



## **Beyond Representation: Augmented Reality as a Narrative Medium in the Third Wave Media Landscape**

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### **Abstract**

This article offers a theoretical and analytical examination of the relationship between Alvin Toffler's Third Wave framework and the structural transformations in the media industry amid the rise of immersive media. Particular attention is given to augmented reality as an emerging narrative medium that is reshaping media production processes, narrative forms, and audience engagement. The study is grounded in the hypothesis that immersive media does not merely represent a technological enhancement of modes of presentation, but rather embodies a profound manifestation of Third Wave logic, characterized by fragmentation, decentralization, de-massification, personalization, and interactivity. The article aims to construct an integrated theoretical framework linking the concepts of the Third Wave, immersive media, and interactive storytelling. It also provides a critical analysis of the role of augmented reality in redefining news and media narratives, transforming audiences from passive consumers into active participants, and transcending traditional boundaries between physical reality and digital representation.

**Keywords:** Third Wave; Immersive Media; Augmented Reality; Interactive Storytelling

## Introduction

Since the mid-twentieth century, the media industry has undergone profound transformations that extend beyond mere technological advancement to encompass the epistemological and communicative structures governing the production and circulation of meaning. Alvin Toffler's Third Wave framework has emerged as one of the most influential interpretive models for understanding these structural shifts, conceptualizing them as a historical transition from an industrial society based on standardization, linearity, centralization, and material industrial foundations, to an information- and knowledge-based society characterized by fragmentation, plurality, flexibility, and the erosion of uniformity.

Within this context, media is no longer merely an institutional apparatus for the one-way transmission of messages; rather, it has become a dynamic space for the production of experience, interaction, and participation (Cheriti et al., 2025). This transformation is particularly evident in the rise of what is commonly referred to as immersive media, which encompasses technologies such as virtual reality, augmented reality, mixed reality, 360-degree video, and spatial computing. Among these, augmented reality stands out as one of the most significant manifestations of this shift, given its capacity to integrate digital layers into physical space and to reconfigure the relationship between medium, content, and audience. Accordingly, the central problem of this article is articulated through the following question: To what extent can augmented reality be considered a new narrative medium that embodies the logic of the Third Wave in media production?

### *Objectives of the Study*

This study aims to achieve several key objectives, including:

- a) Analyzing the logic of the Third Wave and its impact on contemporary transformations in the media landscape.
- b) Exploring the concept of immersive media and identifying its fundamental components.
- c) Clarifying the role of augmented reality as a new narrative medium.
- d) Opening new research perspectives for examining augmented media practices within the communicative context of the Third Wave.

## I. Background

### *The Concept of Immersive Media*

The core idea of immersive journalism lies in enabling participants to actively enter a virtually reconstructed scenario that represents the news story. Participants often appear as a digital avatar, a three-dimensional animated representation of themselves (de la Peña, Ausias Pomés, Spanlang, Friedman, Sanchez-Vives, & Slater, 2010). Slater and Wilbur define immersive media and immersive systems as “digital media systems designed to generate a psychological and spatial sense of presence, allowing users to interact with the

content as if it were part of reality” (Slater & Wilbur, 1997). Pavlik describes it as “an advanced stage of digital journalism that relies on extended reality technologies to create multi-sensory, interactive news experiences that enhance understanding, engagement, and trust” (Pavlik, 2019).

Similarly, Eva Dominguez argues that immersive media represents “an evolution in journalistic publishing that transcends the traditional linear structure of news, reorganizing the relationship between the story and the audience through immersion, interaction, and exploration” (Dominguez, 2017).

### ***Definition of Augmented Reality***

The term “augmented reality” was first coined by researcher Tom Caudell at Boeing in 1990, when he was tasked with improving schematics and instructional tools used to guide workers on the factory floor. He proposed replacing large wooden boards containing electrical wiring instructions for each aircraft with a head-mounted device that could display airplane schematics through high-tech glasses and project them onto reusable panels. Milgram and Kishino defined augmented reality as “all cases in which the perception of a real environment is enhanced by virtual (computer-generated) elements.”

Azuma described augmented reality as “a form of virtual environment” that allows “users to see the real world with virtual elements integrated or overlaid within the same display” (Saeghe, Abercrombie, Weir, Clinch, Pettifer, & Stevens, 2020).

Another definition presents augmented reality as a live, direct or indirect view of the physical, real-world environment, whose elements are enhanced with computer-generated inputs such as audio, video, graphics, and digital data. Using advanced AR technologies and object-recognition systems, this creates a more interactive layer of information about the surrounding real world. Due to the novelty of the concept, several terms have emerged to refer to it, including “augmented reality,” “enhanced reality,” and “merged reality” (Yahya, 2020).

Yet another definition describes augmented reality as “a collection of computer-generated graphics, text, video, and audio digitally overlaid on the real world, which interact in real time via a smartphone, tablet, computer, or specialized glasses equipped with appropriate software and camera” (Al-Shammari, 2017).

### ***Characteristics of Augmented Reality***

Since augmented reality (AR) integrates the real world with the virtual world, it possesses a set of defining characteristics. According to Anderson and Liarokapis, these include:

- a) The integration of digital objects into the user’s real environment.
- b) The seamless blending of digital objects with the real-world environment.
- c) Immediate and real-time interaction between digital and physical elements.
- d) Concise and clear access to information.

- e) The combination of interpretation and digital objects (Al-Baradai & Al-Akiah, 2019).

Azuma also identifies three key characteristics of AR:

- a) The merging of real and virtual elements within a real environment.
- b) Real-time interactivity during use.
- c) The presence of three-dimensional (3D) objects (Azuma, Bailiot, Behringer, Feiner, Julier, & Macintyre, 2001).

These features collectively make AR a powerful tool for enhancing perception, interaction, and understanding within both educational and media contexts.

### Applications of Augmented Reality

The importance of augmented reality (AR) lies in its ability to enhance users' perception of the real world and their interaction with it. AR has been applied across a wide range of fields, including:

- a) **Medical Field:** Medical AR aims to visualize patient data within the same physical space, requiring direct and synchronized display of collected information. Roberts and his team implemented the first medical AR system. Another application involves ultrasound imaging, where technicians can see a three-dimensional image of a fetus overlaid on the mother's abdomen.
- b) **Military:** AR has been used for urban training simulations, displaying dynamic terrains for military intervention planning. Canada developed an AR-based night vision system for helicopters to extend operational range and improve pilots' navigation in low-visibility conditions. AR also enables training for complex combat scenarios, including real-time simulation of enemy actions.
- c) **Industrial and Manufacturing:** Research focuses on developing AR-based manufacturing systems to enhance production processes, improve product development, reduce time and costs, and increase quality. AR supports understanding of assembly tasks by projecting instructions and animations directly onto products on the assembly line as needed.
- d) **Visualization and Graphic Representation:** AR can be integrated with printed books to provide 3D content for children, enhancing comprehension of abstract or invisible concepts.
- e) **Entertainment and Gaming:** AR has been used in gaming and sports broadcasting to highlight important elements, display virtual advertisements, or overlay products. For example, AR allows precise tracking of hockey pucks (Fox-Trax system), cars, or balls in races and sports arenas.
- f) **Robotics:** AR serves as a platform for human–robot collaboration. It has been applied in medical robotics and image-guided surgery, with predictive displays for remote control. AR has been integrated with robotic surgery systems to visualize inputs, outputs, and the robot's status.
- g) **Education:** Educational researchers increasingly recognize AR's potential for teaching and learning. By co-locating virtual objects and real environments, learners can visualize complex spatial relationships and abstract concepts. AR is expected to be a major emerging technology in education over the next five years.

- h) **Marketing:** AR was first used in advertising within the automotive industry. Special printed materials were recognized by webcams, displaying a 3D model of the advertised car on screen. This approach has since expanded to computer games, films, footwear, and furniture marketing.
- i) **Navigation and Route Planning:** Narzt et al. discussed pedestrian and vehicle navigation models displaying routes, highway exits, accompanying vehicles, hazards, and fuel prices via PDAs and mobile phones. Results showed a significant reduction in navigation errors when using AR screens compared to conventional displays.
- j) **Tourism:** The ARCHEOGUIDE project is an AR-based cultural heritage field guide providing visitors with archaeological information. Interactive AR systems have been developed to enhance cultural tourism experiences, including historical tours on mobile devices.
- k) **Geospatial Applications:** AR hardware and software have been used to represent and process collaborative geographic data. AR can visualize environmental barriers and their locations on terrain. Integrating AR with Geographic Information Systems (GIS) allows immersive visualization of landscape changes.
- l) **Urban Planning and Civil Engineering:** AR supports decision-making in architecture and interior design. Distributed AR systems have been developed for collaborative design applications, exploring the relationship between perceived architectural spaces and structural systems. AR has also been used to improve construction inspections, building restoration, and visualization of architectural designs in outdoor environments (Mekni & Lemieux, 2014).
- m) **Media:** AR has been widely adopted across print, television, and online journalism. Its impact on media and communication structures is profound: visual storytelling has become multi-layered, immersive, and interactive, transforming audiences from passive recipients of linear news into active participants engaged with rich, multidimensional narratives.

## Stages of Designing and Producing Augmented Reality Applications

The process of designing and producing augmented reality (AR) applications involves a series of integrated methodological stages aimed at achieving effective integration between virtual digital elements and the real environment, thereby ensuring a successful user experience. These stages can be outlined as follows:

### 1. Identification Stage:

The identification stage forms the structural foundation of any AR application. During this phase, the main objectives of employing the technology are determined, whether they are educational, journalistic, cultural, or entertainment-oriented. This stage also involves selecting the real-world subjects and elements on which AR will be applied, while taking into account the nature of the communicative context and the target audience.

### 2. Creation Stage:

In this phase, the digital content to be used in the augmented experience is prepared and developed. This includes producing images, videos, sound effects, 3D models, and other virtual elements. When designing this content, it is important that it is derived from or complements the real world, in order to serve the application's objectives and enhance its visual and cognitive impact.

### ***3. Linking Stage:***

The linking stage involves establishing a technical and synchronous connection between virtual elements and real-world scenes. The goal of this phase is to present digital elements as an integral part of the real scene, achieved by accurately adjusting spatial, motion, and temporal coordinates. This ensures visual and functional harmony between the real and virtual worlds.

### ***4. Detection / Recognition Stage:***

The detection stage occurs when the camera of an AR-enabled device—such as a smartphone or tablet—is directed toward the target real-world element or scene. The system then recognizes this element based on a database associated with the application. Once the element is accurately identified, the corresponding virtual content is retrieved and the augmented scene is displayed to the user.

### ***5. Integration Stage:***

The integration stage represents the final outcome of the AR design and production process. Pre-prepared virtual elements are merged with the real-world scene captured by the camera into a single visual frame. This produces a fully immersive augmented experience in which the added digital elements appear as a natural part of reality, enhancing the sense of realism and supporting user understanding and interaction (Hassan, 2025).

## **The Concept of the Third Wave and Wave-Based Division of Civilization**

Alvin Toffler was born in the 1930s in Pennsylvania, USA, into a modest working-class family. He became one of the most prominent futurists, gaining global recognition; his writings influenced thinkers in China, Russia, including Mikhail Gorbachev, and many other countries. Early in his career, Toffler focused on social problems and political change. In the 1940s, he married Heidi, who collaborated with him on much of his scholarly and intellectual work. His fame grew after the publication of *Future Shock* (1970) and later *The Third Wave* (1980), his most influential work, in which he divided human civilization into three major historical waves, predicting the characteristics and outcomes of the Third Wave (Al-Mahbashi, 2022). Toffler approached history in an unconventional way, reversing the traditional methodology. Whereas historians typically examine the past to understand and explain the present, Toffler sought to predict the future in order to inform the present. His historical analysis emphasized social processes and communication between past and present, using the concept of “wave progress” as a research tool to track societal developments and identify change as the central driver of historical events (Mahmoud, 2025). Toffler classified humanity into two major historical waves that reshaped human civilization before introducing the Third Wave:

- a) The First Wave emerged with the discovery of agriculture as a primary source of wealth, taking thousands of years to develop fully.
- b) The Second Wave corresponded to the Industrial Revolution, which lasted roughly three hundred years, reflecting the acceleration of societal change.

The Third Wave, which Toffler heralded, is the era of technological and communication revolutions in which we currently live. He described its transformative impact: “This wave will affect every individual; families will fragment, economies will be disrupted, political systems will be paralyzed, and traditional values will be overturned. It challenges the old power relations and elite privileges, creating the grounds for future struggles” (Abdel-Al, 2021). According to Toffler, the Third Wave civilization began emerging in the United States and Europe in the mid-1950s. Although not yet fully consolidated, it is rapidly evolving due to the accelerating pace of scientific progress, particularly in computer science and electronics, ushering in the Information Age. The Third Wave arose from within the Industrial Civilization of the Second Wave, and its advance inevitably encounters resistance, as it disrupts familiar patterns and structures of the preceding industrial era (Abdel-Basset, 2018). In *The Third Wave* (1990), Toffler predicted the gradual dismantling of Second Wave structures: standardized uniformity would erode, specialization would be targeted, centralization would give way to decentralization, and linear processes would transform into circular, interactive systems. The roles of producer and consumer would merge, giving rise to the “prosumer” or “consum-ducer,” in which the relationship between production and consumption becomes reciprocal.

Toffler symbolically divided the world into three competing civilizations: the First Wave represented by the axe, the Second Wave by the assembly line, and the Third Wave by the computer. Each contributes differently: the First Wave provides agricultural and mineral resources, the Second Wave provides cheap labor and mass production, while the Third Wave seeks to dominate through knowledge creation and its strategic application (Toffler, *Building a New Civilization*, 1996).

Consequently, Third Wave nations export information, media, innovation, advanced management, high culture, technology, software, education, vocational training, healthcare, financial services, and other high-value services. They also possess superior military capabilities rooted in advanced technology—a phenomenon demonstrated by technologically advanced countries supporting Kuwait and Saudi Arabia during the Gulf War, where Third Wave “products” rather than Second Wave commodities dominated. Toffler’s predictions have been remarkably accurate. The technological revolution, particularly in communications, the internet, and digital technologies, has transformed societies as he anticipated. He also foresaw the information overload problem, the economic and technological shifts, the spread of democracy, advancements in cloning, and the personal computer revolution (Al-Samarai, 2021). Toffler argues that we are the last generation of an old civilization and the first generation of a new one, and that a certain degree of personal disruption, anxiety, and confusion can directly manifest as conflict within ourselves and within our political institutions—a struggle between the declining Second Wave civilization and the emerging Third Wave civilization (Toffler, *The Third Wave*, 1990).

The Third Wave emerged from the womb of industrial civilization—the Second Wave—which had reached its peak. The final historical turning point occurred in 1955, a decade that witnessed the widespread adoption of computers, commercial jet aviation, and the birth control pill. It was during this decade that the Third Wave began to consolidate its strength in the United States. The Third Wave introduced a completely new lifestyle based on diverse and renewable energy sources, production methods that rendered traditional factory assembly lines obsolete, and institutions of a new type, which Toffler termed the

“electronic cottage”, spanning schools, companies, and labor unions. The Third Wave would establish new behavioral norms and progressively reduce reliance on partners in First- and Second-Wave countries, except for markets, while intra-wave trade within Third Wave nations would increase (Toffler, *Building a New Civilization*, 1996).

Americans, according to Toffler, are moving toward a knowledge-based science rather than one grounded in agriculture or manual labor. This does not mean that the Third Wave sector is confined to information, electronics, or biotechnology alone; it extends to various fields such as finance, software, entertainment, media, advanced communications, healthcare, and, in general, any domain based on intellectual activity rather than physical labor (Filali, 2003). The primary resource of the Third Wave is what Toffler calls “actionable knowledge”, encompassing data and information in textual and visual forms, as well as culture, ideology, and values. The Third Wave thus ushers in a new era—the Knowledge Age (Heath, 2013). The computer, with all its capabilities, represents humanity’s greatest achievement. It enhances the power of our minds, making them more attuned to an intelligent environment. We will learn to communicate with computers and to use them with agility in ways that are difficult to imagine today (Toffler, *The Third Wave*, 1990). The commercial world that Toffler envisioned reflects familiar trends: the end of mass production, the fragmentation of media, intelligent environments, the decline of traditional secretarial roles, the rise of remote work, accelerated transactions within companies, the disintegration of mass society, and increasingly diverse family structures.

## II. Methodology

This study adopts a descriptive–analytical approach, as it is considered the most appropriate method for exploring communication phenomena. This approach is primarily employed to identify and analyze the core concepts of the Third Wave, augmented reality, immersive media, and their applications. In addition, a critical approach is integrated to examine the structural transformations imposed by modern technologies on the architecture of traditional media and on the key actors within the communication process—namely journalists and audiences—and to assess how these transformations relate to the predictions articulated by Alvin Toffler’s Third Wave theory.

## III. Manifestations of Third Wave Logic in Augmented Reality

Through his social analysis of civilizational waves, Toffler highlighted the importance of media and its transformations in the Information Age or post-industrial society. In this context, **augmented reality (AR)** can be understood as a modern technical expression of media and a knowledge-based intermediary, demonstrating Third Wave logic in several ways:

- a) **Augmented Reality as an Embodiment of Knowledge and Immateriality:**  
In analyzing media transformations in the Third Wave, Toffler anticipated an environment in which computers interact with users through voice, capable of recognizing and responding to a vocabulary of a thousand words or more. Companies are in a constant race to expand vocabularies and simplify technology, eventually programming smart environments, including walls, to “speak” (Toffler, *The Third*

*Wave*, 1990). This vision parallels AR, where computers integrate virtual elements with real-world environments, creating interactive, intelligent experiences.

b) **Transition from Material to Knowledge-Based Economy:**

The Third Wave marks a shift from a material-industrial economy to a knowledge-based economy, where “things” become “information” and “products” transform into “data-driven services.” AR aligns with this transformation by:

1 **Converting media content from material to digital knowledge layers:**

AR overlays real-world visuals with digital data that explain, expand, or reinterpret sensory information. Thus, a media event transforms from a mere “image” into a dynamic set of information layers integrated with reality—illustrating the immateriality central to the Third Wave.

2 **Enhancing the knowledge economy:**

AR relies on real-time data processing, algorithmic integration, and delivery of information through cognitive interfaces. These elements reflect the transition from material value to data and cyber-intelligence value.

3 **Accelerating the knowledge cycle:**

AR converts raw or complex information into interactive visual representations delivered instantaneously to users. Interactive maps, visualizations, and real-time overlays simplify complex concepts and immerse audiences in enhanced environments where real and virtual realities merge. This facilitates faster, more efficient knowledge transfer, realizing the Third Wave principle of accelerating the *information time* compared to traditional media.

### ***Media Personalization and the Role of Data: Toward Individualized Media***

The concept of “audience fragmentation” and the shift from mass broadcasting to personalized media is one of the core pillars of the Third Wave. Augmented reality (AR) plays a central role in this transformation through:

- a) Customized content based on user preferences: AR platforms analyze location, interests, personal activity, and usage context to deliver unique media content tailored to each individual. Each user receives “their own version of the event”, surpassing the one-size-fits-all model of Second Wave mass media.
- b) Location-based content: This approach exemplifies decentralization and personalization. A user at a specific journalistic event or geographic location experiences information layers that differ from those seen by another user elsewhere.
- c) Integration of AR with artificial intelligence: AI enables AR systems to understand user patterns and behaviors, allowing the creation of highly personalized content. This realizes a key principle of the Third Wave: the fragmentation of mass production and its replacement with individualized micro-production.

In light of Toffler’s Third Wave perspective, AR represents a qualitative shift in the nature of the media intermediary, rather than merely a technological advancement. The Third Wave does not simply replace one medium with another; it profoundly reorganizes the relationship between knowledge, time, space, and the individual’s role within the communication system. AR operationalizes this shift, moving media from the logic of pre-packaged industrial messages to the logic of integrated, information-rich environments embedded in reality.

### ***Fragmentation of Industrial Time in Favor of Interactive Time***

In industrial media associated with the Second Wave, messages were produced as complete units and broadcast to a wide audience within a fixed temporal framework, reinforcing a linear pattern of narration and reception. In augmented reality, meaning is not delivered as a closed unit; rather, it forms dynamically through informational modules that activate during use, depending on spatial context, moment in time, and user interaction. Media thus shifts from a transmission act to a procedural, knowledge-based process, consistent with Third Wave logic, which reproduces value through knowledge and context rather than through quantity and uniformity. This shift results in a clear deconstruction of industrial media time. Instead of the fixed rhythm that governed broadcasting and publishing in the Second Wave, AR operates in real time and nonlinearly, linking information to action rather than to a schedule. This temporal restructuring reflects Toffler's prediction of societies moving toward flexible, multiple temporalities that adapt to individual needs instead of enforcing a unified, collective pace (Cheriti, 2025).

### ***Redefining Space***

Temporal transformation is inseparable from the reconfiguration of space within the communication process. Industrial media separated messages from the physical environment, delivering them through independent channels. AR, by contrast, integrates information directly into lived space, making location an active element in meaning-making. Reality itself becomes a media intermediary, linking knowledge to sensory experience and spatial context, effectively reintegrating information into daily life instead of isolating it within closed industrial institutions.

### **Transformation of the Audience Role**

In this context, the audience's position changes without eliminating the logic of structure and control. In augmented reality (AR), the user is no longer a passive recipient; instead, they actively engage with the content and guide the trajectory of their experience. However, this interactivity occurs within a pre-programmed technical framework, accurately reflecting Toffler's concept of the prosumer, where production and consumption roles overlap—not as complete liberation, but within new patterns of organization and indirect control.

## **IV. From Message Uniformity to Structural Uniformity**

AR should not be seen as a mere tool for dismantling uniform media messaging; rather, it represents a shift from message uniformity to structural uniformity. Despite the apparent diversity of AR experiences, they remain governed by unified platforms, algorithms, and interaction models, establishing a shared cognitive framework. This shift exemplifies one of the most significant dimensions of the Third Wave highlighted by Toffler: the transfer of authority from visible institutions to invisible technical structures.

### ***Immersive Participation and Reconfiguring the Audience-Content Relationship***

AR fundamentally transforms the relationship between the audience and content, aligning with Third Wave principles of knowledge democratization and liberation from hierarchical media reception:

- a) Turning the audience into active participants: AR allows users to interact with content, explore data, and control the course of their experience, dissolving the old boundaries between sender and receiver and making the media process a circular exchange of information.
- b) Enhancing the sense of presence: Augmented presence creates a deeper cognitive experience, enabling users to feel inside the event rather than merely observing it. This type of presence embodies the shift from linear media to interactive, immersive media.
- c) Modifying reality perception: Through visual and informational layers, AR reshapes audience perception of events by linking them to other knowledge contexts. This transformation exemplifies the “multi-layered reality” characteristic of the information society described by the Third Wave.

Thus, the Third Wave manifests in AR not by promising absolute freedom or unlimited multiplicity, but by deeply restructuring the logic of media itself: converting the message into an experience, time into an interactive moment, space into a semantic medium, and the audience into a cognitive actor within a complex system, turning immersion into a rich, multi-dimensional experience. In this sense, AR is one of the most compelling expressions of Third Wave thought, representing a post-industrial stage that reshapes authority, knowledge, and media experience without eliminating the principles of control or structural coherence.

### ***Information Society and Its Impact on Media***

In *The Third Wave*, Alvin Toffler discusses the fragmentation of media as part of the broader transformations accompanying the shift from industrial society to a post-industrial, information-based society. His central argument is that the media is no longer centralized and hierarchical as it was in the industrial era, when channels were few and large, such as national newspapers, radio, and television. Media has now become fragmented, diversified, more specialized, and interactive. Toffler describes how mass media, which once addressed a broad audience with uniform messages, began to collapse. Audiences no longer consume media homogeneously; instead, they can choose what content to follow from an increasingly diverse and specialized media landscape.

In the Third Wave, media and communication channels have multiplied: specialized newspapers, magazines, satellite television, local radio, the Internet, and digital content. This proliferation fragments informational and media messages, giving audiences greater agency in selecting what they read or watch. Media is no longer confined to newspapers or television; it extends to smart, information-rich environments that allow users to exchange news and content directly. In other words, audiences themselves become part of the media production process—a phenomenon Toffler describes with the emergence of the prosumer, in which the line between producer and consumer dissolves. This shift profoundly affects power and knowledge. The fragmentation of media alters the traditional authority of information: major media institutions are no longer the sole sources of facts or news. Information power is thus distributed across multiple layers of society, increasing the complexity of oversight and guidance.

## Conclusion

This article concludes that augmented reality, as a new narrative medium, embodies Third Wave logic in media production across structural, narrative, and communicative dimensions. AR contributes to dismantling linear media models, enhancing interactivity, redistributing roles between producer and audience, and transcending traditional boundaries between reality and representation. These findings open new avenues for future research on immersive media, including semiotic analyses of immersive narratives, studies on the social and psychological impact of immersion as a new reality, and explorations of interactive reception, ethical considerations, and cognitive dimensions of AR technologies in journalism and media.

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