

Immersive Journalism

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ABSTRACT

The advent of immersive technologies, particularly virtual reality (VR), augmented reality (AR), and mixed reality (MR), has significantly transformed the landscape of journalism. Immersive technologies represent a profound evolution in journalistic storytelling. They have emerged as transformative forces in contemporary journalism, promising to redefine how news is produced, distributed, and experienced. Immersive journalism is a form of journalism production that allows first person experience of the events or situations described in news reports and documentary film. It offers a transformative approach to storytelling by creating deeply engaging news experiences. Immersive journalism enhances the sense of presence-the feeling of “being there.” By accessing a virtual version of the location where the story is occurring as a witness/participant, or by experiencing the perspective of a character depicted in the news story, the audience could be afforded unprecedented access to the sights and sounds, and even the feelings and emotions, which accompany the news. This paper explores immersive technologies and their potential transformative impact on modern journalism practices.

KEYWORDS: *virtual reality, VR, augmented reality, AR, mixed reality, MR, extended reality, XR, immersive technologies, journalism, journalists, immersive journalism news, news media.*

INTRODUCTION

Journalism is a constant presence in our lives, shaping how we understand the problems of the world. Today, journalism reaches audiences through many formats, including articles, video reports, podcasts, and live broadcasts. Journalism in itself has grown and undergone several transformations. It has always been driven by the desire to “conquer time and space” and transport audiences to the heart of the story. The fundamental goal has always been to transport the audience to the scene of an event, fostering understanding and awareness. In recent years, this fundamental goal has found new expression through the advent of immersive journalism. Immersive journalism involves the production of news in a form that allows people to gain first-person experiences of the events or situations described. It presents a powerful tool to bridge the gap between distant news events and the audience's lived experience. It utilizes technologies such as virtual reality (VR), augmented reality (AR), and mixed reality (MR). Immersive

journalism is rapidly emerging as a transformative force in the media landscape [1]. While traditional reporting relies heavily on text, audio, and video, immersive journalism places audiences within the story's environment. Evangelists of immersive medium maintain that the technology offers a revealing new experience that allows us to live the lives of others, literally to put ourselves into another person's shoes.

In an era characterized by a fragmented and viral media ecosystem, traditional journalism faces the daunting challenge of retaining audience attention and trust. Immersive journalism does not seek to replace traditional reporting but rather to complement and enhance it. It is a revolutionary approach to storytelling that is changing the way we experience and interact with news and information. It is a form of storytelling that uses immersive technologies to transport audiences into the heart of a story. It empowers journalists to be more creative, offering

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new tools to solve storytelling problems and providing a greater sense of veracity and transparency. It has the potential to democratize storytelling and increase the diversity of voices in the media. By offering a “sense of place,” journalists can provide context that text or standard video alone cannot achieve, thereby adding new value to the news [2]. Figure 1 shows a representation of immersive technology [3].

WHAT ARE IMMERSIVE TECHNOLOGIES?

The first step in understanding how to use immersive technologies is to learn the differences between various forms. In their simplest form, immersive technologies consist in adding virtual objects to the real world. There are four types of digital realities leading to different types of immersive technologies [4,5]:

- *Augmented reality* (AR)— designed to add digital elements over real-world views with limited interaction.
- *Virtual reality* (VR)— immersive experiences helping to isolate users from the real world, usually via a headset device and headphones designed for such activities.
- *Mixed reality* (MR)— combining AR and VR elements so that digital objects can interact with the real world means businesses can design elements anchored within a real environment.
- *Extended reality* (XR)— covering all types of technologies that enhance our senses, including the three types previously mentioned.

These devices also enable new user interactions including spatially tracked 3D controllers, voice inputs, gaze tracking, and hand gesture controls.

Extended reality (XR) is the overarching term used to describe employing technology to blend real life and the digital world. It includes all the machine-human interfaces beyond the physical realm (reality) such as augmented reality (AR), mixed reality (MR), assisted reality (aR), and virtual reality (VR), as illustrated in Figure 2 [6]. Figure 3 shows the XR spectrum [7]. Immersive technologies reside along a continuous scale ranging between the completely real and the completely virtual world. At one end, the real environment refers to the actual physical space, objects, and people that exist in the tangible world around us. At the other end, the virtual environment represents a completely computer-generated and immersive digital space, distinct from the physical reality. The space in the middle is called mixed reality, which is a blend of the real and virtual environments, where digital and physical elements

coexist and interact in real time. A range of devices makes up XR, and these are used by consumers and in many industries for entertainment, safety, training, or productivity purposes.

1. *VIRTUAL REALITY*: Virtual reality (VR) is XR at its most extreme. It completely immerses the user in a digital world, often using a computer-generated environment with scenes and objects that appear to be real. The term “virtual reality” essentially means “near-reality.” Virtual reality is the key technology for experiencing sensations of sight, hearing, and touch of the past, present, and future. VR is a fully immersive technology where users wear a head-mounted display and experience a simulated world of imagery and sounds. VR enables active learning. The terms, “virtual reality” and “cyberspace” are often used interchangeably. A cyberspace may be regarded as a networked virtual reality. A person using virtual reality can look around an artificial world, move around it, and interact with virtual features or items. This effect is commonly created by virtual reality headsets. Head-mounted displays immerse the user in a virtual environment. Virtual reality is a simulated experience that can be similar to or different from the real world. It is a computer-generated, 3D environment that completely immerses the senses of sight, sound, and touch. The complete immersion of the senses overwhelms users engrossing them in the action. Virtual reality technology includes multiple components divided into two main groups: hardware and software components [8].

➤ *Hardware Components*: The hardware components include a computer workstation, sensory displays, a tracking system, wearable devices, and input devices. Sensory displays are used to display the simulated virtual worlds to the user. The most common type is the head-mounted displays (HMDs), which is used in combination with tracking systems. Head-mounted display is shown in Figure 4 [9]. Users interact with the simulated environment through some wearable devices. VR depends on special responses such as raising hands, turning the head, or swinging the body. A wearable device is important in making these effects realistic. Special input devices are required to interact with the virtual world. These include the 3D mouse, the wired glove, motion controllers, and optical tracking sensors. These devices are used to stimulate our senses together to create the illusion of reality.

➤ *Software Components*: Besides the hardware, the underlying software plays an important role. It is

responsible for the managing of I/O devices and time-critical applications. The software components are 3D modeling software, 2D graphics software, digital sound editing software, and VR simulation software. VR technology has been designed to ensure visual comfort and ergonomic usage.

2. **AUGMENTED REALITY:** Augmented reality (AR) is a technology that combines real-world environments with computer-generated information such as images, text, videos, animations, and sound. It can record and analyze the environment in real-time. In augmented reality, the user typically experiences the real world through a device such as a smartphone, tablet, smart glasses, or head-mounted display. For example, AR allows consumers to visualize a product in more detail before they purchase it. This feature enhances consumer interaction and helps them never to repurchase the wrong item. The key objective of AR is to bring computer-generated objects into the real world and allows the user only to see them. In other words, we use AR to track the position and orientation of the user's head to enhance/augment their perception of the world. Augmented reality falls into two categories: 2D information overlays and 3D presentations, like those used with games. AR blends the virtual and real worlds by overlaying digital objects and information onto the users' view of the physical world.

To obtain a sufficiently accurate representation of reality, AR needs the following five components [10]:

- **Sensors:** AR needs suitable sensors in the environment and possibly on a user, including fine-grained geolocation and image recognition. These are activating elements that trigger the display of virtual information.
- **Image augmentation:** This requires techniques such as image processing and face recognition.
- **Head-mounted Display:** HMDs are used to view the augmented world where the virtual computer-generated information is properly aligned with the real world. Display technologies are of two types: video display and optical see-through display.
- **User Interface:** This includes technologies for input modalities that include gaze tracking, touch, and gesture. AR is a user interface technology in which a camera-recorded view of the real world is augmented with computer-generated content such as graphics, animations, and 2D or 3D models.
- **Information infrastructure:** AR requires significant computing and communications

infrastructure undergirding all these technologies. The infrastructure determines what real-world components to augment, with what, and when.

3. **MIXED REALITY:** Mixed reality (MR) is a term used to describe the merging of a real-world environment and a computer-generated one. Physical and virtual objects may co-exist in mixed reality environments and interact in real time. This is an extension of AR that allows real and virtual elements to interact in an environment. MR liberates us from screen-bound experiences by offering instinctual interactions with data in our living spaces and with our friends. Online explorers, in hundreds of millions around the world, have experienced mixed reality through their handheld devices. Mixed reality is a blend of physical and digital worlds, unlocking natural and intuitive 3D human, computer, and environmental interactions, as shown in Figure 5 [11] and Figure 6 [12]. This new reality is based on advancements in computer vision, graphical processing, display technologies, input systems, and cloud computing. Mixed reality has been used in applications across fields including design, education, entertainment, military training, healthcare, product content management, and human-in-the-loop operation of robots [13].
4. **ASSISTED REALITY:** Like mixed reality, assisted reality (aR) is an extension of augmented reality, with a few notable differences to both. One of these differences is that aR is primarily hands-free through the wearing of a headset, whereas AR usually requires the holding of a device such as a mobile phone. While MR is a digital-first, real-world second reality, aR is a real-world first system. It combines software and a head-mounted display. It is best experienced using smart glasses or other wearable technology. The aR market is growing rapidly and promises to be the next great leap to boost workers' productivity. A worker wearing an aR device is shown in Figure 7 [14].
5. **EXTENDED REALITY:** The term "extended reality" (XR) has recently gained favor as an umbrella term that encompasses all of AR, VR, and MR. The primary user inputs for XR devices are described as follows. Voice interfaces are now ubiquitous thanks to mobile devices and standalone smart speakers. Apple's Siri, Amazon's Alexa, Google's Assistant, and Microsoft's Cortana are all voice-driven software interfaces that are continuously gaining new capabilities. Many XR devices enable user control with handheld controllers, which have capabilities beyond button press inputs. Both voice-driven

interfaces and human-computer interactions have been developed specifically for XR devices, including gaze and gesture controls [15]. Figure 8 compares conventional computing with extended reality [15].

IMMERSIVE JOURNALISM

The rapid evolution of immersive technologies—including virtual reality (VR), augmented reality (AR), and mixed reality (MR)—has introduced a paradigm shift in journalism. Unlike traditional journalism, which relies on the passive consumption of news through text, images, or video, immersive journalism aims to place the audience within the story, providing a first-person perspective that can enhance understanding and empathy. By leveraging VR, AR, and MR, journalists can transport audiences to the center of the story, fostering unparalleled levels of empathy and engagement. By transitioning audiences from passive observers to active participants, immersive journalism offers unprecedented opportunities for storytelling, audience engagement, and the cultivation of empathy. Immersive journalism seeks to transform audiences from passive consumers into active participants. Figure 9 illustrates immersive journalism in the historical evolution of journalism [16].

The concept of immersive journalism was first coined in 2010 and formally articulated by documentary journalist and researcher Nonny de la Peña, who defined it as “the production of news in a form in which people can gain first-person experiences of the events or situation described in news stories.” The subsequent development of accessible consumer VR headsets, such as the Oculus Rift and Google Cardboard, accelerated the adoption of immersive formats by major news organizations [1]. Essentially any smartphone can be converted into a VR device at a cost of several dollars.

APPLICATIONS OF IMMERSIVE JOURNALISM

Immersive journalism is a groundbreaking approach to storytelling and news reporting that employs immersive technologies to place audiences directly within the narrative environment of news events. It has a range of applications in news reporting, documentary filmmaking, innovative journalism, interactive storytelling, and journalism education. Common applications of immersive journalism include the following [1,17-20]:

➤ *Innovative Journalism:* Immersive journalism is an innovative form of journalism, which transforms the relationship between news consumers and content by creating first-person experiences of news stories. It also transforms the

relationship between news content and consumer by enabling participants to gain a visceral understanding of events through spatial and sensory immersion. The methodology combines traditional journalistic principles of accuracy, fairness, and ethical reporting with advanced digital technologies to create three-dimensional, interactive environments where users can experience news stories from multiple perspectives. It constructs news experiences that engage multiple senses and create a profound sense of presence within the reported story. This approach has proven particularly effective in covering complex social issues, humanitarian crises, and environmental stories where traditional media might struggle to convey the full emotional and contextual depth of the situation.

➤ *Environmental Journalism:* Environmental journalism has leveraged VR to make the abstract threat of climate change visceral. The concept of presence in VR applications typically includes the ability of the audience to take actions within the virtual environment model, which in turn responds to the interactivity with perceptual and sometimes physiological feedback

➤ *Journalism Education:* Immersive technology has the potential to drastically alter journalism education. Students may connect with news stories and journalistic techniques in ways that are not possible with traditional approaches. Thanks to immersive technology’s immersive and engaging experiences. Immersive technology has the power to fundamentally change journalism education. By offering immersive, experiential learning opportunities that enhance students’ comprehension of journalistic processes, storytelling strategies, and ethical issues, immersive technology has great promise to transform journalism education. Immersive technology may improve learning by providing fresh viewpoints on narrative, encouraging interest in current affairs, and mimicking actual journalistic techniques. Difficulties of incorporating immersive technology into journalism include issues with cost, accessibility, and technological constraints. Students may practice with cutting-edge news production techniques in immersive technology in addition to learning how to cover stories.

➤ *Data Visualization:* While VR isolates the user from their physical surroundings, augmented reality (AR) overlays digital information onto the real world. AR is increasingly utilized for data journalism, explanatory reporting, and interactive

storytelling. The New York Times has been a pioneer in AR journalism, utilizing the technology to bring complex spatial data and 3D models into readers' living rooms.

- *Empathy*: Immersive journalism is claimed to be a more emotional all-encompassing medium allowing for a deeper understanding of the world. Despite the enthusiasm, the “empathy machine” rhetoric has faced significant scrutiny from scholars and ethicists. Research indicates that the correlation between VR exposure and long-term increases in empathy or prosocial behavior is inconclusive. “Empathic media” refer to technologies that track bodies and react to emotions and intentions and include for example, facial coding, voice analytics, VR, augmented reality, and wearables. Critics argue that empathy is complex and subject to implicit biases; placing a privileged viewer in a simulated environment of suffering does not inherently equate to understanding the lived reality of marginalized individuals. Empathy has been used as part of public discourse in promoting action and social change by world news organizations such as *The New York Times* and *The Guardian*. The focus on empathy limits the content production of immersive journalism and this can be diversified by creating experiences that focus on place rather than generating empathy for a specific person.

BENEFITS

One of the most frequently cited benefits of immersive journalism is its ability to generate empathy. By shifting audiences from passive consumers to active participants, immersive journalism offers profound benefits in terms of audience engagement, empathy generation, and information retention. The integration of immersive technologies offers a strategic advantage for news organizations seeking to innovate and attract new audiences. Other benefits of immersive journalism include the following [1,9,18]:

- *Personalization*: The demand for personalization plays a critical role in the rise of immersive journalism. As audiences expect content that is tailored to their interests and preferences, immersive journalism provides a unique opportunity to create personalized experiences. For example, AR in sports journalism can overlay real-time statistics, player insights, and historical data, allowing viewers to engage with the game in a way that feels customized to their interests. Similarly, VR experiences can be designed to guide users through different aspects of a story, allowing them to choose their path and explore

topics that resonate with them most. This personalized engagement enhances the viewer's sense of connection to the story, making it not only more immersive but also more relevant to their individual perspectives.

- *Fostering Empathy*: One of the most frequently cited benefits of immersive journalism is its potential to act as an “empathy machine.” Traditional news formats often struggle to convey the visceral reality of distant or complex events, such as humanitarian crises or natural disasters. Immersive technologies bridge this gap by simulating first-hand experiences, allowing audiences to “walk in another's shoes.”
- *Enhancing Audience Engagement*: Well-crafted journalism always aims to elicit a connection between the audience and the news story. Emotional resonance is a powerful driver of audience engagement and understanding. Emotional engagement has emerged as a significant factor influencing the acceptance of immersive journalism across all age groups. Immersive technologies significantly enhance audience engagement and information retention. In a media landscape saturated with fleeting social media updates, the immersive nature of VR and AR demands focused attention. Audiences are no longer mere spectators; they are active participants who can explore the environment and choose where to direct their gaze. This active participation has tangible benefits for comprehension. Augmented reality offers unique opportunities to enhance engagement by overlaying digital information onto the real world.
- *Information Retention*: Studies have found that experiencing news events firsthand through VR leads to better information retention compared to traditional 2D formats. By interacting with the content, users develop a more profound understanding of the magnitude and context of the information. AR can increase attention through novelty and presence, encourage active participation, and improve the understanding of complex data.
- *Revitalization*: The integration of immersive technologies offers a strategic advantage for news organizations seeking to innovate and attract new audiences.

Immersive journalism does not seek to replace traditional reporting but rather to complement and enhance it. It empowers journalists to be more creative, offering new tools to solve storytelling problems and providing a greater sense of veracity

and transparency. By offering a “sense of place,” journalists can provide context that text or standard video alone cannot achieve, thereby adding new value to the news.

- *Economic Landscape:* The economic landscape plays a significant role in the rise of immersive journalism. As immersive technologies become more commercially viable, large tech companies such as Meta, Microsoft, and Google are investing heavily in VR and AR development. The decreasing costs of VR/AR devices and the democratization of powerful content creation tools are lowering the financial barriers for smaller news organizations and independent journalists to experiment with immersive formats. This shift is contributing to the rapid expansion of immersive media.
- *Digital Natives:* From a societal standpoint, younger generations are driving the demand for more engaging, interactive content. As digital natives, they expect media to be more than just passive consumption; they want to engage with content in a way that is dynamic and participatory. This is where immersive journalism aligns with the Society component of DEGEST. Younger audiences, particularly Millennials and Generation Z, are increasingly turning to VR and AR experiences not just for entertainment, but also for learning and information. In particular, immersive journalism has proven effective in drawing attention to complex global issues, such as climate change, by allowing users to experience simulations of cities affected by rising sea levels or environmental degradation.

CHALLENGES

The integration of immersive technologies into the newsroom is not without its challenges, which must be carefully navigated. Challenges include high production cost, ethical manipulation, audience fragmentation, declining trust, narrative disorientation, economic fragility, structural inaccessibility, and the threat of immersive disinformation. Despite the initial enthusiasm, the integration of immersive journalism into daily newsroom operations has been dynamic but unsteady. Other challenges of immersive journalism include the following [1,18]:

- *Audience Accessibility:* The most profound barrier to the future of immersive journalism is audience access. Concerns about accessibility and inclusivity are significant, particularly among older and less technologically proficient participants. The accessibility challenge is not merely a domestic issue; it has profound

implications for global news coverage. The most compelling subjects of immersive journalism—refugee crises, conflict zones, environmental disasters—are disproportionately located in the Global South, yet the audiences with the hardware to experience these stories are concentrated in the Global North. This implies that the stories told through VR and AR are largely determined by the editorial priorities of Western news organizations, potentially marginalizing local perspectives and reinforcing existing patterns of media imperialism. Accessibility must be treated as a design principle rather than an afterthought.

- *High Cost:* Adherence to immersive journalism is not yet a reality in a large part of the media due to the high cost of production. The production of high-quality immersive journalism is substantially more expensive and time-consuming than conventional news reporting. Creating a compelling VR or AR news experience requires specialized cameras, software for stitching and post-production, and technical expertise in spatial audio and interactive design. For major news organizations with dedicated innovation teams and access to tech-company partnerships, these costs are manageable; for smaller regional outlets, community newspapers, or journalists in the Global South, they represent a prohibitive barrier to entry.
- *Ethical Concerns:* Ethical considerations refer to the use of violent, cruel, and pornographic materials or questions of authenticity, truthfulness, verification, and privacy. A primary ethical concern is the tension between denotation (representing reality “as is”) and connotation (representing it “as if”). The profound psychological impact of immersive journalism introduces novel ethical dilemmas that extend beyond the traditional concerns of visual journalism. When a medium has the power to induce strong emotional distress or alter real-world behavior, the ethical responsibilities of the journalist are magnified. As journalism transitions from the screen to the headset, traditional ethical frameworks—built around objectivity, accuracy, and transparency—must be adapted for synthetic environments. For immersive journalism to be ethical, the tools of fabrication should be visible to the viewer.
- *Transparency:* Transparency must be treated as a non-negotiable standard. Audiences must be clearly informed about the production methods used to create an immersive experience, including the extent to which scenes have been

reconstructed, staged, or digitally altered. This transparency is not merely a matter of professional ethics; it is a prerequisite for maintaining public trust in journalism as an institution. The verification of immersive content presents unique challenges that existing journalistic standards and ethical codes are ill-equipped to address. In traditional photojournalism, the norms against image manipulation are well-established, even if they are not always observed. In immersive journalism, the very process of production involves a series of choices that have no clear analogue in existing ethics frameworks.

- *Trust:* Trust in media and perceived realism are critical factors in determining whether audiences embrace new formats. Immersive journalism can potentially bridge the trust gap in traditional media. Concerns about the ethical implications of such deep emotional engagement emphasize the need for responsible journalism practices. Those who trust the media and perceive the immersive content as realistic are more likely to accept and engage with immersive journalism. The perceived realism and emotional impact of immersive journalism play a crucial role in influencing the trust and engagement of younger audiences.
- *Credibility:* The relationship between immersion and credibility is complex. While VR can enhance the feeling of being present, relying on overly flashy or gamified design elements can diminish trustworthiness. What really makes people trust VR more is that it creates a greater sense of realism compared to text and that creates the trustworthiness. But, if it does not give that sense of realism, it can affect credibility. Thus, for immersive journalism to be effective, it must balance the emotional pull of presence with the journalistic imperative of factual realism.
- *Psychological Harm:* Journalism has long been governed by norms of accuracy, fairness, and the minimization of harm. The psychological wellbeing of audiences must be explicitly considered in the design and distribution of immersive content. There is the potential for VR to cause distress, disorientation, or lasting behavioral change. True VR poses unique risks related to behavioral manipulation. Because immersive journalism aims to elicit deep emotional responses, there is a risk of causing psychological harm or trauma to the audience, particularly when covering violent conflicts or human rights abuses. The visceral nature of VR raises the ethical principle of “do no harm” to a

new level. If VR is effective because it tricks the brain into feeling present, exposing audiences to virtual war zones, solitary confinement, or traumatic events carries the risk of psychological distress. Journalists must carefully balance the desire to inform and engage with the responsibility to protect their audience from virtual trauma.

- *Cybersickness:* The term “cybersickness” has also been used in relation to immersive journalism. During an immersive experience, the body misinterprets the stimuli as a form of toxic substance. VR experiences have an impact on people and their psychology and can encourage empathetic understanding. So, in immersive journalism, it is important to avoid any motion sickness effects.
- *Audience Safety:* Journalists must start placing the rights and safety of audiences at the center. In immersive journalism, there is a clear breach of existing audio and visual ethical guidelines when it comes to practices in immersive journalism.
- *Digital Divide:* The promise of immersive journalism as a democratizing force in news consumption is undermined by the significant hardware requirements of the technology. These requirements place immersive journalism beyond the reach of large segments of the global population. This suggests that the medium's most powerful capabilities are accessible only to a minority of users. If immersive journalism becomes a primary vehicle for high-quality, emotionally resonant storytelling, the failure to address the access barriers risks creating a two-tiered information environment in which the most powerful news experiences are available only to the privileged few. High-end VR headsets remain expensive, and the bandwidth required for seamless streaming is not universally available. This exacerbates the digital divide, creating a scenario where premium, highly engaging journalistic experiences are only available to affluent demographics.

FUTURE OF IMMERSIVE JOURNALISM

The field of immersive journalism is constantly evolving, with new technologies and innovations emerging all the time. It is transforming the way we experience and interact with news and information. The future of immersive journalism lies not in isolated technological gimmicks, but in the thoughtful integration of immersive elements into the broader narrative strategies of the newsroom. It will be determined not by the sophistication of the hardware or the realism of the graphics, but by the integrity,

rigor, and democratic commitment of the journalists and institutions that wield these powerful tools. As production tools become more accessible and distribution channels more ubiquitous, immersive journalism has the potential to become a sustainable and vital medium for helping audiences understand and connect with the complexities of the modern world.

The future of immersive journalism will be shaped by several converging technological advancements that will make production cheaper, faster, and more interactive. This future is contingent upon the industry's ability to navigate significant ethical and structural challenges. Improvements in VR and AR technology could enable more sophisticated and immersive experiences, further enhancing the potential of immersive journalism. As immersive journalism becomes more sophisticated, it introduces novel ethical dilemmas that challenge traditional journalistic norms of objectivity, accuracy, and transparency. The challenge for the future is developing new ethical guidelines that differentiate between legitimate "reconstruction" for the sake of spatial understanding and deceptive "fabrication" [1].

CONCLUSION

Immersive technologies represent a paradigm shift in journalism, offering unparalleled opportunities to engage audiences, foster empathy, and enhance the comprehension of complex narratives. They represent a significant evolution in the toolkit of journalism. Immersive journalism has emerged as a groundbreaking approach in the field of media, leveraging advanced technologies like virtual reality (VR) and augmented reality (AR) to create deeply engaging and emotionally resonant news experiences.

Immersive journalism is now entering a new phase of maturity. It has been regarded as one of the most significant innovations in journalism in the past decade because of its potential to create deeper engagement with audiences through digital storytelling and creating first-person perspectives. Its capacity to transport audiences into the heart of a news event, to foster empathy across cultural and geographic distances, and to make the abstract viscerally real is genuinely unprecedented. However, realizing the full potential of immersive journalism requires a careful balance between technological innovation and ethical responsibility. For immersive journalism to gain widespread acceptance, media organizations must address technological barriers, enhance user education, and ensure ethical standards in storytelling [21].

News organizations that prioritize innovation and adaptability are more likely to integrate immersive

journalism into their practices. Major news organizations have heavily invested in this medium. The success of immersive journalism will depend not solely on the novelty of the technology, but on its thoughtful application in service of truth, accuracy, and ethical storytelling. Major outlets, including The New York Times, BBC, and National Geographic, have heavily invested in VR and 360-degree video to differentiate their content and strengthen relationships with their audience. More information about immersive journalism can be found in the books [17,22-28] and the following related journals:

- Journalism
- Journalism and Media

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Figure 1 A representation of immersive technology [3].

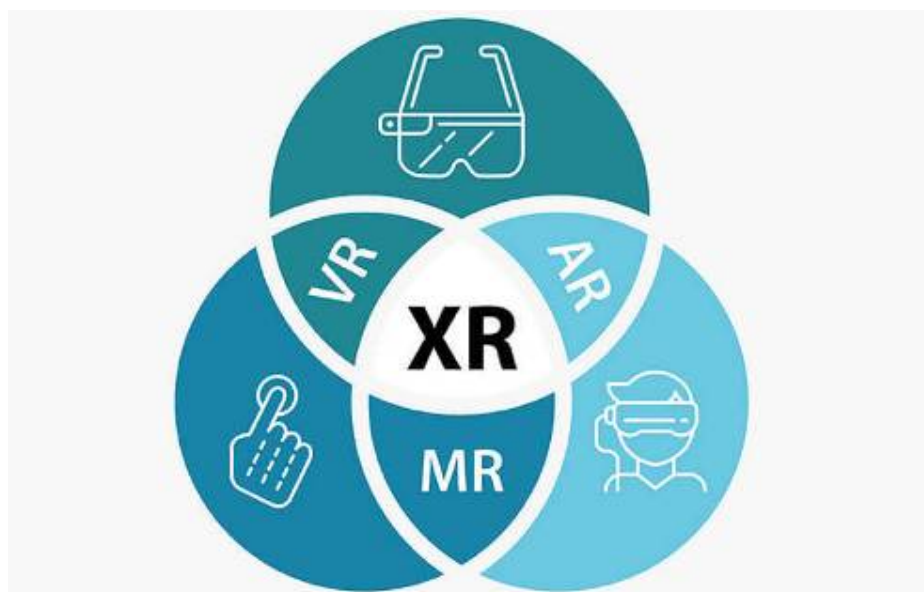


Figure 2 Extended reality (XR) includes AR, MR, and VR [6].

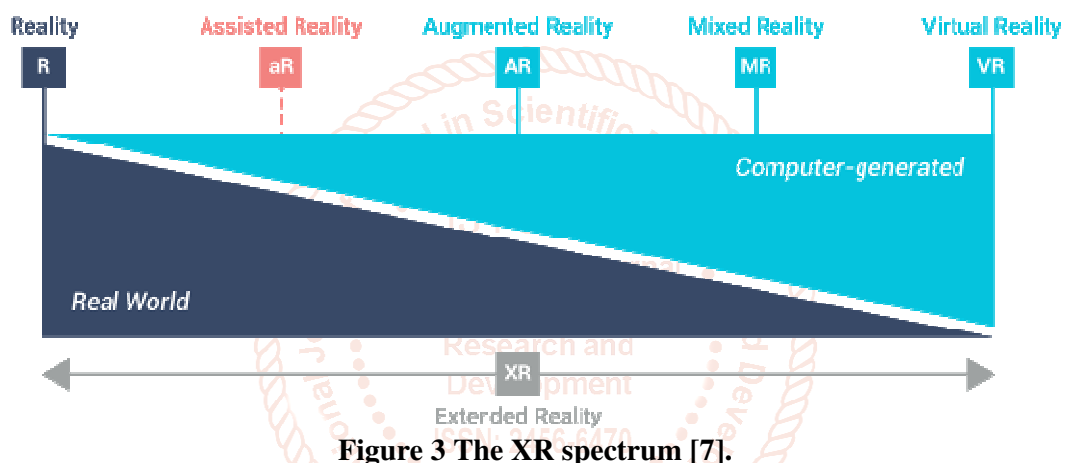


Figure 3 The XR spectrum [7].



Figure 4 Head-mounted display [9].

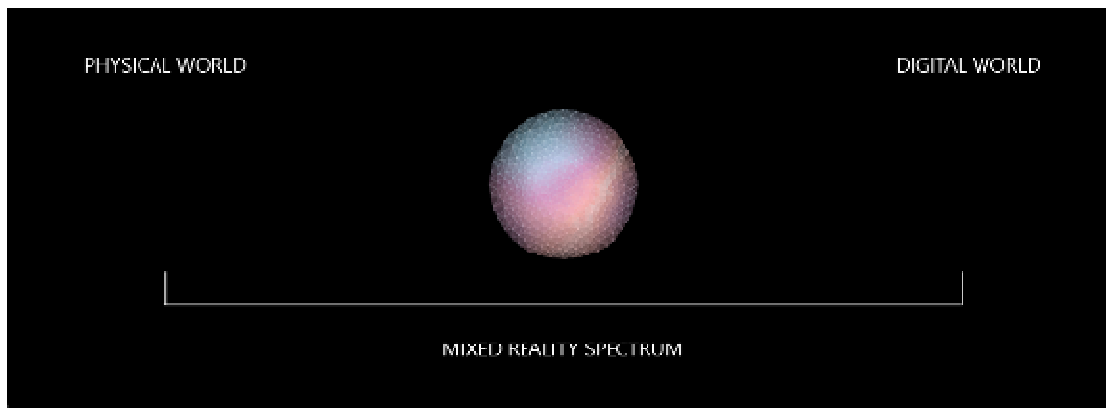


Figure 5 Mixed reality is a blend of physical and digital worlds [11].

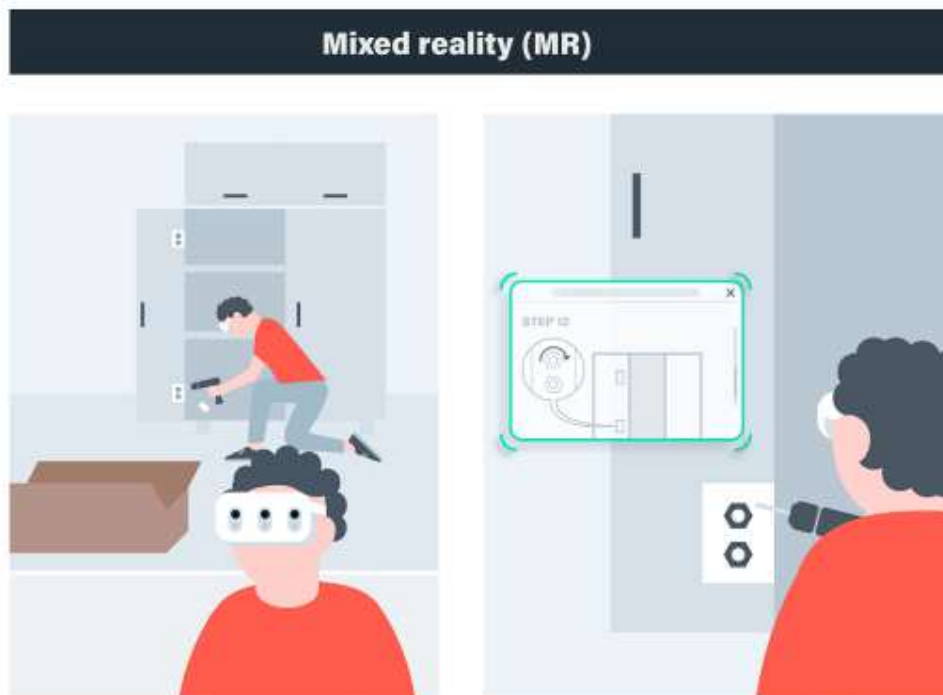


Figure 6 Mixed reality [12].



Figure 7 A worker wearing an assisted reality device [14].

Conventional Computing



Extended Reality (XR)

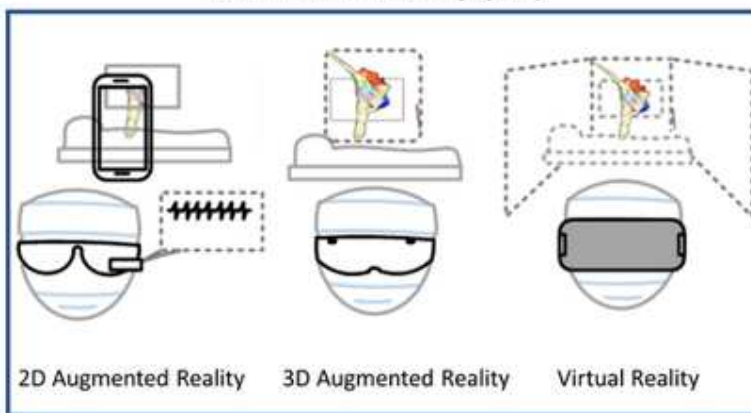


Figure 8 Comparing conventional computing with extended reality [15].



Figure 9 Immersive journalism in the historical evolution of journalism [16].