

DESIGNING 360-DEGREE VIDEO-BASED JOURNALISTIC CONTENT: AN ANALYSIS OF NEEDS AND CHALLENGES

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Abstract

Digital transformation is driving mass media to adopt more interactive news formats, one of which is immersive journalism based on 360° video. This study aims to analyze the needs and challenges of developing 360° journalistic content by linking three theoretical foundations—affordance, presence, and journalistic ethics—to formulate an effective design approach. The method used is the 4D R&D model (Define, Design, Develop, Disseminate) with a mixed approach: a questionnaire to map public interest and perception, a literature review to map the latest technical ethical findings, and in-depth interviews with journalists to understand industry needs, production constraints, and technology adoption strategies. The results show a growing demand for 360° content; journalists consider this format to open up opportunities for richer and more empathetic storytelling, while 85% of audience respondents expressed interest in trying/watching 360° content due to the more immersive experience and navigation control. However, significant barriers include device and training costs, post-production complexity, reliance on network infrastructure, adoption challenges for older users (approximately 30% report dizziness/difficulty wearing VR headsets), and ethical risks associated with potential emotional manipulation. This study proposes a 360° prototype design framework that integrates affordance (free navigation, rotation, and visual focus), presence enhancement for cognitive empathy, and ethical guidelines (transparency of source, context, and privacy). Practical implications include the need for technical training, funding support, and cross-platform dissemination strategies for more inclusive adoption.

Keywords: journalistic, journalistic Content, 360 degree video

Abstrak

Transformasi digital mendorong media massa untuk mengadopsi format berita yang lebih interaktif, salah satunya adalah jurnalisme imersif berbasis video 360°. Penelitian ini bertujuan untuk menganalisis kebutuhan dan tantangan dalam mengembangkan konten jurnalistik 360° dengan mengaitkan tiga landasan teoretis—affordance, presence, dan etika jurnalistik—untuk merumuskan pendekatan desain yang efektif. Metode yang digunakan adalah model 4D R&D (Define, Design, Develop, Disseminate) dengan pendekatan campuran: kuesioner untuk memetakan minat dan persepsi publik, tinjauan pustaka untuk memetakan temuan teknis dan etika terkini, serta wawancara mendalam dengan jurnalis untuk memahami kebutuhan industri, kendala produksi, dan strategi

adopsi teknologi. Hasil penelitian menunjukkan adanya permintaan yang terus meningkat terhadap konten 360°; para jurnalis menganggap format ini membuka peluang untuk penceritaan yang lebih kaya dan penuh empati, sementara 85% responden audiens menyatakan minat untuk mencoba/menonton konten 360° karena pengalaman yang lebih imersif dan kontrol navigasi yang lebih baik. Namun, hambatan signifikan meliputi biaya perangkat dan pelatihan, kompleksitas pascaproduksi, ketergantungan pada infrastruktur jaringan, tantangan adopsi bagi pengguna lanjut usia (sekitar 30% melaporkan pusing/kesulitan saat memakai headset VR), serta risiko etis yang terkait dengan potensi manipulasi emosional. Studi ini mengusulkan kerangka kerja desain prototipe 360° yang mengintegrasikan affordance (navigasi bebas, rotasi, dan fokus visual), peningkatan kehadiran untuk empati kognitif, serta pedoman etika (transparansi sumber, konteks, dan privasi). Implikasi praktisnya mencakup kebutuhan akan pelatihan teknis, dukungan pendanaan, dan strategi penyebaran lintas platform untuk adopsi yang lebih inklusif.

Kata kunci: *jurnalistik, Konten jurnalistik, video 360 derajat*

INTRODUCTION

The development of information and communication technology has fundamentally changed the way humans produce, disseminate, and consume information. The rapid digital transformation has forced mass media to adapt to meet the expectations of an increasingly savvy audience accustomed to digital interactions. In recent years, traditional media outlets such as television and newspapers have seen declining audiences, while digital platforms and social media continue to grow rapidly. This trend has pushed media outlets to seek more engaging and relevant news formats to meet the needs of the digital generation. One promising innovation is immersive journalism, utilizing 360-degree (360°) video technology. This technology provides an experience that allows audiences not only to watch the news but also to experience it firsthand, feeling as if they were there. Rapid digital transformation is forcing mass media to adapt to meet the expectations of an increasingly digitally literate audience (Hernández-Rodríguez, 2024)

Traditional media outlets such as television and newspapers are experiencing declining audiences, while digital platforms and social media continue to grow rapidly (Cheng, 2025). This trend is driving media outlets to present more engaging and relevant news formats for the digital generation. One promising innovation is immersive journalism based on 360° video (Kunert, 2024).

According to Eskiadi (2024), 360° video bridges the gap between passive news consumption and participatory experiences that emphasize interactivity. This format utilizes sensors, multi-lens cameras, and specialized software to produce panoramic visuals that can be accessed with smartphones or VR headsets. Viewers can choose their own viewing angle, zoom, or rotate the display making the news experience less linear and more exploratory (Loterio, 2023). Through this approach, viewers can choose their viewing angle, zoom in on details, or rotate their view in any direction. As a result, news is no longer presented in a linear fashion but provides the audience with a broader exploration space. Other research confirms that this powerful sense of presence has the

potential to enhance audience understanding of news events and foster greater emotional engagement (de la Peña et al., 2010; Amrhein, 2024).

However, this immersive power also carries ethical risks. Mandela (2024) warned that this technology could be used to manipulate emotions or construct overly dramatic narratives, thus obscuring the objectivity of news stories. Therefore, the development of 360° journalism must be accompanied by strict ethical guidelines, including transparency of news sources, explanation of context, and protection of the privacy of individuals featured (Sánchez Laws & Utne, 2019; Okocha & Akpe, 2024).

On the other hand, the use of advanced technology in journalism also poses a number of challenges that require careful consideration. One major issue is the high production costs, as it requires specialized camera equipment, technical editing skills, and adequate network infrastructure for high-quality content distribution. Furthermore, the widespread adoption of this technology still faces obstacles, especially for audiences unfamiliar with virtual reality devices or sensor-based technology. Another equally important challenge is ethical issues, such as the potential for manipulating audience emotions through dramatic visual settings and framing, which may compromise the objectivity of the news.

Herrera Damas (2022) emphasizes that while immersive journalism offers significant opportunities to enhance the quality of news presentation, this technology is still in its experimental stage and requires further research to overcome technical, ethical, and distribution barriers. It is in this context that this research becomes crucial: to analyze the needs and challenges faced in developing 360° journalistic content. The aim of this research is to formulate an effective approach to developing immersive content that is relevant to journalists' needs and audience preferences.

The theoretical foundation of this research encompasses two key concepts: immersive journalism and the affordances of 360° video. The term "immersive journalism" was first popularized by de la Peña et al. (2010) to describe the practice of presenting news using virtual reality (VR) and augmented reality (AR) technology, allowing audiences to experience news events directly in a virtual environment. This concept emphasizes the role of technology in creating immersive, emotional, and interactive experiences. In conventional journalism, audiences only receive information in a one-way format; however, immersive journalism provides a multi-sensory experience that makes viewers feel like they are part of the story.

Eskiadi (2024) states that 360° technology can bridge the gap between factual news and audience emotional engagement. This experience is not merely entertainment, but also has high educational and social value because it can build empathy for social or humanitarian issues. For example, coverage of conflicts, natural disasters, or environmental issues in 360° format can provide a richer perspective and motivate audiences to care. Furthermore, this technology also has the potential to improve media literacy by encouraging audiences to explore various perspectives independently.

The affordances of 360° video are a crucial element that distinguishes immersive journalism from traditional video formats. Affordance refers to technological features that

enable users to actively interact with the content. A study in *Perceptions of the Affordances of Journalistic 360° Video* (2024) found that affordances such as free navigation, camera rotation, and the ability to adjust the focus of the view give audiences complete control over their experience. The study stated: "Affordances in journalistic 360° video enhance feelings of presence, control, and authenticity, creating a stronger connection between the audience and the narrative." In other words, the greater the affordances provided, the higher the level of audience engagement.

Figure 1. 360 degree video based user visualization of journalistic content



In addition to affordances, presence theory is also an important foundation in 360° content design. Presence is defined as the feeling of being physically present in a virtual environment. According to Gallego Abellán (2024), strong presence can trigger cognitive empathy, which is an emotional understanding of the situation or event depicted. This makes immersive journalism an effective tool for communicating complex issues that are difficult to grasp through text or two-dimensional images.

However, this power of immersion also poses ethical risks. Mandela (2024) warns that this technology can be used to manipulate emotions or construct overly dramatic narratives, thus obscuring the objectivity of the news. Therefore, the development of 360° journalism must be accompanied by strict ethical guidelines, including transparency of news sources, explanation of context, and protection of the privacy rights of individuals featured. Based on this theoretical foundation, the research will utilize the concepts of affordance, presence, and journalistic ethics to design a prototype of 360° content. A thorough understanding of these theories will help researchers and journalists design immersive news experiences that remain accurate, fair, and trustworthy.

METHOD

To systematically design 360° journalistic content, this study employed a Research and Development (R&D) method with the 4D model, consisting of the Define, Design, Develop, and Disseminate stages. The 4D model is widely used in educational innovation development, but it can be adapted to journalism because it provides a clear framework for analyzing needs, designing solutions, testing prototypes, and disseminating the final product (Indaryanti et al., 2025). Indaryanti et al.'s study states: "The 4D model: Define, Design, Develop, and Disseminate is a widely recognized framework for research and

development, particularly in educational innovation," while highlighting the challenges of implementation outside the education sector due to the lack of cross-disciplinary empirical validation.

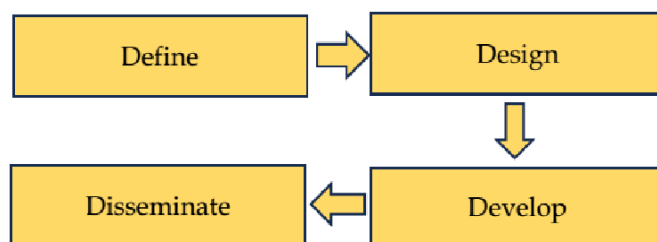
Define Stage. In this stage, researchers analyzed needs and problems from two perspectives: journalists as content creators and the public as audiences. Data was collected through questionnaires, literature reviews, and in-depth interviews. The primary focus was identifying technical challenges, storytelling opportunities, and user preferences for 360°-based news formats.

Design Phase. The design phase includes planning a prototype of 360° video content, including storyboards, camera setup, ambisonic sound, and user interactivity. The goal is to design a news experience that is not only informative, but also engaging and easy to use.

Development Phase. Development involves creating an initial prototype, which is then tested on a small group of journalists and audiences. The test results are used to evaluate the perception, comfort, and effectiveness of 360° content in delivering news.

Disseminate Phase. The final phase involves disseminating the final product and implementation guides to journalists and media organizations. The dissemination strategy also includes educating the public to better prepare them for adopting immersive technology.

Figure 2. 4D R&D Flow chart



This research used a combination of quantitative and qualitative methods. Questionnaires and questionnaires were used to measure public perception and interest in immersive journalistic content. A literature review was conducted to examine previous research findings, including technical challenges and ethical aspects. In-depth interviews with journalists helped researchers understand industry needs, production constraints, and technology adoption strategies. This combination of methods provides a comprehensive overview of the opportunities and obstacles in the development of 360° journalism.

RESULTS AND DISCUSSION

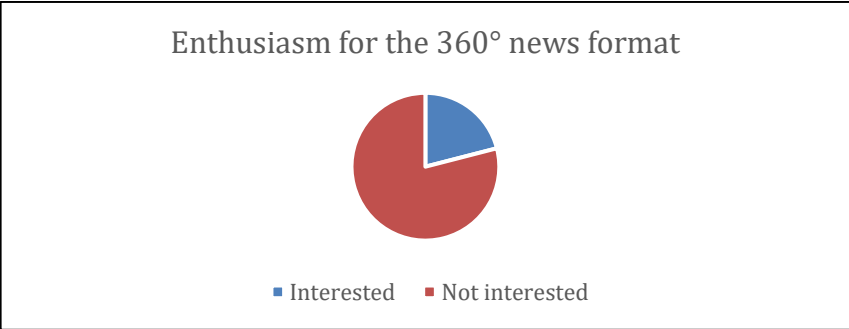
The results of this study indicate a growing demand for 360°-based journalistic content, both from the perspective of journalists and audiences. This immersive video technology is seen as adding value to news presentation by providing a more interactive and immersive experience for viewers. From the journalists' perspective, in-depth interviews with several media practitioners revealed that the majority of respondents viewed the 360° format not simply as a technological trend, but as a strategic opportunity to enrich storytelling. They stated that 360° video is able to present new perspectives and unique

viewpoints that conventional video cannot. Several issues, such as humanitarian conflict, the climate crisis, and natural disasters, are considered more effective in conveying through this medium because it can foster public empathy. One experienced journalist stated: "The 360° format allows us to present news with greater emotional depth. Viewers not only see the event, but also feel the atmosphere at the location, as if they were there in person."

However, the results of the study also highlighted the challenges journalists face in adopting this technology. Producing 360° video requires specialized equipment such as multi-lens cameras, high-spec editing software, and human resources with adequate technical skills. The post-production process becomes more complex because every angle of the image must be meticulously checked to avoid technical errors, such as image distortion or uneven transitions. Furthermore, cost is a significant obstacle, especially for small and medium-sized media organizations. Many editors report difficulty in securing the necessary budget for equipment investment and technical training. Therefore, journalists emphasize the need for structured technical training, easily accessible production guides, and financial support from external parties such as sponsors, government agencies, or non-profit organizations to ensure widespread adoption of this technology in the media industry.

From an audience perspective, questionnaire data collected indicates considerable enthusiasm for the 360° news format. Eighty-five percent of respondents expressed interest in trying or consuming news in this format. The main reasons cited include a more immersive viewing experience, the opportunity to independently explore various perspectives, and the ease of understanding the context of the news story due to the ability to directly see the background of the event. One respondent stated: "With 360° video, I feel like I'm at the scene. I can feel the atmosphere, hear the sounds of the surrounding environment, and notice small details that might be missed in conventional reporting." These findings underscore the significant potential of 360° technology in increasing audience engagement with news.

Figure 3. Diagram of public enthusiasm for the 360° news format



However, there are barriers to user experience. Around 30% of respondents aged 50 and over reported experiencing difficulty operating the device or experiencing dizziness when using a VR headset. This suggests that immersive content development must consider the comfort of users across generations. User-friendly interface design, visual quality adjustments, and education on how to safely enjoy content are crucial factors in

expanding the reach of this technology. Furthermore, integrating 360° video with popular digital platforms such as YouTube, Facebook, or online news sites can be a strategic step to facilitate audience access without the need for specialized devices.

Overall, this study confirms that 360° video has significant potential to transform news delivery and create a new, more participatory journalistic experience. For journalists, this technology opens up opportunities to explore more immersive storytelling formats, while for audiences, it empowers them to become part of the news coverage, rather than passive observers. However, successful implementation requires synergy between technology development, human resource investment, and an inclusive content distribution strategy. Mass media outlets are expected to rely not only on technical capabilities but also develop ethical and creative guidelines so that 360° video can be used to strengthen journalistic values, raise public awareness, and build social empathy. With the right ecosystem support, 360°-based journalistic technology has the potential to become a new standard for news presentation in the digital era, which increasingly prioritizes user experience.

DISCUSSION

A comprehensive literature analysis concludes that 360° video technology has tremendous potential to enhance audience understanding of complex issues, particularly those related to social, political, and humanitarian contexts. This technology allows viewers to experience the atmosphere of an event firsthand, resulting in a much richer experience than conventional video formats. In coverage of armed conflict, for example, 360° can provide authentic visualizations of locations, show environmental damage, and bring victims' faces into closer view. Gallego Abellán (2024) states that 360°-based visualizations can help build deep social empathy, as audiences can experience greater emotional involvement. However, this emotional power also poses serious ethical challenges. Mandela (2024) cautions that: "Immersive journalism carries the risk of emotional manipulation if not carefully managed, particularly in stories involving human suffering or trauma." This statement emphasizes that the use of immersive journalistic technology must not be separated from ethical oversight and strict journalistic codes of ethics.

The concept of affordance is key to the success of 360° video. Affordance refers to the ease with which technology allows users to intuitively interact with content. The study, "Perceptions of User Control in Immersive Journalism" (2024), revealed that the greater the level of control users have in selecting viewpoints and navigation during viewing, the greater their emotional engagement and trust in the news. This finding was also evident in a simple prototype trial conducted for this study, where the majority of audience respondents expressed satisfaction with the free navigation feature. This feature allows them to explore scenes at their own pace, rather than simply following the story line outlined by the editor. This greater sense of control, according to respondents, makes them feel closer to the truth of events, as they have the freedom to see details that might be missed in conventional reporting.

However, despite this promising potential, technical challenges remain major obstacles, particularly in distribution and accessibility. High-resolution 360° video requires

substantial bandwidth and a stable internet connection to ensure an uninterrupted viewing experience. In the survey, several respondents expressed frustration when video quality dropped or buffering disrupted the flow of the story. This demonstrates the need for innovation in video compression technology, such as the use of adaptive compression algorithms and the implementation of the latest network technologies like 5G to minimize technical glitches. Furthermore, device compatibility is a concern. Not all audiences have VR headsets or devices with high specifications to stream immersive videos. Therefore, distribution strategies need to consider cross-platform formats, such as playback on smartphones or computers with simple navigation controls. This challenge demonstrates that the success of immersive journalism is determined not only by the creativity and skills of journalists, but also by the readiness of global technological infrastructure.

The results of this study align with findings from a number of international literature. Herrera Damas (2022) emphasized that immersive journalism is still in the experimental stage and requires in-depth study to determine production, distribution, and ethical standards. A study by Gallego Abellán (2024) confirmed the potential of 360° technology in building social empathy, while Mandela (2024) emphasized the risk of misuse of this technology if not strictly regulated. The consistency of these findings demonstrates the urgent need for comprehensive immersive journalism production guidelines, including technical standards, data security protocols, and ethical guidelines for covering sensitive events. Thus, this research not only strengthens the existing literature but also makes a practical contribution by providing empirical data on audience perceptions, feature effectiveness, and technology implementation challenges.

Methodologically, the application of the 4D R&D model (Define, Design, Develop, Disseminate) proved effective in systematically designing and developing 360° video content prototypes. In the Define stage, the research successfully mapped journalists' and audiences' needs, while identifying technical and ethical challenges. Initial findings from this stage provided a strong foundation for prototype design. The Design stage then focused on developing coverage scenarios and designing user experience (UX) designs that took into account the principles of affordability and audience comfort. The Develop stage involved the production process.

CONCLUSION

Designing 360-degree journalistic content has significant potential to transform the way people consume news. This format provides an immersive experience that enhances audience comprehension, emotional engagement, and trust in the news. This research finding confirms that journalists are ready to adopt this technology, despite technical challenges and costs being barriers. Audiences have shown high interest in 360-degree content, although educational support is needed to overcome technological barriers. The 4D R&D model has proven relevant for designing this type of content, as it provides a systematic approach from needs analysis to dissemination. With the support of further research, technical training, and ethical guidelines, 360-degree journalism can be an innovative step in delivering more human, interactive, and meaningful news to future audiences.

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