uttara's narration giving the view of the battlefield, (b) during Durmashana's monologue, (c) and the introduction of Bhishma.

The second scene of act one of the episode *Hatching the Conspiracy* begins the narrative in the Kaurava's quarters in their spacecraft (see Figure 8). It initiates a debate among Durmashana, Duhsasna, and Duryodhana. Durmashana enters the chamber of the spacecraft with the news that Bhishma, their grandsire, has not "been fighting with his utmost strength! Unfortunately, he still considers Pandavas, the enemies, as part of their family" (Act One, Scene Two). Duryodhana interjects, assuring Durmashana and

Figure 9. The scene three of the first act titled *Abhimanyu's Odyssey*

Duhsasna that they will win since they have the strongest military. Duhsasna, on the other hand, reminds Durmashana of Bhima's oath and asks him not to join the Pandavas on the battlefield. In the episode, Duhsasna makes several attempts to counsel his son about the Pandavas. Bhishma joins the conversation and warns them about the Pandavas' might. Durmashana discusses his plans to attack the Pandavas, particularly Abhimanyu, at the end of Act two. In both two-dimensional and three-dimensional renderings, the camera's position is identical. The three-dimensional episode, on the other hand, gives the audience a 360-degree perspective of the spacecraft's chambers and an immersive experience.

The Pandavas' perspective is visualised in the final two scenes of the first act, particularly Abhimanyu's view of the battlefield. Uttara navigates the scene of the Pandavas' quarters on the battleground (see Figure 9). The third scene

Figure 10. The fourth scene of act one titled *Longing for Abode*

three opens with a conversation between Arjuna, Abhimanyu, Yudhishthira, and Bheema in the middle of the battlefield. Yudhishthira contemplates the war's outcome and says, "so many soldiers and our dear friends have lost their lives already! For whom am I fighting this battle for and at what cost?" (Act One, Scene Three). Abhimanyu, the protagonist of the virtual tale, is introduced through a dialogue with his father, Arjuna. Before returning to the battleground, Abhimanyu prepares for the following day and goes to meet Uttara. The two-dimensional positionality of the camera remains stationary, pointing toward the Pandavas. Similarly, the three-dimensional camera remains in a similar stationary position and provides the viewer with a 360-degree view.

The concluding scene of the first act, *Longing for Abode*, begins with a conversation between Uttara and Abhimanyu (see Figure 10). The Pandavas' quarters on the battlefield

Figure 11. Scene one of the act two *Durmashana's Quagmire*

are depicted in this scenario. The episode emphasises Abhimanyu's role in the conflict prior to the episode of the labyrinth, and Uttara makes an unsuccessful final attempt to stop him. Uttara describes how Kunti, Draupadi, and she were the voices of the oppressed (Act One, Scene Four). During Abhimanyu's discussion with Uttara, the two--dimensional perspective shifts with the character. On the other side, the three-dimensional virtual experience positions the camera near Uttara, where the viewer can see Abhimanyu approaching her and the dialogue between the two. The discussion comes to a close with Abhimanyu departing for the battleground, signalling the commencement of the episode's second act.

The tenth day of the fight has concluded, and Shikhandi has defeated Bhishma in scene one of the second act. Duryodhana and Duhsasna are standing together, and Durmashana expresses his contempt for the Pandavas

(see Figure 11). Duryodhana asserts that "I cannot let the Pandavas take everything away from me! Why can't my son Laxmana and yours Durmashana fight with the same bravery as Abhimanyu?" (Act Two, Scene One) When Duryodhana learns of Bhishma's loss, he is visibly shaken and asks Drona to head the army the next day. During the conversation, Durmashana confronts Duhsasna about finding his position in the clan. In the meanwhile, Duhsasna reminds Durmashana to protect himself during the battle. As the virtual reality episode's antagonist-protagonist, Durmashana advances to the battleground. The two-dimensional and three-dimensional visualisations are positioned in cinematic locations that are identical.

Drona announces the thirteenth day of the conflict and discusses the construction of the labyrinth in the episode's concluding scene. He says that "I am going to create a labyrinth, a battle formational that is unbreakable by anyone, except Arjuna! We must keep Arjuna away from the battleground. Our drones, cars and aircraft will be spinning in the outer circle of the labyrinth, making each layer tougher than the other. We will be controlling the labyrinth from the centre and kill those who dare to enter it" (Act Two, Scene Two). A multi-layered defensive configuration between soldiers and weaponry is the labyrinth, a circular maze. The final act visualises Abhimanyu entering the labyrinth, and his aircraft crashes inside the disc. The story also includes perspectives from the Pandavas' point of view while witnessing the occurrence. It depicts Uttara and Bhima pleading with Abhimanyu to return. The conflict between Abhimanyu and Durmashana in the labyrinth is depicted in the virtual landscape (see Figure 12). The final attack on Abhimanyu is portrayed to be carried out

Figure 12. Scene Two of the act one *Arjuna's Retributions*

by Durmashana. Arjuna returns to the camp and learns of his son's death, which brings the episode to a close. On the other hand, Durmashana does not feel victorious after killing Abhimanyu and mentions that "they are incanting my name, and I, Durmashana, feel nothing. Glory, what glory is this? I am no hero, I didn't defeat him, I murdered him" (Act Two, Scene Two). Prior to his death at the hands of Arjuna, Durmashana considers his ethical stance.

(Re)Visualizing the Cinematic Transitions

The episode's two-dimensional graphics have helped in navigating the camera movement around and adding various viewpoints along with motion to the scenes for fluid cinematic transitions of the characters. The dialogues of the characters are subtitled in the two-dimensional

episode. The technique of illumination is incorporated in two and three-dimensional characters to incorporate a spotlight on the key characters. To prevent motion sickness in the viewer, the three-dimensional episode restricts the movement of the camera. However, the 360-degree rotation of the camera enables an immersive experience for the viewer in the three-dimensional space. The post-production procedure includes using *Adobe Premiere Pro* to stitch the sequences together, enhance the amount of character detail, and improve the color quality of the scenes of the battlefield. Due to computational limitations on the store of the *Oculus Quest*, the episode was uploaded on the *YouTube 360* to expand the accessibility to the viewers. In a virtual reality monoscopic environment, the viewer could operate the camera with a joystick while watching the episode on *YouTube* with an *Oculus Quest* headset.

The post-production process encountered limitations with the software of *Unity*, such as fixing the orientations of the camera angles after the recording. To improve the animated feature and consistency with the surroundings once the figures and the scenery had been blended together, toon-shading and fog effects were added. The color gradient helped to identify the characters and troops on the battlefield. The three-dimensional episode was rendered with 60 frames per second (fps) and 8.000 pixels to improve the graphics of the episode. Correlating the retelling of the epic in the virtual narration, this research draws our attention to the transmedia register of the epic traditions and their intertextual presence across media representations. The paper elaborates on the intermedial demonstration of recreating the episode in a simulated virtual reality environment and explores the possibility

of retelling the epic as an immersive digital experience. Thus, the study suggests the viability of the virtual reality template as a pedagogical praxis for disseminating the epic highlights the adaptation of digital communication and virtual interaction.

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Expanded Digital World: VR, AR, AI, Spectatorship Immersion

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Abstract. This research intends to explore the many concepts and strategies within and beyond the Digital World, by pointing out convergences and divergences between VR – Virtual Reality – versus AR – Augmented Reality –, in a first part of the text, and by bridging AI – Artificial Intelligence – and Human Mind in the second part. After that, the intention is to refer to spectatorship and its trajectory within the new technological trends that brought alternatives to the way cinema and audiovisual are seen and conceptualized in terms of interactivity and immersion. The study is justified, considering that there is still little research that goes beyond the already known devices and that can add new artistic possibilities, despite some articles and books being relevant to the topics analyzed here. The hypothesis is the possibility that already known devices could be the basis for an update with greater scope

and more innovative power to contribute to innovative technologies and new kinds of spectators around the area of artistic communication. The main problem is in the scope of immersion, or the extent to which the spectator participates in the process, whether through equipment or possibilities in the game/art itself. The corpus of the first part includes two VR and two AR products. In the second part, a montage with remix elements from *Alphaville* is based on three points: the power of words, a critical viewpoint of modern society and aesthetics/cinematic scenario, which defies spectators, who can be coauthors, visitors, interactors, emancipated or repertorial. This study develops a dialogue among creation, production and spectatorship in order to bridge theory and practice in a scenario of digital world that emphasizes innovative technologies which are perceived from diverse viewpoints by the appointed concepts of spectatoriality.

Keywords: Digital World · Virtual Reality · Augmented Reality · Artificial Intelligence · Spectatorship Immersion

Introduction

The aim of this research is to explore concepts and strategies within and beyond the Digital World, having the "post-medial concept" of Peter Weibel as a referential source which can provide ways to explain innovative technologies that expanded digital works. According to Weibel, "no single medium is dominant any longer; instead, all of the different

media influence and determine each other" (Weibel, 2006, as cited in Karlsruhe, n.d.). This concept guides the first part of this study, which describes VR – Virtual Reality – versus AR – Augmented Reality –, by pointing out convergences and divergences and also the second part, which tries to bridge AI – Artificial Intelligence – and Human Mind, questioning science fiction in the face of the imaginative power of the human mind. As Weibel (2005) suggests, one media can influence the other and, in this case, AI and Human Mind can exchange knowledge and creativity. The study is justified, considering that there is still little research that goes beyond the already known devices and that can add new artistic possibilities, even considering that some articles and books are relevant to the topics analyzed here.

The selected methodology is the "theoretical-practical", proposed by Elisabete Matallo Marchesini de Pádua (2016) aiming to comparatively analyze two attributes of VR and two of AR that appear to be the same, but differ in some points. In VR there is the singer's interactive show: Imogen Heap – VR Concert (Heap, 2018) and also the game *No Man's Sky* (Bourn, 2016). In AR, the game *Pokémon GO* (Niantic, 2016) and the artistic work *Choir* by Gabriel Barcia-Colombo (2020) are analyzed. The methodology proposed by Pádua develops a dialogue among analyzed issues, seeking to understand what brings them together and what differentiates them and also makes an interaction between theory and practice in the analyses of AI and Human Mind. Her book, Research Methodology: theoretical-practical approach is a pioneer text to use this approach since 1996. Edgar Morin, in the Preface of the 18th edition, mentions that "the reflection about the trajectory of this book could not ignore the impact of information

and communication technologies especially since 2000 with the development of virtual interactive technologies" (Pádua, 2016).

The third part of this study refers to spectatorship, in a complementary way of author-production within new technological trends that expand scenarios bringing alternatives to the way cinema and audiovisual are seen and conceptualized in terms of interactivity and immersion. The hypothesis here is the possibility that already known devices could be the basis for an update with greater scope and more innovative power to contribute to new kinds of spectators around the area of artistic communication. The main process is in the scope of immersion, or the extent to which the spectator participates in the process, whether through equipment or possibilities in the game/art itself. Among the many spectatorship concepts, such as coauthors, visitors, interactors or emancipated, repertorial-spectators are the ones that can be immersed, considering that their extended repertoire allows them to participate more intensively in games and films that require more knowledge and interaction than usual ones. Their immersive participation makes them very actively involved and thus better prepared for AI, VR, AR and all new technological devices that defy spectators.

Summarizing this introduction, we can mention that the corpus of the first part includes two VR and two AR products. In the second part, a montage with remix elements from *Alphaville* is based on three points: the power of words, a critical viewpoint of modern society and aesthetics/cinematic scenario, and in the third part we analyze spectators performances. We conclude that this study develops a dialogue among creation, production and spectatorship

in order to bridge theory and practice in a scenario of digital world that emphasizes innovative technologies which are perceived from diverse viewpoints by the appointed concepts of spectatoriality.

Immersive Interactivity: beyond Virtual Reality and Augmented Reality

This first part of the research, *Immersive Interactivity: beyond Virtual Reality and Augmented Reality* has as its theme the immersion possibilities developed to date, as part of immersive interactivity. In the first case in VR, the interactive show by British singer Imogen Heap took place on August 31, 2018, live, through the *Oculus Rift*, in partnership with the company *WaveVR*, today *WaveXR*, which was the chosen platform. This platform is immersive, interactive and social. Even before the artist's performance, Imogen Heap appeared to talk to the audience who were waiting for her, in virtual space and in real time. The artist's performances were pre-recorded and released at a certain time so that the experience was close to a real show (see Figure 1).

No Man's Sky, launched in 2016, with an update to virtual reality in 2019, from independent producer *Hello Games*, is a procedural action and space exploration game. The player starts at the edge of a galaxy and the objective is to reach the center of it. Along the way, the player explores planets with their unique ecosystems of fauna and flora, and encounters alien populations that can be friendly or hostile. The player can still trade or war with these people. This game is important because it follows the

Figure 1. Performance of artist Imogen Heap's show in VR (Source: The Verge)

Figure 2. *No Man's Sky* gameplay (Source: GOATPixel – IGN Portugal)

entire dynamics of a VR game, and has the most diverse interactions, including multiplayer mode, that is, when several participants act in the same environment in which the interactor plays in real time (see Figure 2).

Moving on to AR, the game *Pokémon GO*, developed by the *Niantic*, *Nintendo* and *Pokémon Company* consortium in 2016, on iOS and Android platforms, was a huge success at the time. The game allows users to capture, battle and train virtual creatures called *Pokémon*. These creatures appear on device screens as if they were in the real world. How does this happen? Through the cameras and the use of the global positioning system (GPS) installed in smartphones compatible with the game. There is also an optional accessory called *Pokémon GO Plus* that alerts players when *Pokémon* are nearby (see Figure 3).

Finally, this study includes the artwork *Choir* (see Figure 4), by American digital artist Gabriel Barcia-Colombo. This work was recently conceived during the lockdown period of the COVID-19 pandemic. *Choir* places the interactor at the center of a virtual choir. As the user approaches each element, images of stylized bodies appear dancing and singing awkwardly on the smartphone or tablet screen. At first, they make simple sounds and then sing real words. The tool used to build this project was *Aero*, which is exclusive to AR editing, launched by developer Adobe in 2019. The artist Gabriel Barcia-Colombo has other works in AR that solidify his artistic trajectory, like *White Light Afterlife, Natural History* and *3 Transitions*.

Exploring the features of VR products, singer Imogen Heap made a significant discovery before performing the 2018 concert in partnership with the company *Wave VR*. She reported that when she interacted with a VR demo

Figure 3. *Pokemon GO* demo (Source: Pokémon GO)

Figure 4. *Choir*, AR performance (Source: Vimeo)

with Adam Arrigo[1] of *Wave VR*, she experienced an intense closeness and connection. She realized that it wasn't a magical, distant space, but genuine human interaction. This

1. C.E.O. (Chief Executive Officer) of *Wave VR*

moment inspired her, leading her to believe that she could create music through this experience (The Verge, 2018).

Next, the show was put together based on two main elements. Initially, the set was filmed in the singer's home, which had previously been used as a bomb dump. *Wave VR* then recorded all the elements available in this space. The second component involved Imogen Heap's performance, which was captured by a Kinect device against a green backdrop with a chroma key, generating color and depth information on the artist. Imogen Heap also wore gloves that transmitted data to the computer, recording her movements. These elements culminated in the creation of a voxel (volume+pixel, or pixel in 3D) hologram. Later, both the hologram and the scenery were organized on the *Unity* platform to recreate everything in VR (The Verge, 2018).

Moments before the show, the singer held a brief meeting with her fans to get feedback on the VR experience. The participants expressed excitement, as they had never experienced anything like it, highlighting the interactivity as the strong point of the experience, an observation also shared by the artist herself during the meeting. Both the artist and the fans were represented as avatars, and the fans' avatars were customizable by themselves, following a predefined pattern developed by the *Wave VR* platform. During the show, fans were immersed in VR, immersed in an environment that mixed special effects with the intimate atmosphere of the artist's home. Interaction between the avatars was also available during the show. Although the event took place in real time for the fans, Imogen Heap's performance was pre-recorded (The verge, 2018; Zimtok5, 2018).

As far as the game *No Man's Sky* is concerned, in 2019, developer *Hello Games* launched a VR version for both PC and Playstation VR. In this mode, the player is immersed in a sensory immersion, involving both audio and video. This is a distinctive feature of VR, marked by the separation from the outside world in favor of the reality visualized by the headset. Within the game universe, the person is represented life-size and, at the start of the experience, must complete a series of small missions to familiarize themselves with the controls, which become more complex as the user progresses through the game. The immersive experience is divided into two different moments: the first when you are exploring the planet on foot, and the second when you are traveling by spaceship, always with a seamless transition between them, without the use of cutscenes[2]. The configuration of the game also plays a significant role in this experience.

In this context, the part about exploring the planet on foot is worth mentioning, as the space travel stage has a few discrepancies compared to a flight simulator. As the player walks around the planet, they have the choice of teleporting between locations using the joystick or opting for smoother control, simulating a real walk, also using the joystick. This approach provides a deeper immersion, making the experience more natural. As for camera movement, in addition to the head movement on the headset, there is also the "snap" command, which changes the orientation of the camera at horizontal angles with quick movements. On the other hand, there is the option of smooth movement, which is

2. A cutscene is a sequence in a video game that is not interactive, interrupting the game play.

more organic and natural for players. Since the VR game is in first person, there is also the possibility of including or not including the character's body. The option with the body provides a more naturalistic experience. Although there are several other control and camera configurations, these are the ones that stand out most in terms of the immersion aspect of the game. Consequently, these settings are more associated with player comfort, considering the possibility of motion sickness, vertigo and headaches due to the intense dynamics of the game.

No Man's Sky has two game modes: one is the story mode, in which you play alone, and the other is multiplayer, which is a little different from other games, as according to *Hello Games* it is possible to create a hub of up to 32 players. However, according to *Xxiou Games YouTube* channel, there are limitations to the multiplayer mode:

> While multiplayer interactions are possible, it's important to note that the vastness of the "No Man's Sky" universe means that encountering other players is not guaranteed. However, you can join friends or coordinate with others through matchmaking options to explore together. As of update 4.0 32 player multiplayer is no longer working. (Xxiou Games, 2023).[3]

Due to *No Man's Sky* having around 18 quintillion planets, as mentioned by Sean Murray, the game's creator, in an interview with CNN Business in 2015 (Hiranand, 2015), it becomes challenging to experience more organic interactivity, as seen in the case of Imogen Heap's show.

3. This citation is in the video information.

Moving on to AR, *Pokémon GO* is an AR game that uses the player's location via GPS on their mobile devices (smartphones or tablets) to create a real-world *Pokémon* hunting experience. When a *Pokémon* appears on the device's screen, the player can tap on it to try to catch it. This involves sliding a *Poké Ball* in the *Pokémon*'s direction, and this dynamic allows the player to earn points and evolve within the game. The gameplay encourages players to explore their surroundings, interact socially, form teams and work together to achieve common goals. The game continues to evolve with regular updates that introduce new features and events. On March 30, 2020, in response to the lockdown implemented in several countries and the worsening of COVID-19, *Niantic* introduced a new game mode called *Pokémon GO Battle League*, allowing players to participate in matches in any location, including indoors, thus reducing the AR experience (The Niantic Live Events Team, 2020).

Gabriel Barcia-Colombo's artwork *Choir* uses AR to create a musical performance, incorporating layers produced by avatars and triggered by the interactor using mobile devices. Both the music and lyrics for the piece were developed independently by Barcia-Colombo, who created the melody on his iPad using *GarageBand*. The recordings were coordinated online via *Zoom*, and Barcia-Colombo distributed the material to four singers, who collaborated using an "exquisite corpse[4]" style for musical notation. They added two separate tracks

4. The exquisite corpse, derived from the French term "cadavre exquis," is a collaborative method for creating a composition where participants contribute words or images sequentially. Contributors follow a set rule or are limited to viewing only the last part of the previous contribution.

over the previous recordings in *Adobe Audition*, resulting in a total of eight vocal parts (Thacker, 2020).

The avatars are stock models that have been customized specifically for the work, with a low-poly, distorted aesthetic. The 3D work involved the use of different software, such as *Cinema 4D*, *Maya* and *Blender*. The animation of the avatars was initially developed in *Mixamo*, concluding the process in *Adobe*'s *Aero* software. The artist's purpose draws attention, as he describes: "I created two versions of the choir: one where they're already singing around you, and one where they're still and only start to sing when you approach them," and he concludes: "As an artist, the idea of virtual characters that respond to your physical presence is really interesting" (Thacker, 2020).

After this presentation of VR and AR devices, it is possible to see that the convergences for the experience indicate that both offer an immersive experience for the user, using technologies that involve the senses, such as sight and hearing, as in the case of the VR game *No Man's Sky* and the work *Choir*. They also involve people in environments that provide a sense of presence and social interaction, such as the audience at Imogen Heap's VR concert or people hunting *Pokémon* in the street using AR.

The differences identified lie in the intrinsic nature of the devices used. In VR, support is limited to the headset, which is responsible for creating a completely virtual and isolated environment, resulting in the exclusion of the perception of the real world, as evidenced in events by artist Imogen Heap or in the game *No Man's Sky*. In contrast, in AR, the use of mobile devices, such as tablets and smartphones, is predominant. These devices add virtual elements to the user's real environment, exemplified in the experience of "seeing

through a window" in *Choir*, or in the game of a real race using virtual space via the smartphone to hit creatures as seen in *Pokémon GO*. Therefore, the cognitive experience of use differs substantially between VR and AR.

Bridging Artificial Intelligence & Human Mind

The second part of this research refers to an introduction of artificial intelligence (AI) in animation creation, which turns out to be a significant milestone in the artistic field. In this context, there was a need to establish a relationship between the new animation *Omegaville* by digital artist flvz_ and the film A*lphaville* directed by Jean-Luc Godard. The purpose here was to explore the points of convergence and implications of this new path taken by AI in animation production. The film *Alphaville* falls into the genre of science fiction noir and addresses the theme of AI through the character *Alpha 60* (see figure 5). This unique narrative is being constructed primarily by AI, opening up a new horizon in animation creation. However, the reflection here goes beyond the mere path explored by AI. What is intriguing is the implication of this new technology, where humans only need to press a few buttons to develop an artistic work that, in a more traditional manner, would require a long period of time to conceive.

This question can be approached from three distinct perspectives that converge to a relevant conclusion. In the film *Alphaville*, *Alpha 60* asks Caution, "Do you know what illuminates the night?" The protagonist's simple answer is "Poetry" (Campos, 2015).This seemingly trivial word may encapsulate something that AI may not fully grasp, and

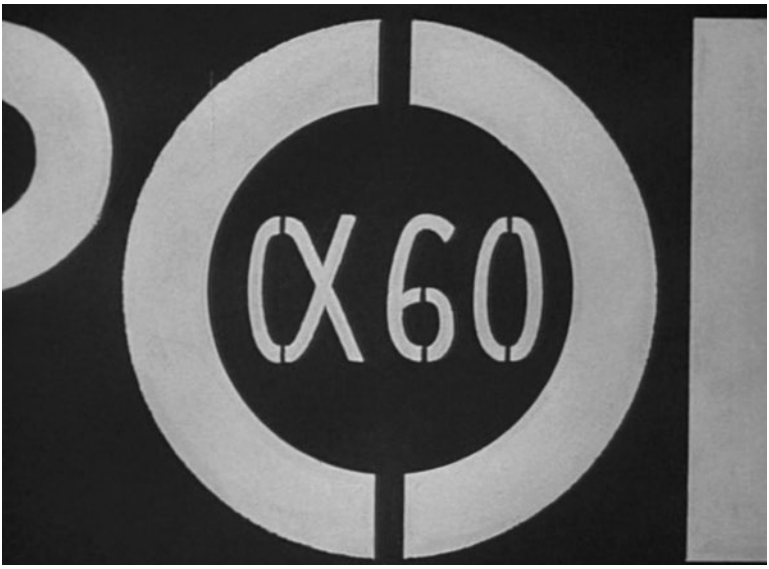

Figure 5. *Alpha 60*, AI in Godard's movie (Source: film screenshot)

that makes all the difference. The word "poetry", derived from the Greek word "poiesis", refers to human expressions such as creativity, imagination, and reflection. Will AI be capable of being creative, having emotions, and developing imagination to surpass the usual powers of computers? Or will it be limited to working mechanically? In *Alphaville*, Godard explores this dilemma, questioning science fiction in the face of the imaginative power of the human mind. The current conclusion is that there must be a dialogue between AI and this work as an animation creator, so that there can be a reflection on the artistic development of a screenplay in an era of technological innovation. The objective here is to create a bridge between the use of AI,

which assists mechanically, and the imagination to develop a relevant and unique montage.

To achieve this, it is necessary to create a montage with remixed elements from *Alphaville* based on these three points: the power of words, criticism of modern society, and aesthetics/cinematic language. Regarding the first point, the power of words: the film's protagonist, Lemmy Caution, a private detective, is sent to Alphaville to find and destroy *Alpha 60*. He discovers that the word "love" has been banned and can no longer be used. Throughout the film, the power of words is explored as a force of resistance and humanity amidst the tyranny of technology. On the second point, Godard uses the dystopian setting of *Alphaville* to criticize modern society and the growing influence of technology. The film addresses issues such as alienation, conformity, dehumanization, and the loss of human values in the face of technological advancement. Godard portrays a society where people become mere automatons, living in oppressive conformity and being controlled by an impersonal system. The social critique present in *Alphaville* raises questions about individual freedom, the importance of emotion, and the preservation of humanity in an era dominated by technology.

Regarding aesthetics/cinematic language: *Alphaville* is known for its unique aesthetics and innovative approach to cinematic language. Godard employs unconventional filming techniques such as unusual camera angles, expressive lighting, and fragmented editing, creating a distinct and evocative atmosphere. The film's visual aesthetics reflect the coldness and alienation of the depicted dystopian society, while establishing a poetic and metaphorical atmosphere. Godard's bold and

experimental cinematic language contributes to the provocative and reflective nature of Alphaville, making it a work that transcends the conventional boundaries of cinema. In developing the animation, the *ChatGPT* is used, a web application of artificial intelligence. It is then asked about the essential elements present in Godard's film *Alphaville*. The machine comes back with a few points, among which three main themes are chosen: "the power of words, the critical perspective of modern society, and the aesthetic/cinematographic setting of the film". These themes guided the creation of the short film entitled *Omegaville*. The concept behind this project involves remixing, replacing the word *Alpha* with *Omega*. In this context, *Omega* symbolizes the "end of a period". The question then arises: have we reached the culmination point where artificial intelligence will play an omnipresent role in audiovisual production? Subsequently, in an effort to match the aesthetics of the film *Alphaville*, an artificial intelligence model called *Pulp Art Diffusion* is downloaded from the *Civitai* website (2022), recognized as the most popular repository of models trained for use in *Stable Diffusion*. This model is then installed on the computer. The framework used to access *Stable Diffusion*, *Automatic 1111*, incorporates an extension called *Deforum*, which represents the space in which the animations are generated. The intention is to produce a 60-second animation with a total of 1800 frames at a rate of 30 FPS and a resolution of 768 x 512 pixels, with the possibility of upscaling the video later. The three prompts (text-for-image) derived from the main ideas – the power of words, the critical perspective of modern society and the aesthetic/cinematographic

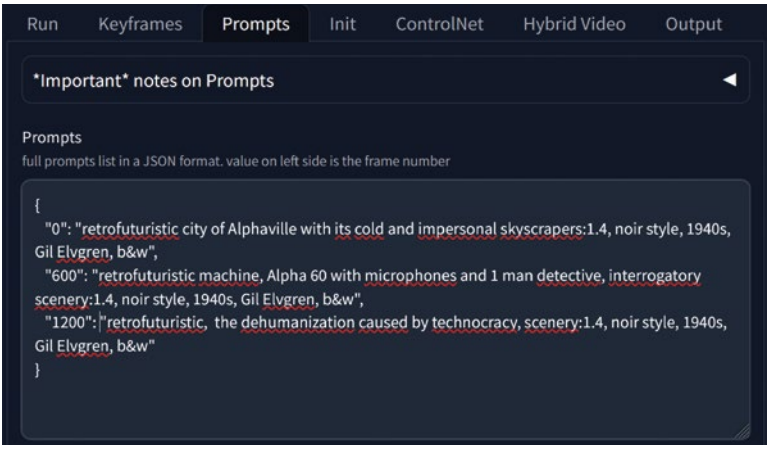

Figure 6. Prompts making *Omegaville* (Source: flvz_)

setting of the film – are inserted into the process. Each prompt is described below, in the style of the Gil Evgren artist, divided by frames 0/600/1200, like a script. (see figure 6).

The animation process involves several stages, one of which is the curation of the generated images, as it is rare for a video to be ready for presentation immediately. The configuration of the image generation parameters in the *Deforum* extension plays a crucial role in obtaining a satisfactory result. Below is the final result of *Omegaville*, as illustrated (see figures 7, 8 and 9).

The integration of AI in animated creation marks the advent of a new frontier in artistic expression. However, pertinent questions arise about AI's ability to truly capture the essence of human creativity. Poetry, as mentioned earlier, exemplifies a form of artistic expression that may be challenging to replicate by a machine. Human

Figure 7. *Alphaville* with impersonal skyscrappers in *Omega-ville* movie (Source: flvz_)

Figure 8. Alpha 60 interrogatory scene (Source: flvz_)

Figure 9. The dehumanization caused by technocracy (Source: flvz_)

creativity is often driven by emotions, experiences, and unique perceptions, elements that may be difficult for AI to be fully comprehended. Although AI has demonstrated remarkable advancements in specific tasks such as pattern recognition and data processing, its ability to generate new ideas or original concepts is still limited. While AI may be able to produce scripts or montages based on provided stimuli, it is important to recognize the role of the artist as a fundamental creative agent in constructing a complex artistic narrative.

However, this does not mean that AI does not have a valuable role in animation creation. Unlike this, technology can be a powerful tool to accelerate the creative process, assist in idea generation, or even provide inspi-

ration for artists. The combination of human intelligence and artificial intelligence can result in remarkable works exploring the possibilities and limits of both domains.

Spectatorship Immersion

The aim of this third part is to analyze in which ways production and spectatorship of films were affected by innovative technologies, and how these technologies are giving rise to a new digital scenario. Spectatorship has been one of the themes that deserved attention since the beginning of the image in movement, especially with Méliès´ magical tricks and his *Voyage to the Moon*, which became an icon of montage considering the time in which it was produced. Although technology has always been part of filmmaking from its beginning, especially when silent films added sound and evolved from black and white to technicolor, the most relevant change within cinema trajectory was the shift from analog to digital technology.

The advent of digital technology has changed communication ways in relation to audiovisual production and spectatorship which provoked relevant reactions. Gene Youngblood coined a concept of "expanded cinema" including video art, new technologies for special effects, computer art and holography, among others: "We live in an age of hyper-awareness, our senses extend around the globe, but it's the case of aesthetic overload: our technical zeal has outstripped our psychic capacity to cope with the influx of information" (Youngblood, 1970, p. 58).

Wim Wenders, in his 1982 documentary film *Room 666*, collected some comments from film directors concerning

the future of cinema, during Cannes Cinema Festival 1982, reflecting about the future of cinema, what he anticipated as the death of cinema. However, in Gustavo Spolidoro´s *Return to Room 666* (2008), Wenders justified:

> in that time we thought that the video and the television would destroy the language of the cinema. What happened was the exact opposite. New languages were discovered. Cinema is new as it always has been, because people need it. They need this tool more than anything. (Wenders, 2008)

Twenty six years later, Spolidoro adapted archive images of Wim Wenders (narrator), Jean Luc Godard, Michelangelo Antonioni, Rainer Fassbinder, Steven Spielberg and Werner Herzog, for his remake (see figure 10).

Figure 10. *Back to Room 666* (Source: YouTube)

Lev Manovich coined the concept of "post-media aesthetics", suggesting that "postmedia aesthetics should adopt the new concepts, metaphors and operations of a computer and network era, such as information, data, interface, bandwidth, stream, storage, rip, compress" (Manovich, 2000, p. 6). Peter Weibel, in his concept of "post-medial condition", argued that all media influence each other and are mutually dependent:

> the art of the technical media, i.e. art which has been produced with the aid of a device, constitutes the core of our media experience. This media experience has become the norm for all aesthetic experience. Hence in art there is no longer anything beyond the media. No-one can escape from the media. (Weibel, 2006, p. 98)

Also in 2006, Henry Jenkins, in his book *Convergence culture: where old and new media collide*, explains his argument: "a situation in which multiple media systems coexist and where media content flows fluidly across them" (2006: 282). Five years later, Steven Shaviro (2011), in his essay "What is post-cinematic?", makes a relevant comment:

> We still make and watch movies, just as we still broadcast on and listen to the radio, and still write and read novels; but we produce, broadcast, and write, just as we watch, listen, and read, in different ways than we did before. (Shaviro, 2011)

As a counterpoint, Shane Denson and Julia Leyda believe that the post-cinematic perspective challenges us to think about the affordances (and limitations) of the emerging media regime not simply in terms of radical and unprecedented change, but in terms of the ways that post-cinematic media are in conversation with and are engaged in actively

re-shaping our inherited cultural forms, our established forms of subjectivity, and our embodied sensibilities (2016, p. 1).

Our point here is that spectatorship has changed after television adopted streaming patterns and, even more, when digital technology included VR, AI, and other immersive strategies. It was not only the beginning of a home TV possibility as substitution for cinema theaters, offering ways of stopping films, rewinding them, seeing details again, making it possible for multiple activities at the same time, but also new ways for interaction and immersion. Moreover, interactive films include the spectator, now called "interactor", by Janet Murray (2003), who can change film endings or even scenes of films, due to a selection of options offered to make decisions and have their own choices.

According to Janet Murray (2011), in her Glossary, "Immersion is an experience of the interactor, a sense of being contained within a space or state of mind that is separate from ordinary experience, more focused and absorbing, and requiring different assumptions and actions (like swimming when immersed in water)". The author complements saying that

> Immersion is further reinforced in digital environments by the **active creation of belief**, by which the interactor is cued to explore and to take actions within the immersive world and is rewarded for the actions with appropriate responses. **Immersion and interactivity** are characteristic pleasures of digital environments. (Murray, 2011)

Some authors have coined concepts of spectatorship that deal with a more active kind of spectators. Lev Manovich suggested a "coauthor-spectator". Manovich (2000) sees

the emergence of a new paradox: while spectators are no longer fixed in their static roles as observers of ready-made images, VR imprisons the body by tying it to the machine. The split identity of spectator in both the physical and the representation, for the author, is "the tradeoff for the new mobility of the image as well as for the newly available possibility to represent any arbitrary space" (p. 113). Although the future might be one in which "all 'real' actions take place in the virtual" (that idea of individuals carrying their own prisons doesn't seem to worry Manovich), the author concludes the chapter with the addendum: "a screen is still a screen…We still have not left the era of the screen" (pp. 114-115).

On the issue of authorship, Manovich (2000) suggests the user as the "coauthor" of a program "choosing the values from a number of predefined menus" (p. 128). But, again, the user can only select those options that the author/programmer constructs. Manovich seems to value the variability of websites, for example, because of users' equipment (like screen resolution) and connections. Philippe Rancière (2007) suggests the "emancipated spectator" and claims that:

> emancipation starts from the principle of equality. It begins when we dismiss the opposition between looking and acting and understanding that the distinction of the visible itself is part of the configuration of domination and subjection. It starts when we realize that looking is also an action that confirms or modifies that distribution and that "interpreting the world" is already a means of transforming it. (Rancière, p. 277)

Rancière also explains that "the common power of spectators is the power of the equality of intelligences.

This power brings individuals together to the very extent that it keeps them apart from each other; it is the power each of us possesses in equal measure to make our own way in the world" (Rancière, 2007, p. 278).

In our point of view, instead of mentioning "equality of intelligences" as Rancière mentions, we suggest the "repertorial-spectator", a spectator who has a repertoire able to really understand the kinds of scenarios that demand a knowledge of the use of technologies and the immersive interactivity that some works offer to be thoroughly analyzed in their potentialities. If spectators cannot fulfill these demands, they can belong to what Philippe Dubois (2014) describes as a "visitor-spectator".

"Repertorial-spectators", however, instead of being only "visitors", have to make use of their knowledge of cinema, technology and immersive techniques in order to be able to identify clips and perceive in their minds how expanded works in AI, VR and AR montages use devices that most of the time surpass the usual artworks. This is the challenge that defies "repertorial-spectators".

Conclusion

This study follows the theoretical-practical methodology, creating a bridge between academic concepts and professional artworks that defy spectators who have to be repertorial to be able to understand immersive interactivity and all advances in innovative technologies. With the possibility to have multimodal virtual platforms, the spectator can wear 3D glasses to enter the platform and can also choose an avatar, being considered what

we suggest as an "avatar interactor", which can also be a "repertorial-spectator", able to grasp the meanings of new immersive technologies in order to fully understand the offered possibilities of interactivity.

Considering all the changes from 1967 to present, our conclusion is to call the new scene an immersive interactivity that offers possibilities of games and films that expand boundaries and allow communication in different contexts, mainly through computers, smartphones and laptops, which became valuable tools. Remote activities could get people from all countries in the world together, facing each other and interacting, as IAMCR conferences have done for three years having remote conferences since 2020. From now on, new possibilities of interaction may be offered, such as hybrid meetings, classes and home office work using advanced technological methods, which Baudrillard would call "a new age of simulacra", but in our point of view, new activities have positive points that can challenge spectators' creativity and ability to exploit new territories. Although Sherry Turkle entitled one of her most recent books *Alone Together*, referring to social networks, we can communicate instantly with all nations from our iPhones, laptops, apps and websites dedicated to sharing ideas and news. Besides, as Michelangelo Antonioni stated in the film *Room 666*, "we have to adapt in order to survive".

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In the various texts that this Dossier brings together, the central point is the results that digital media technologies have provided for different cultures. In this context, the authors analyze the creation of the image, the impact of algorithms on the news and the audience, the audiovisual associated with VR (Virtual Reality) and the viewer, the industrial production and the multicultural globalization.

We believe that the questions that permeate the texts and the paths that the authors followed in their studies are sources for new discussions and suggest a wide range of developments for future research. Furthermore, these are essays that make us think about who we are and how we live in a world that is increasingly closer to digital media.

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